



2021 FACTS AND FIGURES UNIVERSITY OF COLORADO SCHOOL OF MEDICINE

CELEBRATING 138 YEARS: 1883-2021



Top right photo courtesy of @uchealth Instagram, November 26, 2020.

Bottom left photo courtesy of @cumedschool Instagram, June 25, 2021: “In honor of [#PrideMonth](#), the [#LGBTQ+](#) Hub handed out CU Pride t-shirts outside of the Fitzsimons Building to support the LGBTQ+ community at [@CUAnschutz](#)”



Dean's Message

When vaccinations for COVID-19 began to be administered in late 2020 and became widely available last spring, we had hoped that we were leaving the pandemic behind us. That optimism was put into perspective this summer by a resurgence of cases caused by the Delta variant of the virus.

Through this continuing adversity, our School of Medicine community has shown determination and strength, and you will find many signs of that in this year's Facts and Figures book. Our researchers received record-setting grant support, our clinicians continued to provide the best care in our community, our educators ranked higher than ever, and our school attracted a record number of applicants.

The School of Medicine is focused on building programs that will be key to our future. We have recruited national leaders in bioinformatics and data analysis to establish a strong Center for Health AI and to stitch together the vast resources we have on this campus. Their work will contribute to breakthroughs in patient care, research, and education.

We have also recruited new chairs for the Department of Medicine and the Department of Family Medicine. Vineet Chopra, MD, MSc, our new chair of medicine, joined us from the University of Michigan, where he was the chief of hospital medicine. Myra Muramoto, MD, MPH, became our chair of family medicine after leading the University of Arizona College of Medicine's Department of Family and Community Medicine. Both bring accomplished records of research, clinical care, education, and administrative leadership.

We are moving forward on a plan to create the Aurora Community Health Commons, a major initiative that will bring outstanding clinical care to our neighbors. In partnership with Salud Family Health Centers, we are establishing a clinic that will provide primary and specialty clinical care to some of our neighbors who haven't had a medical home in the past. The Commons will also address social factors – jobs, education, food – that contribute to health inequities.

CU Medicine, our faculty clinical practice, remained strong, continuing to serve our patients with the highest-quality care. We have launched a marketing program, We CU, to boost the community's awareness of our faculty. The practice increased its support for scholarships for students in our medical, physical therapy, physician assistant, and anesthesiologist assistant programs.

Philanthropic support for the School of Medicine has increased too. Notably, the School of Medicine, in partnership with the Mile High Medical Society, announced the creation of the Charles J. Blackwood, MD, Endowed Memorial Scholarship to support Black and other underrepresented medical students. We are grateful for all our philanthropic partners for their valued partnership and shared investment in our programs and our future.

Our Office of Medical Education implemented an updated curriculum that offers a comprehensive renewal of commitment to training medical students. The Trek Curriculum will graduate physician leaders who can transform the health of diverse communities. The knowledge of scientific content will be better matched to meet the moment of care. Instead of learning in fragmented blocks, students will travel alongside patients and teachers on their journey for health and care.

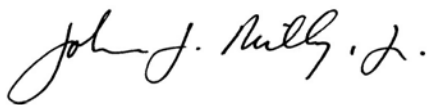
We opened a branch campus in Fort Collins, in partnership with Colorado State University. Twelve first-year medical students began classes that will be taught by CU and CSU faculty who have received appointments in our school. During the 2020-2021 academic year, 11 third-year students conducted their clinical training rotations in northern Colorado as we developed new preceptor relationships in the community.

The doctorate-granting bioscience training programs on the Anschutz Medical Campus transitioned from the Graduate School to the School of Medicine for purposes of supervision and administration. The transition also launched a phased-in increase in the number of graduate students admitted to the programs. Angie Ribera, PhD, chair of physiology and biophysics, has been named associate dean for research education.

Our faculty secured renewed federal funding support for the University of Colorado Cancer Center, and individual researchers in the head and neck cancer program secured a Specialized Program of Research Excellence from the National Cancer Institute. Faculty also received new federal grants to establish a new Diabetes Research Center and to create a Center for Mucosal Immunobiology and Rheumatic Disease Pathogenesis. Individual researchers received major grants to study a potential therapy for Alzheimer's disease. Total grant support for our faculty in fiscal year 2021 was more than \$516 million.

All these accomplishments occurred while we continued to contend with the many challenges imposed by the pandemic. At the time of writing this message in October 2021, our campus remains in a cautious posture. We have required all employees and students to be vaccinated, and we have protocols in place that require masking in indoor spaces when groups are gathered.

While many activities have been restored, with more scientists in laboratories, staff in offices, and educators and students in classrooms, we remain eager for a more complete return to the full scope of activities on our campus. The interactions cultivated on campus, with the unexpected meetings and unplanned conversations, are key to the collaborations we can develop and the breakthroughs we can make. We are united with the common purpose of improving human health through discovery and care, and I am confident that we will all soon be together on campus in pursuit of those shared goals.



John J. Reilly, Jr., MD
Richard Krugman Endowed Chair
Dean, University of Colorado School of Medicine
Vice Chancellor for Health Affairs



TABLE OF CONTENTS

Mission Statement	8
Values Statement	9
Diversity Values Statement	10
How we are organized	13
Administration and Business Affairs	23
Clinical Affairs	31
Diversity and Inclusion	37
Education	43
Faculty Affairs	91
Medical Scientist Training Program	97
Research	101
Centers, Institutes and Programs	141
Vice Chancellor for Health Affairs	181
Graduate Programs	213
Deceased Faculty	220



Mission Statement

Approved by the Executive Committee and Faculty Senate in January 1993

The mission of the University of Colorado School of Medicine is to provide Colorado, the nation and the world with programs of excellence in:

- ◆ **Education** - through the provision of educational programs to medical students, allied health students, graduate students and housestaff, practicing health professionals and the public at large;
- ◆ **Research** - through the development of new knowledge in the basic and clinical sciences, as well as in health policy and health care education;
- ◆ **Patient Care** - through state-of-the-art clinical programs which reflect the unique educational environment of the University, as well as the needs of the patients it serves; and,
- ◆ **Community Service** - through sharing the School's expertise and knowledge to enhance the broader community, including our affiliated institutions, other healthcare professionals, alumni and other colleagues, and citizens of the state.

Values Statement

Approved by the Executive Committee (October 2008) and Faculty Senate (November 2008)

The University of Colorado School of Medicine works actively to:

- ◆ Advance science through research on the biological mechanisms that underlie illness.
- ◆ Improve both the medical care and science of the uniquely human components of health and disease.
- ◆ Provide specialized and personalized medical care in an efficient environment.
- ◆ Support positive wellness and clinical prevention programs that promote health across the lifespan and lower early mortality.
- ◆ Transmit a high level of primary and specialty clinical expertise to the coming generations of health professionals.
- ◆ Provide a welcoming, challenging, and diverse atmosphere of growth for those who answer the call to careers in health science and service.
- ◆ Develop a diverse funding portfolio that provides the means to develop, attract, and retain nationally competitive research faculty members.
- ◆ Advance competitive medical research productivity through increased external support for innovative research ideas.
- ◆ Enhance the cooperative relationships with affiliate hospitals toward common goals in education, research, and clinical care.
- ◆ Develop a common infrastructure with the affiliate institutions on the new Anschutz Medical Campus to improve the efficient use of joint resources.
- ◆ Expand scholarly collaborations across disciplines within the School of Medicine that stimulate research innovation and increase competitive research funding.
- ◆ Support productive faculty and institutional collaborations with its sister Schools within the University of Colorado Denver to maximize bioscience research potential.
- ◆ Expand productive working relationships with local communities outside the University but within the state and region, whether for clinical, teaching, or research efforts.
- ◆ Pursue entrepreneurial development both in education and in research through collaborations with the private business communities in Colorado and the western region.
- ◆ Further improve working relationships with State and federal government entities to provide direct investment and support for research and education.
- ◆ Build collaborative relationships with medical schools and universities around the globe to enhance mutual growth in medical expertise, scholarship and stature.

Diversity Values Statement

Approved by the Executive Committee (October 2008) and Faculty Senate (November 2008)

The University of Colorado School of Medicine believes that diversity is a value that is central to its educational, research, service and health care missions. Therefore, the SOM is committed to recruiting and supporting a diverse student body, faculty and administrative staff. The SOM adopts a definition of diversity that embraces race, ethnicity, gender, religion, socioeconomic status, sexual orientation and disability. The definition of diversity also includes life experiences, record of service and employment and other talents and personal attributes that can enhance the scholarly and learning environment.

The SOM shall strive to admit qualified students and appoint qualified residents, fellows, faculty, staff and administrators who represent diversity.

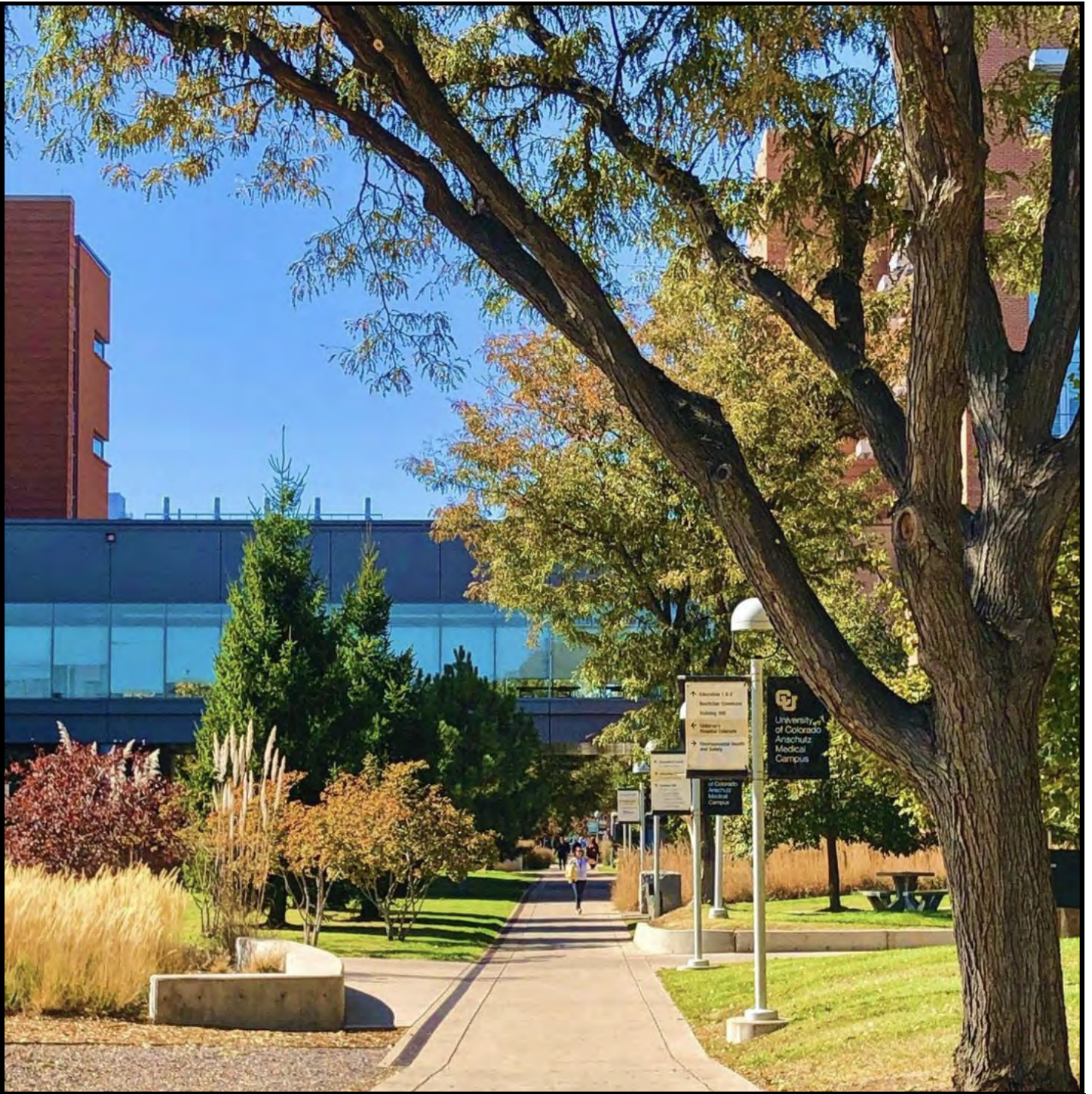
The SOM also shall develop programs that are designed to: Promote the academic advancement and success of minority students, house officers and faculty; enhance cultural and diversity instruction throughout the curriculum; break down racial and ethnic stereotypes and promote cross-cultural understanding; and promote unexplored research agendas and new areas of scholarship.

The SOM's diversity programs also seek to enhance diversity and cultural competency in the health care workforce, improve access to health care for poor, minority and underserved populations and, ultimately, eliminate racial, ethnic and socioeconomic disparities in health and health services.

The SOM will work with all departments and programs within the SOM, and with other University of Colorado campuses and their leaders, to achieve the goals outlined above and to promote a culture of inclusiveness, respect, communication and understanding.

The SOM will support the goals of the University's Vision 2020, which seek to develop a University culture in which diversity and academic excellence are seen as interdependent.



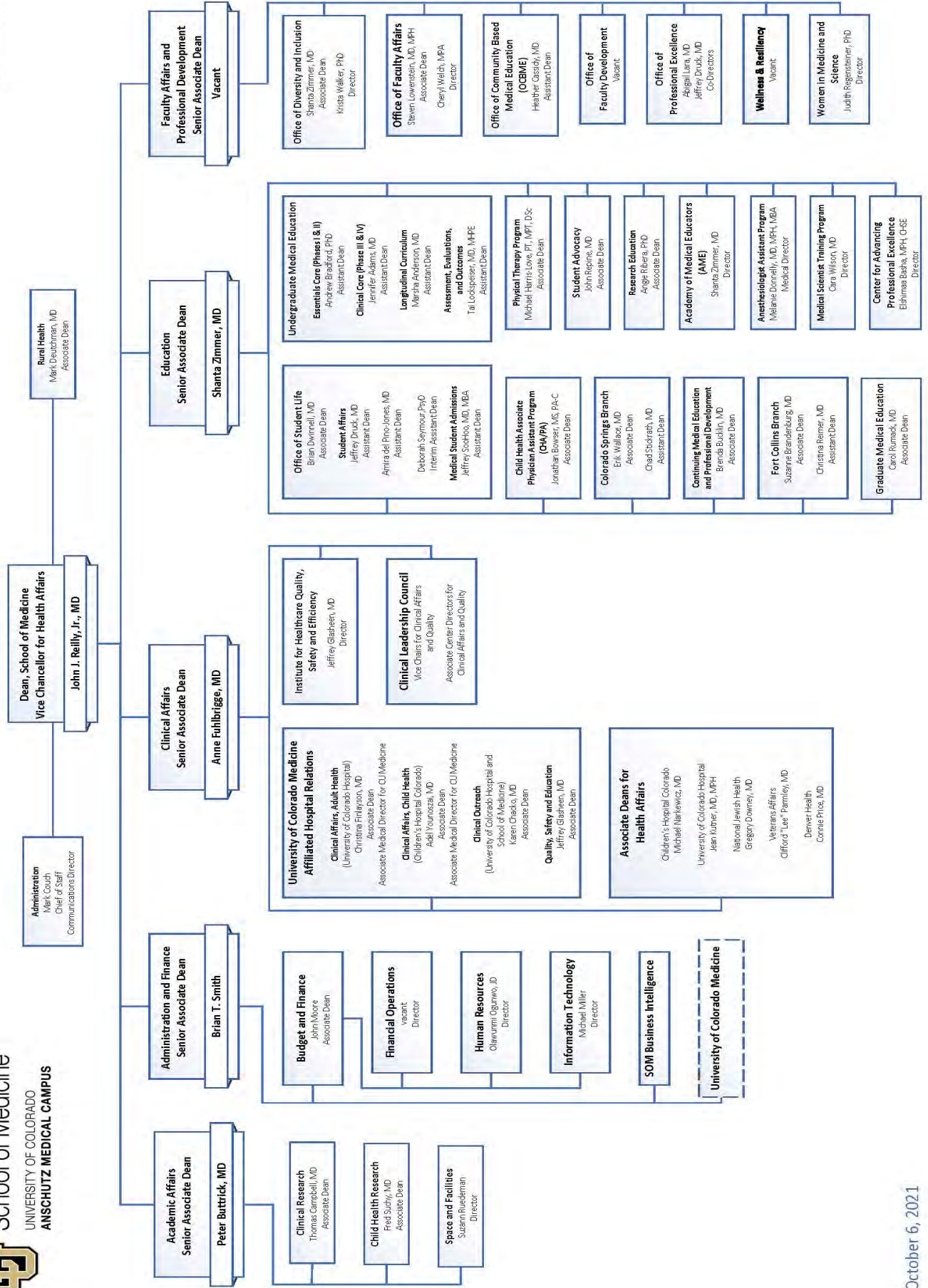


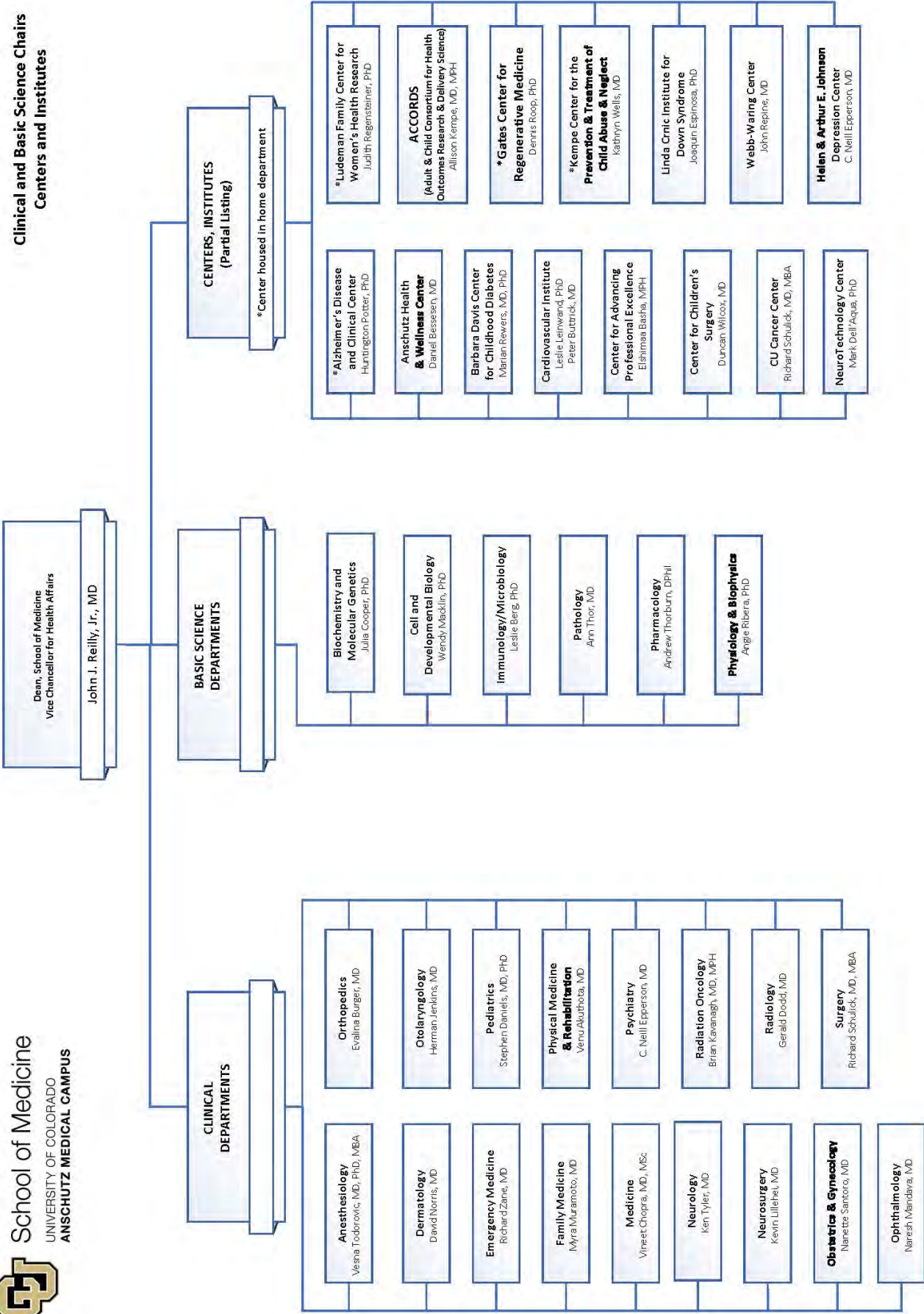
The photo above is courtesy of @cuanschutz Instagram, October 15, 2020.



HOW WE ARE ORGANIZED

The photo above is courtesy of [@cuanschutz Instagram](#), September 11, 2021.





University of Colorado School of Medicine Leadership



*John J. Reilly, Jr., MD,
Richard Krugman Endowed Chair,
Dean, School of Medicine, and
Vice Chancellor for Health Affairs*



*Peter Buttrick, MD,
Senior Associate Dean for
Academic Affairs,
S. Gilbert Blount Endowed Chair,
Division of Cardiology*



*Mark Couch,
Chief of Staff and
Director of Communications*



*Anne Fuhbrigge, MD,
Senior Associate Dean
for Clinical Affairs*



*Brian T. Smith,
Senior Associate Dean for
Administration and Finance,
and Executive Director,
CU Medicine*



*Shanta Zimmer, MD,
Senior Associate Dean
for Education, and
Associate Dean for Diversity
and Inclusion*

School of Medicine Associate Deans



*Jonathan Bowser, PA, MGS,
Child Health Associate/
Physician Assistant Program*



*Suzanne Brandenburg, MD,
Fort Collins Branch*



*Brenda Bucklin, MD,
Continuing Medical Education
and Professional Development*



*Thomas Campbell, MD,
Clinical Research*



*Karen Chacko, MD,
Clinical Outreach*



*Gregory Downey, MD,
Health Affairs, National Jewish Health*



*Mark Deitchman, MD,
Rural Health*



*Brian Dwinell, MD,
Office of Medical Student Life*



*Christina Faloyson, MD,
Clinical Affairs/Adult Health*



*Jeffrey Glasheen, MD,
Clinical Affairs, Quality and
Safety Education*



*Michael HarrisLove, PT, MPT, DSc,
Physical Therapy Program*

School of Medicine Associate Deans



Jean Kutner, MD, MPH,
Health Affairs,
University of Colorado Hospital



Steven Lovenstein, MD, MPH,
Faculty Affairs



Michael Narkevitz, MD,
Health Affairs, Children's Hospital Colorado



Clifford "Lee" Parmley, MD, JD,
Health Affairs, Veterans Affairs



Connie Savor Price, MD,
Health Affairs,
Denver Health and Hospital Authority



John Repine, MD,
Student Advocacy



Angie Ribero, PhD,
Research Education



Carol Rumack, MD,
Graduate Medical Education



Frederick Suchy, MD,
Child Health Research



Erik Wallace, MD,
Colorado Springs Branch



Adel Younoszai, MD,
Clinical Affairs/Child Health

School of Medicine Clinical Department Chairs



Venu Akuthota, MD,
Physical Medicine and Rehabilitation



Evalina Burger-Van der Walt, MD,
Orthopedics



Vineet Chopra, MD, MSc, Medicine



Stephen R. Daniels, MD, PhD,
Pediatrics



Gerald "Chip" Dodd, MD,
Radiology



C. Neill Epperson, MD,
Psychiatry



Herman Jenkins, MD,
Otolaryngology-
Head and Neck Surgery



Brian D. Kavanagh, MD, MPH,
Radiation Oncology



Kevin Lillehei, MD,
Neurosurgery



Naresh Mandawa, MD,
Ophthalmology



Myra Muramoto, MD, MPH,
Family Medicine



David Norris, MD,
Dermatology



Nanette Sanitro, MD,
Obstetrics and Gynecology



Richard Schulick, MD, MBA,
Surgery



Ann Thor, MD,
Pathology



Vesna Ierovcic-Todorovic, MD,
PhD, MBA, Anesthesiology



Kenneth Tyler, MD,
Neurology



Richard Zane, MD,
Emergency Medicine

School of Medicine Basic Science Department Chairs



*Leslie Berg, PhD,
Immunology and Microbiology*



*Julia Promisel Cooper, PhD,
Biochemistry and Molecular Genetics*



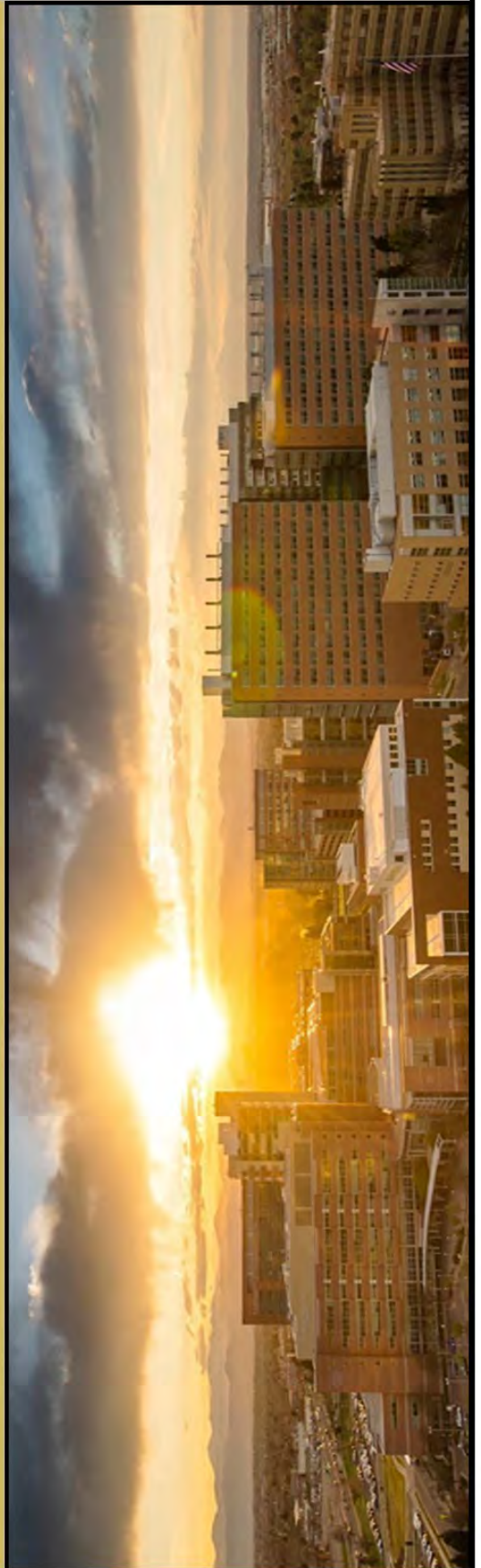
*Wendy Macklin, PhD,
Cell and Developmental Biology*



*Angeles Ribera, PhD,
Physiology and
Biophysics*



*Andrew Thorburn,
D Phil, Pharmacology*



School of Medicine Center, Institute, and Program Directors



*Eshimaa Bascha, MPH,
Center for Advancing
Professional Excellence*



*Daniel Bessezen, MD,
Anschutz Health and Wellness
Center*



*Marc Baracos, MD, MPH,
Colorado Prevention Center*



*Peter Buttrick, MD, Co-Director,
Cardiovascular Institute*



*Mark Dell'Acqua, PhD,
NeuroTechnology Center*



*C. Neill Esperson, MD,
Helen and Arthur E.
Johnson Depression
Center*



*Joaquin Espinosa, PhD,
Linda Crnic Institute
for Down Syndrome*



*Thomas Finger, PhD,
Co-Director, Rocky Mountain Taste and
Smell Center*



*Casey Greene, PhD,
Center for Health Artificial Intelligence*



*Kathryn Hassell, MD,
Colorado Sickle Cell Treatment
and Research Center*



*James Kelly, MD,
Marcus Institute for Brain Health*



*Allison Kenpe, MD, MPH,
Adult and Child Consortium for
Health Outcomes Research
and Delivery Science*



*Leslie Leinwand, PhD, Co-Director,
Cardiovascular Institute*



*Marilyn Manco-Johnson, MD,
Hemophilia and Thrombosis
Center*

School of Medicine Center, Institute, and Program Directors



Huntington Potter, PhD,
CU Alzheimer's and Cognition Center



Judith Regenstein, PhD,
Ludeman Family Center for
Women's Health Research



John Repake, MD,
Webb-Waring Center



Diego Restrepo, PhD,
Co-Director, Rocky Mountain
Taste and Smell Center



Marian Revers, MD,
PhD, Barbara Davis
Center for Diabetes



Dennis Roop, PhD,
Gates Center for
Regenerative Medicine



Paul Rozance, MD,
Co-Director, Perinatal
Research Center



Richard Schulick, MD, MBA,
University of Colorado Cancer Center



Robin Shandas, PhD,
Center for Bioengineering



Kathryn Wells, MD,
Kempner Center for the Prevention
and Treatment of Child Abuse
and Neglect



Duncan Wilcox, MD,
Center for Children's Surgery

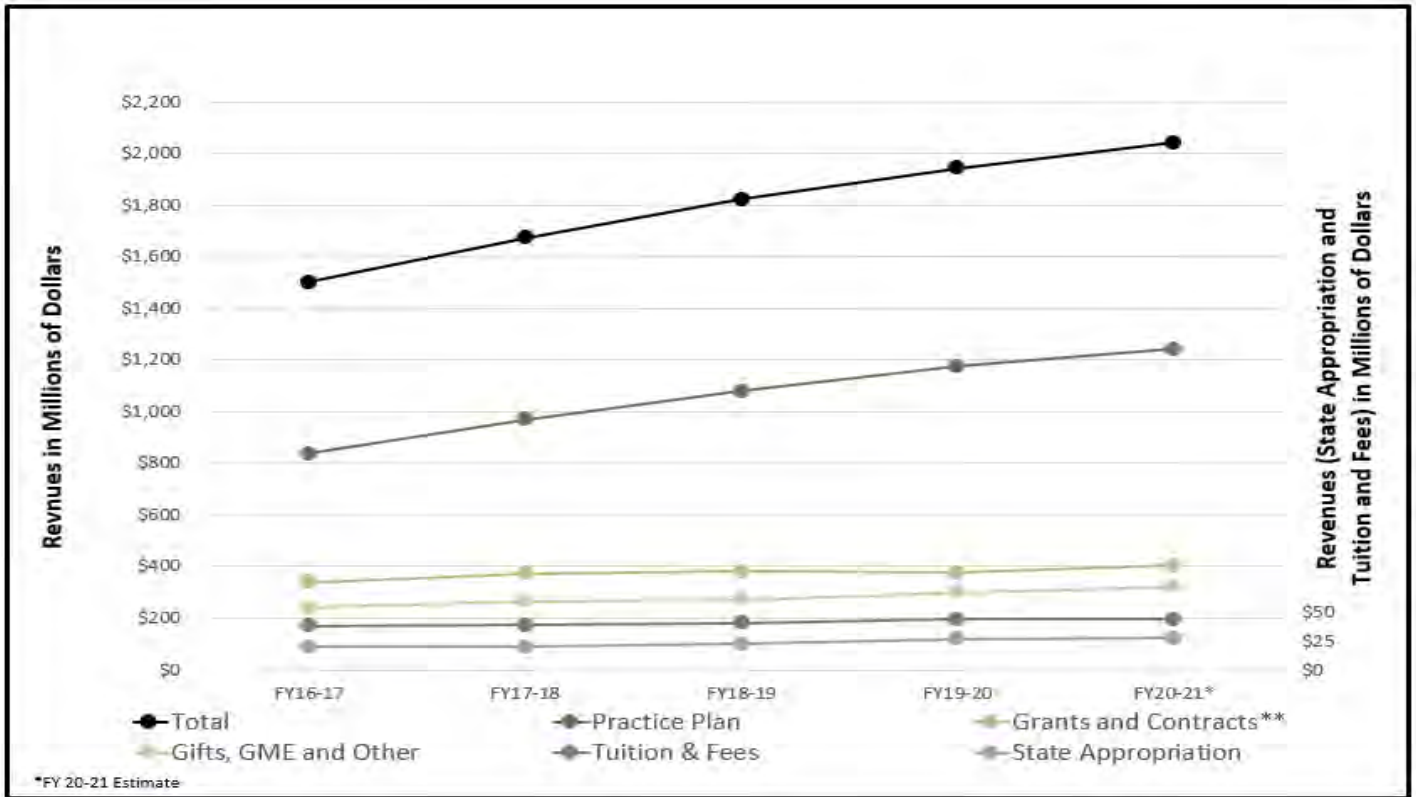


Randall Wilkening, MD,
Co-Director, Perinatal Research Center

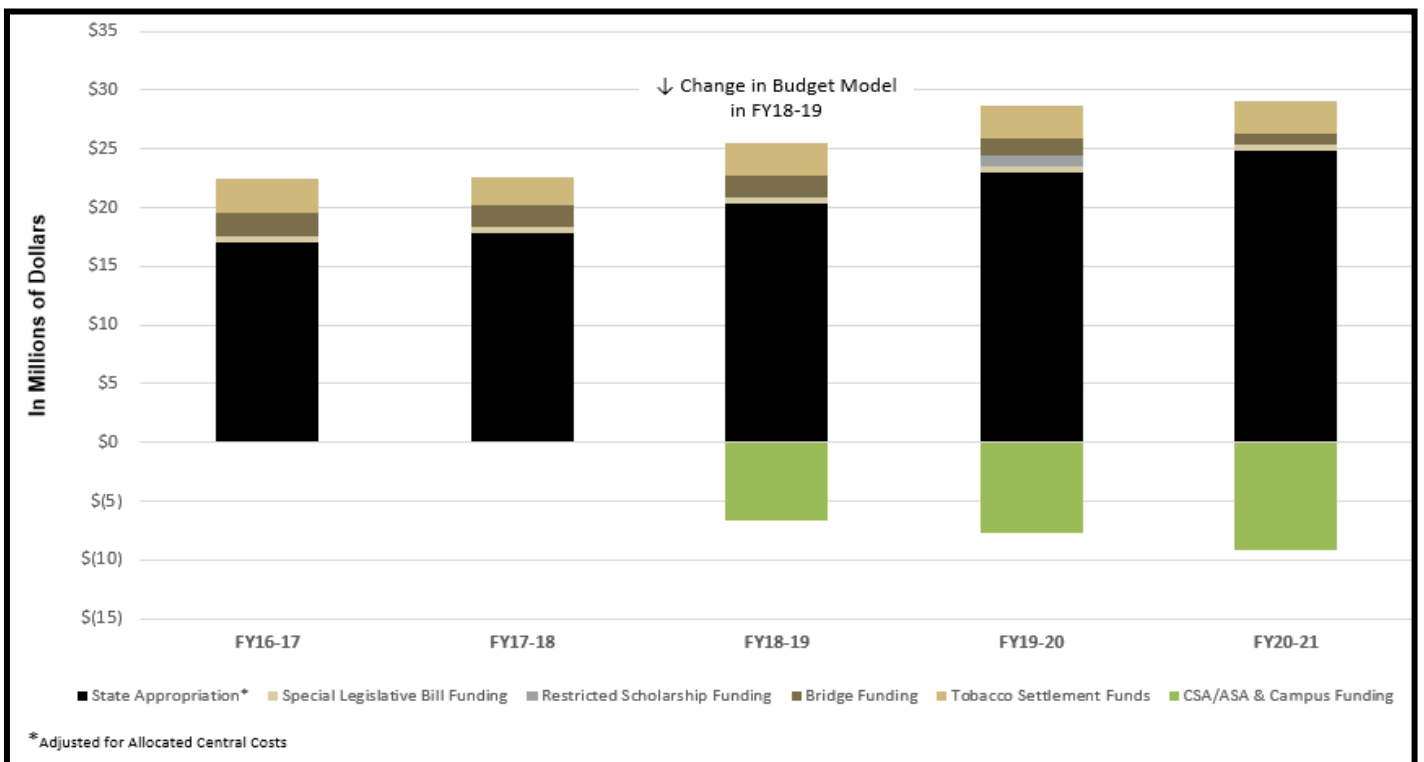


Administration and Business Affairs

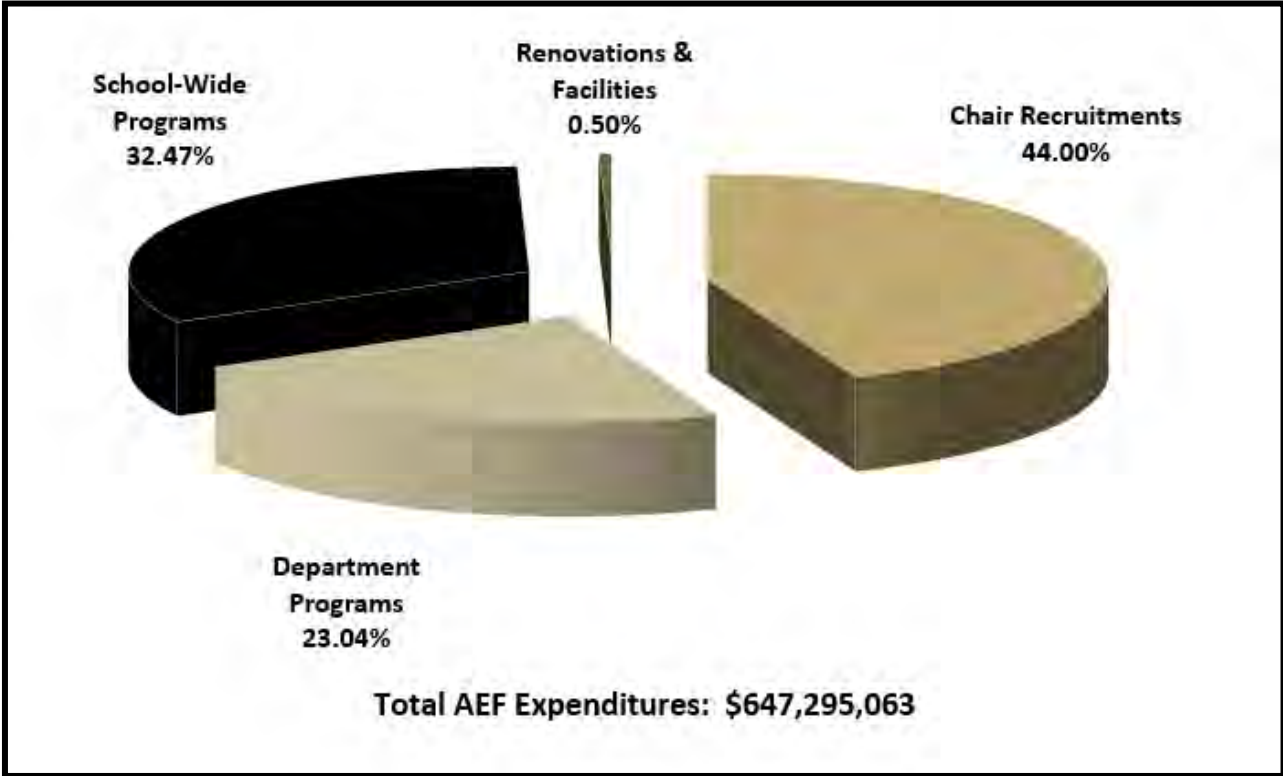
CU School of Medicine Trend in Revenue Source Fiscal Years 2017- 2021



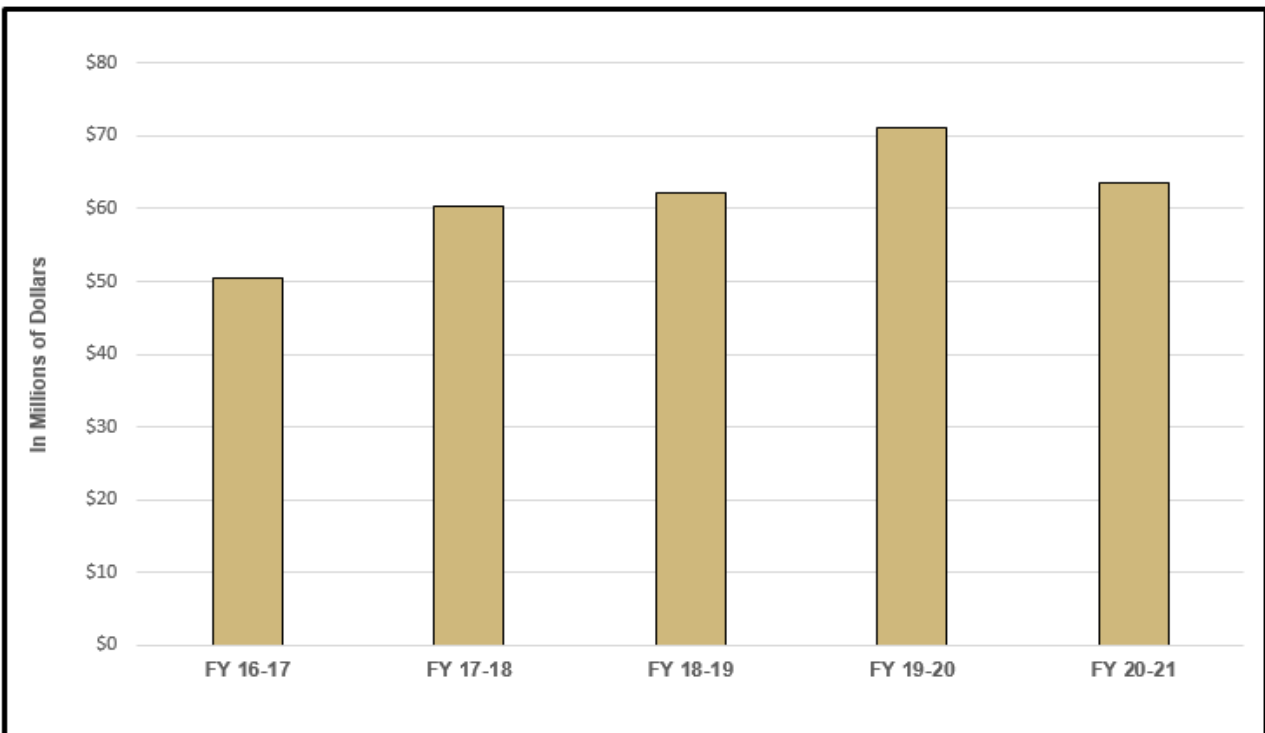
Trend in School of Medicine General Fund Fiscal Years 2017 - 2021



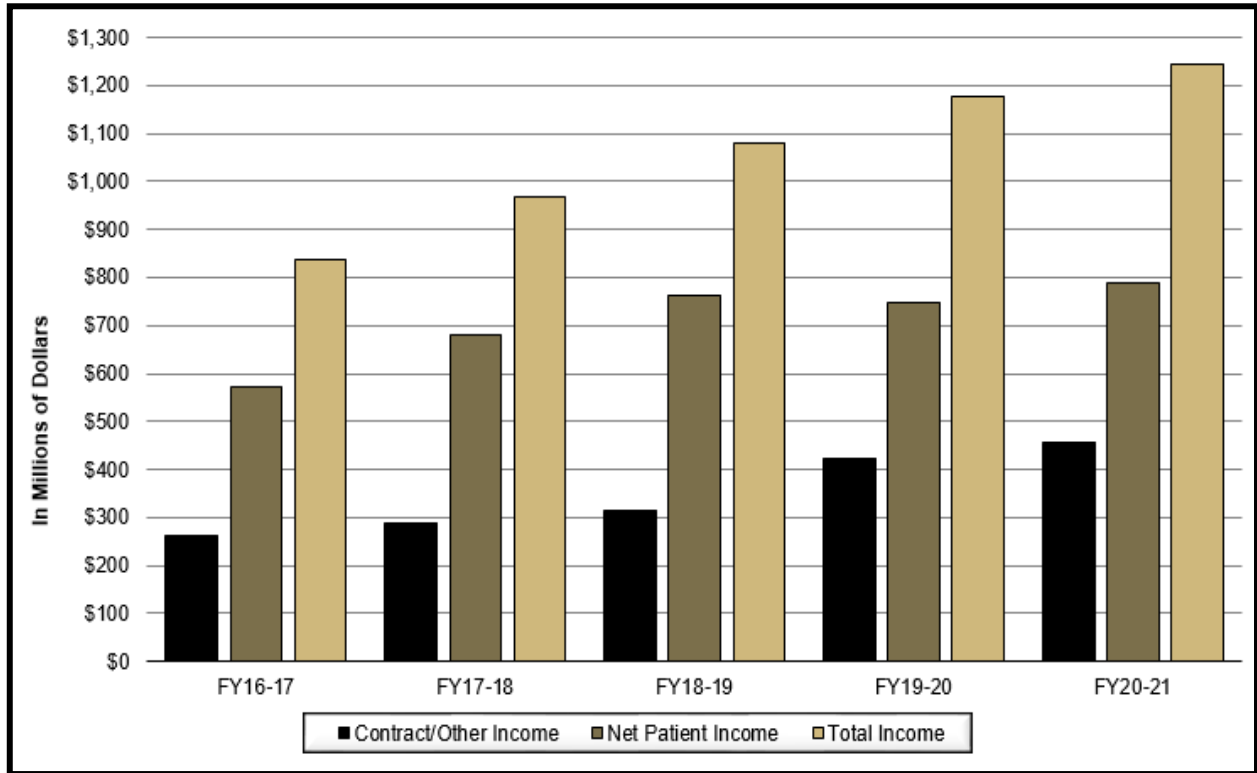
**Academic Enrichment Fund Expenditures
Fiscal Years 1983 - 2021**



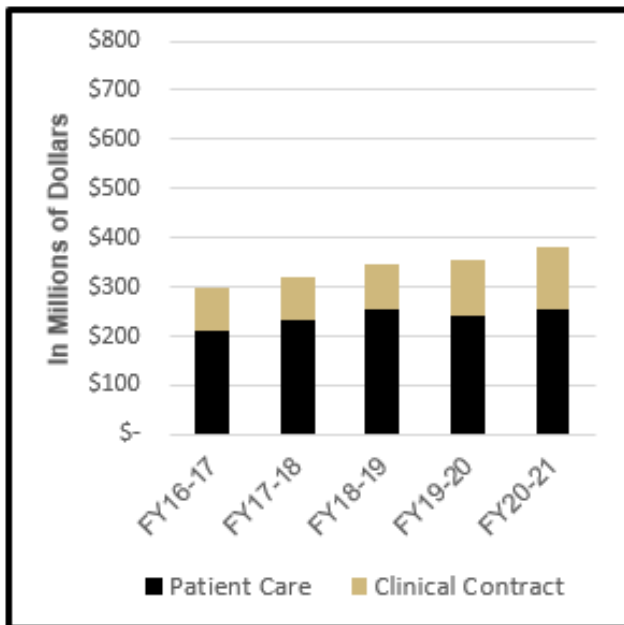
**School of Medicine Commitment Expenditures
Fiscal Years 2017 - 2021**



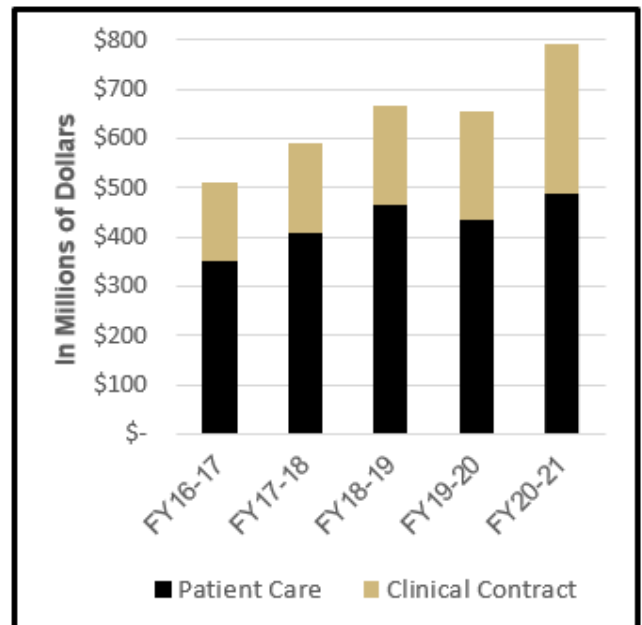
**CU Medicine Patient and Contract Income
Fiscal Years 2017 – 2021**



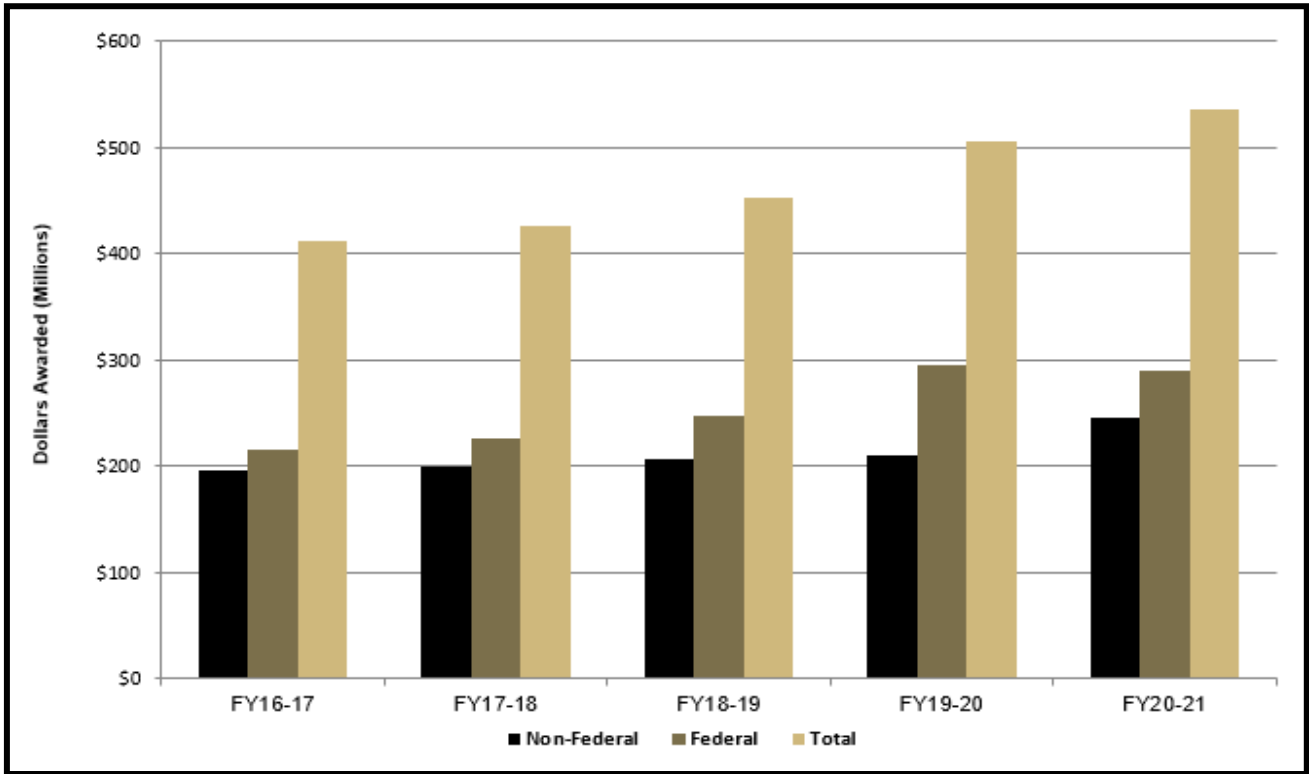
**University of Colorado Medicine
Child Health Clinical and Contract Income
Fiscal Years 2017— 2021**



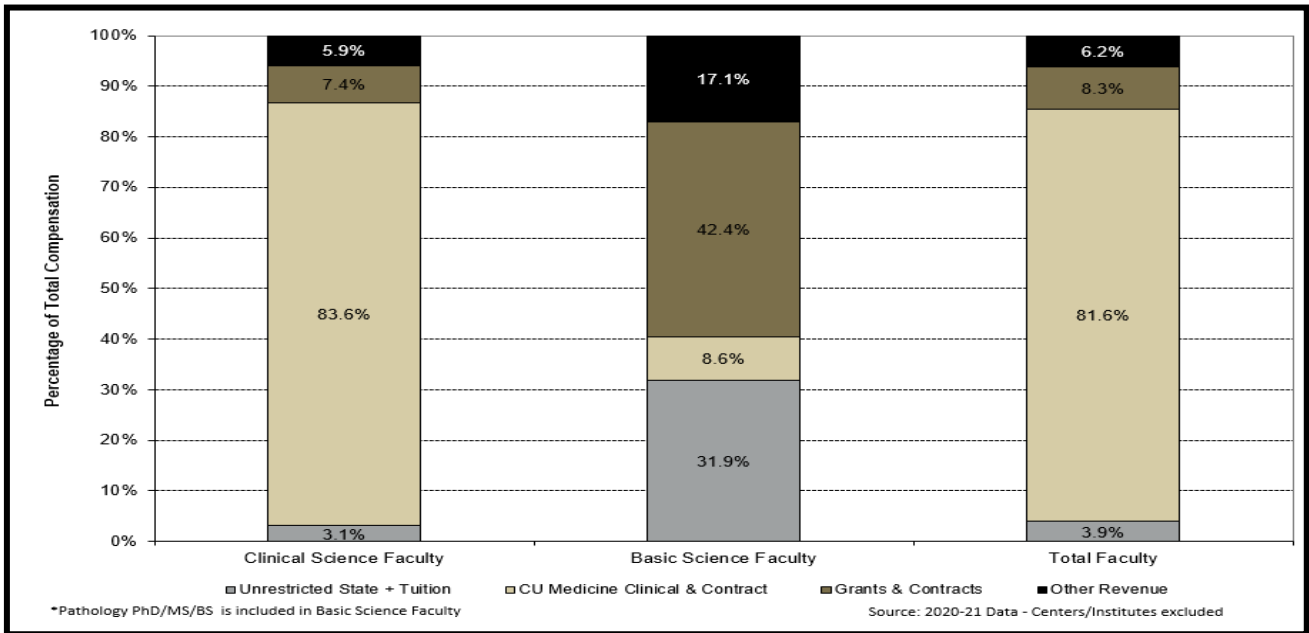
**University of Colorado Medicine
Adult Health Clinical and Contract Income
Fiscal Years 2017— 2021**



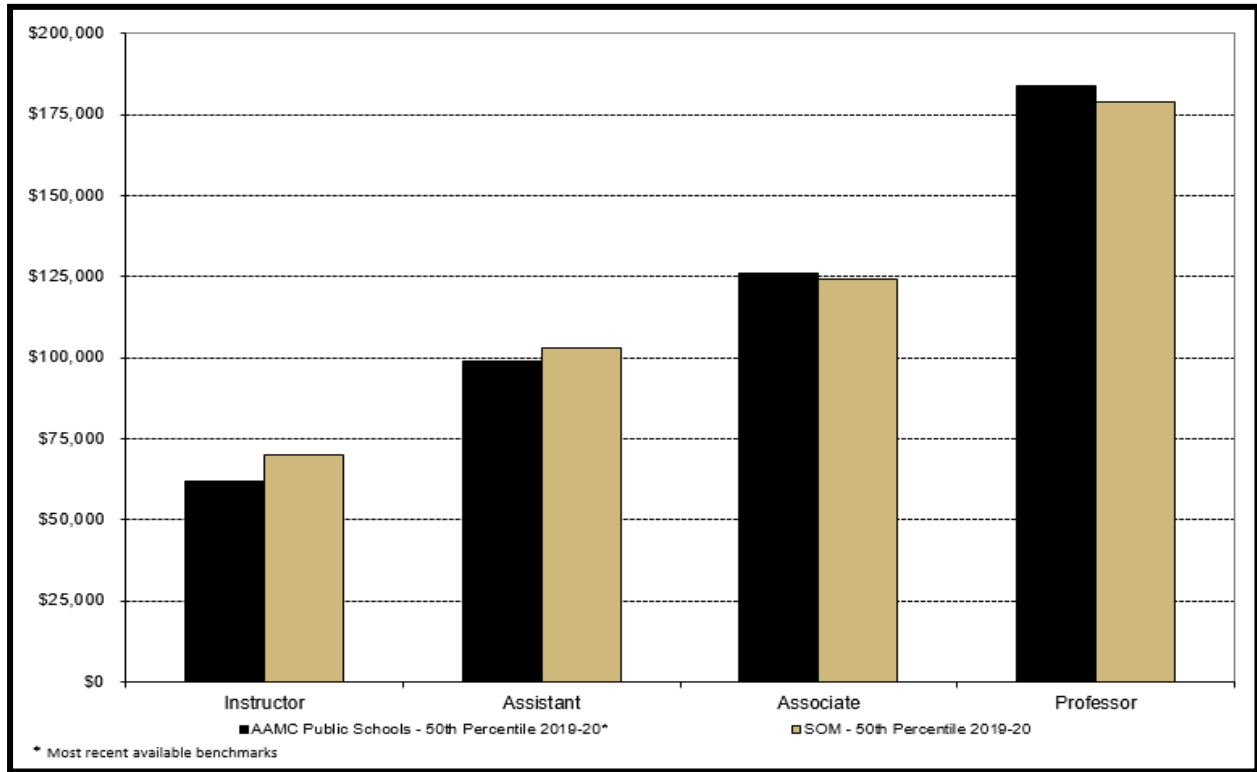
Sponsored Research Award Trend Fiscal Years 2017 — 2021



Source of School of Medicine Faculty Compensation Fiscal Year 2020— 2021

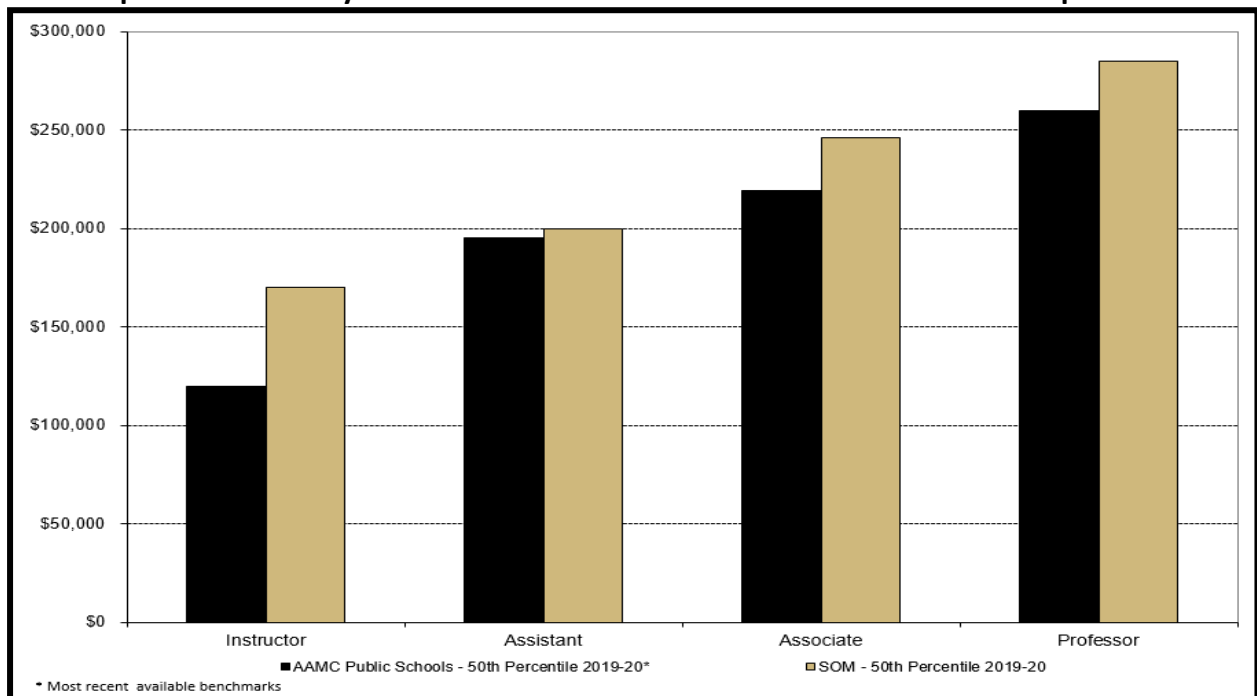


Comparison of Faculty Fixed Salaries to AAMC Benchmarks for Basic Science Departments



Source: AAMC Faculty Salary Survey 2019-2020

Comparison of Faculty Salaries to AAMC Benchmarks for Clinical Science Departments



Source: AAMC Faculty Salary Survey 2019-2020

CU School of Medicine Endowed Chairs

Department/Program	Total
Anschutz Health and Wellness Center	1
Barbara Davis Center for Diabetes	7
Ludeman Family Center for Women's Health Research	3
Charles C. Gates Center for Regenerative Medicine and Stem Cell	4
Colorado Prevention Center	1
Dean's Office	3
Linda Crnic Institute for Down Syndrome	1
University of Colorado Cancer Center	20
Webb-Waring Center	1
Department of Anesthesiology	2
Department of Biochemistry and Molecular Genetics	2
Department of Emergency Medicine	1
Department of Family Medicine	3
Department of Immunology and Microbiology	1
Department of Medicine	37
Department of Neurology	2
Department of Neurosurgery	1
Department of Obstetrics and Gynecology	4
Department of Ophthalmology	6
Department of Orthopedics	3
Department of Pathology	1
Department of Pediatrics	2
Department of Physical Medicine and Rehabilitation	2
Department of Psychiatry	2
Department of Radiation Oncology	1
Department of Radiology	2
Department of Surgery	8
Total	121
Pediatrics Children's Hospital Colorado	53
University of Colorado Hospital	1

Source: The University of Colorado Foundation and Children's Hospital Colorado Foundation



The photo above is courtesy of @cumedschool Instagram, June 29, 2021: "A year and a day after Colorado officially recorded its first case of COVID-19, Bryan Raymond, received the state's first COVID-19-related lung transplant. Thanks to Robert Meguid, MD, associate professor of Cardiothoracic Surgery, Bryan was able to spend Father's Day in-person with his kids."



Clinical Affairs



The photo above is courtesy of @ucfmr (Department of Family Medicine residency) Instagram, January 9, 2021: "FULL SCOPE. Here's one of our APDs, Dr. Corey Lyon vaccinating our very own UCFMR residents! The second dose of COVID-19 vaccines is rolling out now, and we couldn't be more grateful. [#sorearms](#) [#fullhearts](#) [#cantlose](#) [#vaccinessavelives.](#)"

Clinical Affairs

The Office of Clinical Affairs partners with clinical leaders to strengthen the clinical practice of the faculty in the CU School of Medicine. Program integration with the school's affiliated partners promotes our collective ability to improve access to faculty expertise and provide safer, patient-centered care at the lowest possible cost. Our affiliated partners include: UCHHealth University of Colorado Hospital, the UCHHealth system, Children's Hospital Colorado, Denver Health, Veterans Affairs Eastern Colorado Health Care System, and National Jewish Health.

Anne Fuhlbrigge MD, MS, serves as senior associate dean for clinical affairs. Fuhlbrigge partners with Associate Deans **Karen Chacko MD, Christina Finlayson MD, Jeffrey Glasheen MD, and Adel Younoszai MD**.

- **Finlayson and Younoszai** serve in joint leadership roles with University of Colorado Medicine, which is the faculty practice plan. Finlayson is associate dean adult health and associate medical director of the adult health practice and Younoszai is associate dean of child health and associate medical director of the child health practice.
- **Glasheen** serves as a leader in quality and safety education for the University of Colorado through his role as the Director for the Institute for Healthcare Quality, Safety and Efficiency.
- **Chacko** leads clinical outreach, including the CU Medicine-UCHMG collaborative task force and directs the digital health expansion across the practice.
- The **Clinical Leadership Council**, comprised of the School of Medicine vice chairs and associate center directors for clinical affairs, provides additional clinical leadership.

With the CU Medicine Office of Value Based Performance, Community Practice, and Business Development and Planning these physicians identify opportunities for clinical, quality, and patient-safety improvements, and help unify and drive projects across the Anschutz Medical Campus, community practice, and outreach to benefit patient outcomes.

Practice improvement initiatives focus on crucial areas, such as team-based care and development of dashboards measuring quality of ambulatory care. With affiliated partners, UCHHealth and Children's Hospital Colorado (CHCO), we continue to partner to develop clinically integrated networks, committed to improving health outcomes for patients, enhancing the provider and staff experience, while reducing the total cost of care. Our programs, like so many others across the U.S., demonstrate a growing momentum in testing and implementing novel programs aimed at value-based healthcare delivery. Two of these, the CORE program (Coordinating Optimal Referral Experience), which leverages asynchronous provider-to-provider electronic consults (e-consults) and templated data rich referrals, and ECHO Colorado (Extension for Community Health Outcomes) have been combined into one operational unit: the Peer Mentored Care Collaborative (PMCC). These programs combined offer an adaptive approach aimed at providing the "right care, right place at the right time." The PMCC is under the leadership of John. F. "Fred" Thomas, PhD, and Duane Pearson, MD. The goal of the PMCC is to develop new programs, provide centralized resources, and to position ourselves as a national leader in new forms of virtual health across a continuum of virtual care options. The last three years of e-consult development and expansion have been exceptional in adoption and impact. Now, through collaboration with a national e-consult vendor, we have created an innovative telehealth platform to expand e-consults to networks of community providers outside the bounds of the EPIC health record. This is a first-in-class e-consult integration connecting two independent EHRs which is now influencing other programs nationally. Similarly, ECHO Colorado provides a platform for providers to convene virtually around specialty subject matter, best practices, and case review for case-based education; creating a cost effective way to interconnect specialty care and primary care to build a "Virtual Medical Neighborhood" that serves the state and region.

The most recent demonstration of the capacity of ECHO to support and change health care was in response to the COVID pandemic. An interdisciplinary panel of public health, clinical, and pharmacotherapy experts was rapidly stood up to provide primary care providers a one-stop location for up-to-the-minute information about COVID-19. The "COVID-19 Just-in-Time" and multiple spin-off ECHO series continue to be widely accessed with over 1,000 individual participants across multiple topics to meet the challenges created by COVID-19 in the primary medical home. The PMCC is fostering new modes of lower-cost care collaboration between primary care and specialty providers and as a result, patients should be able to find more rapid access to high quality care in a burgeoning Virtual Medical Neighborhood.

In the adult health practice, the number and variety of community-based practices continue to grow. We added two Family Medicine practices in 2018 and a third Family Medicine practice in 2019, bringing the total number of Community Primary Care Practices to four (Broomfield, Cherry Creek, Centennial, Greenwood Village). Specialty practice locations were also added, including Orthopedics in Broomfield and Inverness, Dermatology in Aurora and Urology and OB/GYN in the south metro area. These community-based practices bring access to care closer to where our patients live and work. The FY2019 opening of Highlands Ranch Hospital, including a multispecialty medical office building, allows for a variety of services in that community.

Engaging the community and state of Colorado over the past year has been more important than ever in the face of the pandemic. The virtual/digital health explosion boosted the clinical frontier for our faculty as we partner with UCHHealth, CHCO, and their virtual health teams to help provide services to all patients from the comfort and safety of their homes or a location of their choosing, and especially to areas in Colorado that cannot easily access traditional face-to-face specialty care. Moving forward, we realize that virtual care coupled with digital opportunities will remain a new and popular method of clinical care delivery. Telehealth visits in both the adult and child practices remain at approximately 10%-15% per month of total clinical visits, and we will continue to define which visits are best suited to this new format and refine our abilities to provide state-of-the-art care utilizing technologies and methods to enhance the experience. Along with the growth of telehealth, patients from other states have increasingly accessed and benefitted from our providers' expertise, and the Clinical Outreach and Digital Health teams are invested in ensuring the ability to continue expanding this work while remaining compliant and following best practices. Working with our colleagues in the University of Colorado Health Medicine Group (UCHMG) practices, we continue to find alignment and ways to provide the best care possible to all patients in the UCHHealth system through improved communication, safety, and sharing of best practices.

The School of Medicine is partnering with Salud Family Health Centers to open the Aurora Community Health Center (ACHC). On the ACHC campus, the partners will open a new Federally Qualified Health Center (FQHC), where interdisciplinary trainees will work together to provide full-spectrum medical, dental, and behavioral care. Faculty and residents from multi-field primary care disciplines will develop a primary health care model integrating community, social, and clinical services addressing influencers of health to increase health equity and improve health. An FQHC that will eventually be transferred to the ACHC site was successfully opened in 2019 and continues to serve the clinical needs of the Aurora community in 3 zip codes that have had the least access to care in that community.

The child health practice has grown significantly with the successful opening of the new Children's Hospital Colorado in Colorado Springs and the Children's Colorado Health Pavilion in Aurora. In addition, there has been significant expansion of the Children's Colorado North Campus in Broomfield, which opened this spring. The pediatric specialty faculty increasingly partner with health systems in Colorado and the surrounding states to provide subspecialty care to the patients throughout the Mountain West region closer to their home when possible and at the Anschutz Medical Campus when necessary.

The Institute for Healthcare Quality, Safety, and Efficiency (IHQSE) resides in the Office of Clinical Affairs and offers multiple distinct training programs. The Certificate Training Program (CTP) is a yearlong, intensive leadership training program in quality and safety, which has trained over 100 clinical teams from both University and Children's Hospitals since 2013. This training and practical project experience has led to significant improvements in outcomes, reductions in length of stay, enhanced clinic flow, and less medical and surgical harm. Since 2014, both a one-day Introductory Training Program and a two-day Clinical Leadership Development (CLD) course have brought organizational leadership skills and process-improvement knowledge to over 900 participants. In 2018, the Institute added programs in patient safety, process improvement, and leadership training. The Quality and Safety Academy (introduction to case review, just culture, and safety-based improvement work) was developed for and has served over 300 resident and fellow learners. The Lean Training Program (process improvement skills course focused on workflow) and 6S Training Program (process improvement skills course focused on physical workspace optimization) have been widely adopted by faculty, staff and trainees. IHQSE also added a more rigorous leadership training program that builds on principles taught in both CTP and CLD. This two-day leadership course, called Facilitative Leadership, which helps leaders lead sustainable change and generate greater engagement, is now offered in place of CLD.

CU Medicine

University of Colorado Medicine (CU Medicine) is a 501(c)(3) practice organization that supports the clinical practice of the School of Medicine by providing business infrastructure services. The President of CU Medicine is **John J. Reilly, Jr., MD**, and the Executive Director is **Brian T. Smith**.

CU Medicine services include managed care contracting, revenue cycle management, compliance, business development, and financial services for physicians and advanced practice professionals, and infrastructure for population health. All faculty of the CU School of Medicine are members of CU Medicine. The organization is governed by a Board of Directors chaired by the Dean of the CU School of Medicine. The Board is comprised of the chairs of clinical departments, a basic science chair, elected faculty representatives, and designees of the Children's Hospital Colorado and University of Colorado Hospital.

In October 2016, the board approved using University of Colorado Medicine as the name of the practice plan, rather than University Physicians Inc. (UPI), to recognize that the organization represents all faculty of the University of Colorado School of Medicine, including physicians and advanced practice providers.

On the following page is a current organization chart.





Diversity and Inclusion

Office of Diversity and Inclusion

The School of Medicine's Office of Diversity and Inclusion (SOMODI) is led by Associate Dean of Diversity and Inclusion and Senior Associate Dean for Education **Shanta M. Zimmer, MD**, and Director **Krista L. Walker, PhD**. SOMODI staff includes Business Professional **Christy Angerhofer**, and **Janet Meredith**, who serves as director of community-based partnerships, specifically Committed to Community (C2C).

At CU School of Medicine, diversity continues to be a value central to the school's educational, research, community service, and health care missions. The School of Medicine is committed to recruiting and supporting a diverse student body, staff, faculty, and senior administration. The School of Medicine has adopted a definition of diversity that embraces race, ethnicity, sexual orientation, gender identity, disability, religion, political beliefs, rural upbringing, and socioeconomic status. The Office of Diversity and Inclusion continues to serve as the central point of responsibility for coordinating, developing, and evaluating the school's diversity initiatives, policies, and programs spanning pathways to practice and community engagement.

The Dean-appointed School of Medicine Diversity Council serves as the guiding committee for the work of the office and includes members from throughout the Anschutz Medical Campus and external community members. The council meets monthly supporting the diversity and inclusion initiatives of the December 2015 Diversity Plan. An analysis of this plan revealed measurable outcomes of 94 of the 104 recommendations. The plan is currently being updated.

<https://medschool.cuanschutz.edu/deans-office/diversity-inclusion>

Diversity Council initiatives in 2019-2020 included monitoring strategies to continually measure and enhance the diversity, inclusiveness, and climate of the School of Medicine, enhancing recruitment and retention efforts of students, residents, faculty, staff, administrative leadership, and fundraising. Accomplishments of topics addressed by the council are:

- Continued membership of the Physician Assistant and Physical Therapy Programs.
- Strengthening and restructuring the Lesbian Gay Bi-Sexual Transgendered Queer (LGBTQ) curriculum from the student perspective.
- The implementation of the Equity Toolbox, which provides best practices for faculty, researchers, curriculum developers, and other stakeholders in medical education.
- Community engagement including over 70 specific CSTAHR community-based participatory research projects have been completed.
- Faculty search guidelines implemented.
- Cultural Accommodations Policy written and implemented.
- Strengthening partnership with the University of Colorado's Office of Equity.
- Hosting the Women Leaders at Anschutz Medical Campus Networking Event.
- Continuous review of campus pipeline programs, including Post Baccalaureate and BA/BS-MD programs.
- Ongoing efforts to foster diversity in higher education.

Many of these same goals continued into the 2020-2021 school year, while also being mindful of the national political, social, and civil unrest that impacted URiM students, staff, residents, and faculty, as well as the entire campus.

Promotion

In June 2020, Regina Richards, PhD, who served as the founding director for the Office of Diversity and Inclusion, was named associate vice chancellor of diversity, equity, inclusion and community engagement (ODEICE) for the Anschutz Medical Campus. Richards's office focused on expanding initiatives on the campus and within the community with primary emphasis on health equity, outreach, and support. Richards now serves as the vice chancellor for ODEICE.

Funding

In February 2021, the School of Medicine and the Mile High Medical Society established the new Charles J. Blackwood, MD Endowed Memorial Scholarship.

The scholarship will support Black and other URiM medical students. This endowment was named in memory of Charles J. Blackwood, who was the School of Medicine's first Black graduate. This scholarship fund is one of the largest scholarship funds within the School of Medicine. Major contributors to the fund include Centura Health, Colorado Permanente Medical Group, the University of Colorado, the School of Medicine, and private donors.

Pathway Programs

Pathway development and local, regional, and national recruitment continues through partnerships with the School of Medicine Office of Admissions, the Anschutz Medical Campus Office of Inclusion and Outreach, and other CU System networks to recruit under-represented in medicine (URiM) students.

<https://www.ucdenver.edu/offices/diversity-and-inclusion>

The SOMODI, in partnership with the School of Medicine Office of Admissions, continues to participate and co-sponsor the annual Pre-Admissions Workshop (PAW) in partnership with the Four Corners Alliance (University of New Mexico, University of Arizona, University of Utah, University of Colorado, and the Association of American Indian Physicians). Twenty-Five American Indian and Alaskan Native pre-med students attend the three-day workshop, which has a positive impact on their decisions to pursue a career as a physician or other health care professional.

The BA/BS-MD Program housed in the University of Colorado Denver and the SOMODI is a diversity pathway program recruiting highly qualified Colorado high school students from broadly diverse backgrounds to participate in a combined eight-year program that assists students in developing a commitment to serve the healthcare needs of Colorado in the future. Matthew Taylor, MD, PhD, directs the program for the School of Medicine and Krista Walker, PhD is the School of Medicine liaison. The program admits 10 Colorado high school students each year. The first students who successfully matriculated into and graduated from CU School of Medicine are now engaged graduate medical education training across the country.

ODI Student Affinity Groups

The Office of Diversity and Inclusion collaborates closely with the admissions process to matriculate a diverse and inclusive student body within the School of Medicine. For the past six years, the entering class of the School of Medicine consistently has included 25-30 percent URiM students.

To support and solidify SOMODI's commitment to building equitable, inclusive, and welcoming spaces for URiM students, Zimmer, Walker, and Angerhofer hosted virtual informal meet-and-greets throughout the academic year for all URiM MS1s. Zimmer and Walker also engaged with PA and PT students to increase SOMODI's visibility and share information about resources available to students.

To continue the school's goal of increasing URiM students in medicine, members of the ODI and admissions attended the LMSA and SNMA (AMEC) minority recruitment fairs, as well as the AAMC recruitment fair.

The CU Chapter of the **Student National Medical Association (SNMA)** is advised by Leslie Appiah, MD, Department of Obstetrics and Gynecology. SNMA's national impact areas are community outreach, engaging in pipeline programs, and medical education. The Colorado chapter of SNMA provides an inclusive community of support for medical students from diverse backgrounds. The chapter also participates in volunteer community service opportunities throughout Colorado.

This year at the CU SNMA Graduation Celebration, the student award was presented to Katherine Branche, an MS4 for her leadership as a diversity champion. The faculty recognition award for leadership was presented to Shanta Zimmer, MD. Nationally, Stephanie Nwagwu, MS4 served as the regional director for the CU SNMA and was elected as the national chairperson of the board of directors for SNMA. The CU SNMA Chapter continues to be recognized for supporting the mission and vision of SNMA.

CU School of Medicine Chapter of **White Coats for Black Lives Matter (WC4BL)** held its Fourth Annual Eighteen-minute Die-In representing opposition to the police violence and killings of Blacks and Latinos in the United States. Participants include students, faculty, staff, and residents from School of Medicine, Skaggs School of Pharmacy and Pharmaceutical Sciences, and the Physician Assistant and Physical Therapy programs. This year visiting professor, Kimberly Manning, MD, from Emory University School of Medicine, also joined the group. The CU School of Medicine chapter of WC4BL also led the efforts for CU School of Medicine's participation (1 of 17 medical schools) in the 2019 National Racial Justice Report Card (RJRC). The RJRC evaluates medical schools and academic medical centers on 14 metrics encompassing curriculum and climate, student and faculty diversity, police behavior, racial integration of clinical care sites, treatment of workers, and research protocols. Ultimately, White Coats for Black Lives hopes that the RJRC will highlight best practices, increase transparency, and urge medical schools to meet the needs of our patients and colleagues of color. Ranking ranged from A (highest possible) to C (conservatively representing failure to provide). CU School of Medicine's overall grade was a B. The 2019 full report can be found at <https://whitecoats4blacklives.org/wp-content/uploads/2019/08/RJRC-2019-Full-Report-Final-8.28.19.pdf>. The SOMODI in partnership with CU School of Medicine Chapter of WC4BL student group continues to monitor and update the activities and programs for the RJRC.

The CU Chapter of the **Latinx National Medical Society (LMSA)** formed in 2019 continues to be very active in providing support for the Hispanic and Latinx students on our campus and the Aurora community. This student interest group supports the mission, vision, and values of the National LMSA organization which include:

- Recruitment and admission of Latinx-American scholars.
- Retaining members in health professions programs.
- Educating themselves and others in areas of concern to the Latinx communities in curricula, politics of health care systems.
- Fostering the refinement and development of research skills among members.
- Improving health care delivery to Latinx communities.
- Advocating for the rights of Latinx patients.

The CU School of Medicine **FirstUP**, mentoring program designed to support first-generation medical students continues to grow. In 2019/2020, 19 mentor/mentee partnerships were matched providing support for our first-generation students. This support also included some community-building opportunities through joint social events and opportunities for students and mentors to share best practices. In the upcoming year, FirstUP will have close to 80+ potential matches for incoming students. Mentors are current faculty members and CU alumni practicing physicians.

The **Medical Student Pride Alliance (MSPA)** remains an active and social organization committed to empowering sexual and gender minority medical students and allies on campus. One of the main goals of MSPA is to increase the number of physicians trained in LGBTQIA+-inclusive healthcare by addressing the unique needs of the LGBTQIA+ communities through education, research, advocacy, and service.

The **Asian Pacific American Medical Association (APAMSA)** initiated in 2018 aims to amplify voices of Asian Pacific Islander students, across professional schools, on the Anschutz Medical Campus. APAMSA is open to all health professional students at CU to bring a greater awareness to issues that impact AAPI populations in Colorado.

Graduate Medical Education

Christy Angerhofer serves as the main liaison between ODI and GME. To increase equitable practices of inclusion and to increase diversity initiatives across GME, ODI provides several DEI consultations for residency programs at CU. In addition to consultations, ODI also provides mentorship and training in the following areas: holistic review, implicit bias, microaggressions, systemic racism, and allyship.

GME Second Look Day included 280 participants led by collaborations between the Departments of Emergency Medicine, Obstetrics and Gynecology, Physical Medicine and Rehabilitation, Interventional Radiology, Radiology, Pediatrics, Family Medicine, Surgery, Neurology, Internal Medicine, and Pediatrics and Internal Medicine took place virtually February 2021. This event increased the visibility of our GME programs. All participating programs successfully recruited URiM residents to their entering intern classes in 2021. One hundred and forty-three prospective URiM residents attended Resident Second Look Day 2021 from at least 20 different programs. The SOMODI continues to work with GME Programs to train programs on review of holistic GME recruitment processes.

The **Minority and Ally Resident Council (MARC)** continues to support minority residents through mentoring, professional development, and opportunities for social gatherings to address the needs of minority residents. One of the primary goals of this council is community building among residents of any minority status. This group has over 60 residents as part of its membership base. Faculty members are Shanta Zimmer, MD, and Regina Richards, PhD, who with Christy Angerhofer provide ongoing leadership, mentoring, and support for the group. The 2019-2020 President, Prashanth Francis, MD, PhD, is continuing within the CU system as faculty in the Division of Gastroenterology and Hepatology. The incoming 2020-2021 president is Shawnecca Burke, MD (Family Medicine Resident) and the vice president is Daniel Colon-Hidalgo (Pulmonary Fellow)

SOMODI also provides guidance and support for multiple NIH T32 training grants within departments and programs to enhance their efforts to increase diversity in the grantee pool as well as to support efforts around mentorship and retention of scientists from URiM background.

Faculty and Staff

Recruitment and retention of a highly skilled diverse faculty continue to be a priority within the School of Medicine. The Dean continues to support the hiring initiative that provides salary support (0.2 FTE for three years) for highly qualified URiM recruits to the School.

Development of a community for faculty and staff continues with the University of Colorado Organization for Racial and Ethnic Support (UCOLORES), which hosts a series of faculty development activities for members designed to help build bridges and develop relationships for informal mentoring partnerships and supportive relationships among diverse faculty and staff.

The Department Diversity Leadership Group, consisting of leaders in Medicine, Surgery, Radiology, OB/GYN, Otolaryngology, Department of Family Medicine and Pediatrics, continues to meet monthly to discuss DEI issues in the School of Medicine and nationally. Departments provide protected time to these faculty members holding the role and responsibility of Department Diversity Leader as a commitment to D & I initiatives and strategies. Zimmer and Angerhofer provide mentorship for these positions.

SOMODI continues to host meet-and-greet events for newly hired African American and Hispanic/Latinx faculty and their families to introduce them to the Denver community. The Women of Color group was also created to host monthly social gatherings for CU School of Medicine Black/African American faculty.

The Fifth Annual Toast to Diversity and Call to Action was cancelled due to the COVID-19 pandemic.

Community

Support of the growing community on and around the Anschutz Campus is an important priority to the SOMODI. Students from Medicine, Pharmacy, Nursing, Dentistry, and Physical Therapy work in Aurora's DAWN clinic where they provide multidisciplinary care, serve as health care navigators to uninsured patients, and learn the importance of teamwork and advocacy on the health of communities.

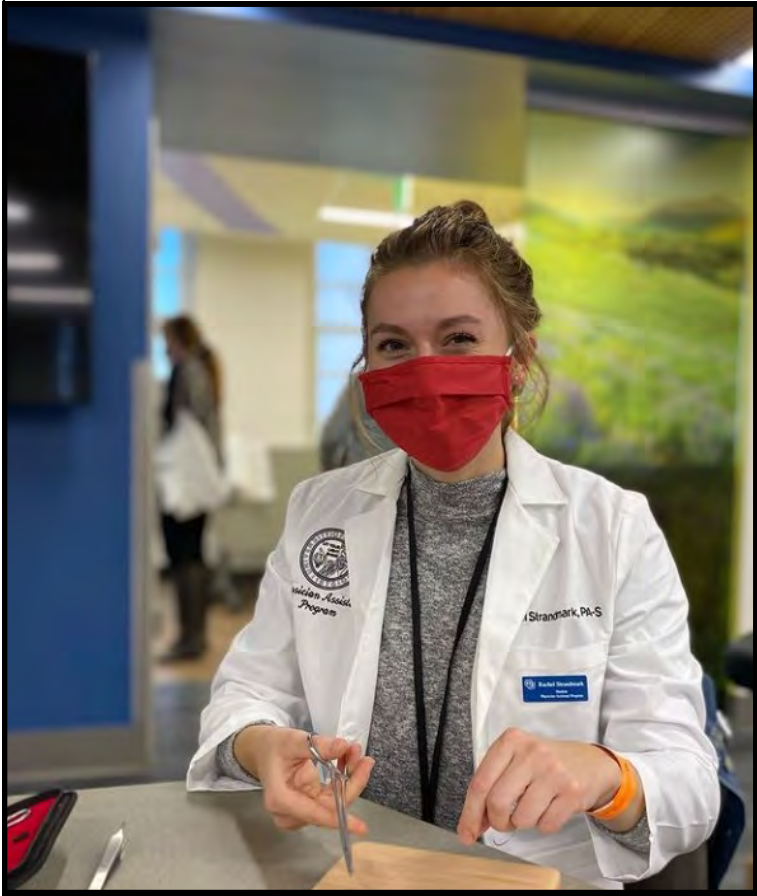
Under the direction of Janet Meredith, Director Committed to Community (C2C), SOMODI continues to be engaged in the 2040 Partners in Health Community Advisory Network. A highlight of this collaboration is the multi-year mentored scholarly activity project of CU-UNITE Track medical students exploring intervention strategies to help providers understand and reduce occurrences of discrimination in healthcare. In addition to this, other projects include:

- Expansion of the mentored scholarly activity project reviewing CU School of Medicine curriculum in response to unconscious bias concerns has resulted in several student-led initiatives to address topics such as race and racism in medicine.
- Nine community engaged partnerships with community members working on a range of health issues of importance to communities, including the impact of health care racism on marginalized communities, infant and maternal mortality in the African American community, trust and medication adherence among Iraqi refugees, alcohol use in the community of refugees from Burma, climate change and health, and other topics. The work included research, community interventions and education, presentations, and medical school curriculum.

The Community Engagement Curriculum Advisory Board (CECAB), established in 2019 under the SOMODI and is chaired by Janet Meredith and Heather Cassidy, MD, continues to provide oversight specifically over the development of the CU School of Medicine Service-Learning Curriculum. This committee meets bi-monthly and is comprised of faculty, staff, medical students, external community stakeholders and faculty from interdisciplinary schools and departments.

<https://medschool.cuanschutz.edu/deans-office/diversity-inclusion>





Education

The photo above is courtesy of @colorado_pa_program, May 10, 2021.



"Don't get bogged down in what you don't know. Medicine is not about what you know today, but what you will know tomorrow."

Connor Fling, MD, Class of 2021



"Give yourself grace therefore to make mistakes, try new things, and above all, become a better doctor. I promise you will end third year reminded of why you are here, and the amazing days are more at the forefront of your mind than the bad."

Nicholas Bianchina, MD, Class of 2021



"There will be days when a patient's story is so tragic that it absolutely destroys you. On these days, 'be brave' may mean allowing yourself to cry..."

Kaitlyn Brunworth, MD, Class of 2021



"The emotions that we feel do not separate us from the task at hand, rather I believe that they connect us to our purpose as providers to recognize and care for those in need."

Sara Delenn Graves, MD, Class of 2021



The photo above is courtesy of @cuanschultz Instagram, September 2, 2021.

The previous page highlights essays from “Letters to a third year student” by the Class of 2021 School of Medicine. A complete listing of essays is posted at https://cuanschultz.edu/docs/librariesprovider139/letters-to-a-third-year/letters-to-third-year-student-2021-final.pdf?sfvrsn=3ae772ba_2

Education

The education programs at the School of Medicine are under the leadership of Senior Associate Dean for Education **Shanta M. Zimmer, MD**. The University of Colorado School of Medicine is committed to lifelong and interdisciplinary learning for health care professionals. We have many programs to serve the needs of undergraduate, graduate, and post-graduate students, in addition to pipeline programs in middle schools to attract and prepare a diverse and talented applicant pool to the health professions. Students graduating from the MD program will be able to compete for positions in our Graduate Medical Education programs that offer outstanding training for residents and fellows. Once graduates complete training as physicians, physician assistants, physical therapists, and anesthesia assistants, the Office of Continuing Medical Education and Professional Development offers lifelong educational programs designed to improve competence, performance, and health outcomes. Included in this section is information on the Academy of Medical Educators that was created to support and enhance all educational programs and teachers at the University of Colorado School of Medicine. The following pages reflect information on all school programs, including Anesthesiology; Center for Advancing Professional Excellence; Child Health Associate/Physician Assistant; Genetic Counseling; Graduate Medical Education; Office of Continuing Medical Education and Professional Development; Physical Therapy; and Undergraduate Medical Education.

Academy of Medical Educators

The Academy of Medical Educators (AME), under the leadership of **Shanta M. Zimmer, MD**, seeks to create a community of dedicated educators who work together to promote excellence in teaching and curriculum throughout the health sciences community. To support this goal, AME inducted six new members in 2020 for a total of 103 members who serve the campus through a series of programs that provide faculty development, coaching, recognition, small grant and other scholarship opportunities, and advocacy in medical education.

In 2020-21, the AME continued to provide regular faculty development opportunities through workshops, online education, and a growing number of individual sessions to departments and programs. The longstanding and highly successful Teaching Scholars Program, under the leadership of **Chad Stickrath, MD** and **Mary Jane Rappaport, PT, DPT, PhD**, graduated 12 interprofessional participants who are now trained in curriculum development, program evaluation, and medical education scholarship. For faculty development, the AME continues to run the biannual Residents and Fellows as Teachers Elective, led by **Eric Young, MD**.

In addition to faculty development and career advancement for educators, the AME promotes education and educators on campus. The AME has increased its role in supporting the scholarship of education, and it serves as a Best Evidence Medical Education Review Site. In addition, we provide a core research infrastructure to provide advice, research assistant support, and mentorship for medical education research projects. In 2019, the AME launched a new monthly Medical Education Grand Rounds Series featuring local and national speakers on topics of pedagogy, mentorship, assessment, and educational innovation across the spectrum of learners in undergraduate and graduate medical education.

Funding for the AME is provided through the School of Medicine Dean's Office and Graduate Medical Education, with additional support for the small grants programs from the Rymer Family and the Office of Faculty Affairs.

Please visit the website for detailed information on each of the above: <https://medschool.cuanschutz.edu/education/academy-of-med-educators>

Anesthesiologist Assistant Program

The University of Colorado's Master of Science Program in Anesthesiology is a rigorous 28-month graduate-level program housed within the Department of Anesthesiology at the Anschutz Medical Campus. When the first class was matriculated in the fall of 2013, it became only the ninth program of its kind in the United States. The past year has resulted in some changes in the Anesthesiologist Assistant program landscape, and there are now 13 accredited Anesthesiologist Assistant programs offering similar degree programs: one school has closed its program (Quinnipiac) and two schools have opened (Nova Southeastern University, Denver; South University, West Palm Beach).

The program is divided into two phases: a 16-month integrated didactic and clinical curriculum followed by a 12-month almost entirely clinical phase. Prior to transitioning into the clinical portion, students must have successfully completed four semesters of basic science, as well as general and advanced anesthesia curriculum. Upon graduation, students will have over 2,700 clinical training hours, not including simulation. Students sit for the national certifying exam provided by the National Commission for Certification of Anesthesiologist Assistants (NCCAA) prior to graduation. Students who successfully complete the program requirements are awarded a Master of Science Degree in Anesthesiology from the University of Colorado School of Medicine.

Mission

The mission of the Master of Science in Anesthesiology Program is to educate and train highly skilled Anesthesiologist Assistants in the cognitive, psychomotor, and affective learning domains so they can work within the anesthesiologist-led Anesthesia Care Team to provide quality patient care.

Leadership

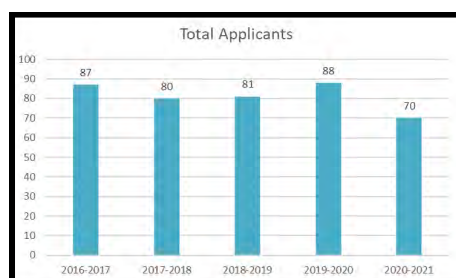
Vesna Jevtovic-Todorovic, MD, PhD, MBA	Chair, Department of Anesthesiology
TBD	Vice Chair of Education, Department of Anesthesiology
Melanie Donnelly, MD, MPH, MBA	Medical Director
Jillian Vitter, MD	Associate Medical Director
Ann-Michael Holland, CAA, MMSc	Program Director
TBD	Associate Program Director
Amy Hebbert	Lead Program Coordinator
Aislinn Lederman	Program Coordinator

Website

The website is updated regularly to reflect the changes in staff, program outcomes and the new class.
<https://medschool.cuanschutz.edu/anesthesiology/education/anesthesiologist-assistant-program>

Student Overview

When the fall 2021 semester begins, the MS-Anesthesiology Program will have a total of 37 students enrolled. The MS-Anesthesiology Program has had six graduating classes and a total number of 59 graduates. Below is the historical data for Total Applicants, Current Student Demographics, Student Demographics at Matriculation, and the Graduation and Certification rates.



In prior reports, the Application data that was presented contained errors. For example, in last year’s report, the following statement, “...the last application cycle producing 522 applicants,” should have stated the number of applicants as 88. The value of 522 comes from our WebADMIT platform and corresponds to the number of applicants who start an application to the Program. The correct totals for fully completed/submitted applications are given above.

Current Student Demographics			
	Class of 2021	Class of 2022	Class of 2023
Students	13	12	12
Male : Female	6:7	7:5	5:7
In-State	12	12	6
Out-of-State	0	0	6

Student Demographics at Matriculation						
	Class of 2018	Class of 2019	Class of 2020	Class of 2021	Class of 2022	Class of 2023
Students	11	13	12	14	13	12
Average Age	27	26	24	25	27	26
Male: Female	6:5	8:5	6:6	6:8	8:5	5:7
In State	8	7	4	6	7	6
Out of State	3	6	8	8	6	6
Average GPA	3.6	3.4	3.5	3.6	3.6	3.6
Average MCAT	59th %ile	56th %ile	57th %ile	62nd %ile	69th %ile	55th %ile

Graduation & NCCAA Exam			
Class	Graduate	Pass	Fail
2021	13*		
2020	12	12	0
2019	13	13	0
2018	11	11	0
2017	10	10	0
2016	7	7	0
2015	6	6	0
Total	59	59	0
Pass Rate		100%	

Recent Accomplishments

Curriculum and Instruction

The MS-Anesthesiology Program offers a 28-month didactic curriculum designed by expert faculty and complemented by clinical rotations. The program boasts a unique curriculum that features didactic courses taught almost primarily by attending anesthesiologists. This gives students the opportunity to formally interact with all members of the anesthesia care team from the beginning of training. Senior year didactics include a senior project in research or quality improvement to supplement clinical requirements and an interactive Senior Seminar where students lead Problem-Based Learning Discussion (PBLD) sessions covering interesting cases and subject matter. In addition to classroom didactics, the students begin clinical hours within the first two months of the program. MS-Anesthesiology students become very comfortable with the operating room environment even before completing the didactic portion of the program. This comfort transforms into self-sufficiency as students rotate through a variety of clinical subspecialties including pediatrics, trauma, cardiothoracic, regional, neuroanesthesia, and obstetrics. While the Anschutz Medical Campus provides excellent learning opportunities, program leaders have also established multiple affiliation agreements with outside clinical sites offering students the opportunity to rotate in clinical settings along the Front Range as well as nationwide. Students complete the program with an extremely well-rounded clinical base of knowledge and level of professionalism and they are comfortable in a variety of environments.

Simulation Lab

The Simulation Lab is an integral part of the overall curriculum during the first year and is comprised of three semesters. Students are taught a variety of skills and concepts utilizing both low-fidelity simulators for task training and a high-fidelity simulator, the SimMan 3G, for scenario-based training. Task-training exercises include basic and advanced airway management, anesthesia machine operation, setup and use of anesthetic agents, invasive monitor placement, and regional anesthesia techniques.

Crisis Resource Management skills are taught using the SimMan 3G with scenario-based training. Crisis Management training includes ACLS protocols, local anesthetic toxicity management, difficult airway management, treatment of severe bronchospasm and many other scenarios. The concepts of TeamSTEPPS (team performance strategies and tools) are incorporated in all the scenarios.

Diversity Scholarship

To facilitate an avenue for increasing diversity in the Anesthesiologist Assistant Program, the Department of Anesthesiology has established its first Diversity Scholarship to provide support to students who are traditionally underrepresented in health science graduate programs. Scholarship funds will cover up to \$45,000 of tuition over the last four semesters of the MS-Anesthesiology Program. Past recipients have been Jonathan London (2018), Fabienne Haas (2019), Mike Dinh (2020), and Kira Floge (2021). Our program is excited to extend the range of the Diversity Scholarship to benefit students from underrepresented groups in their first year of the program. At the time they are offered a position in the program, students in the 2024 class will be invited to apply for one of two \$5,000 tuition scholarships.

Community Outreach

The MS-Anesthesiology students have completed community service projects every semester of the program's existence. In past years, students have prepared meals for Ronald McDonald House Charities of Denver using food from area businesses; raised money by handmaking and selling scrub caps to benefit Lifebox, an organization that sends pulse oximeters to low resource and lower-middle income countries at no or reduced cost; helped to collect used medical supplies for Project Cure, the largest provider of donated medical supplies and equipment to developing countries around the world; and staffed booths at local fundraising events such as Strides for Epilepsy 5K and university health fairs. During the past year, usual outreach efforts were hindered by the COVID-19 pandemic. Within these parameters, the students funded gift cards and donated them to Ronald McDonald House, and participated as a group in a blood drive with Children's Hospital Colorado.

Child Health Associate/Physician Assistant Program

The University of Colorado Physician Assistant Program has gained national recognition for its curriculum in primary care medicine. The program confers a Professional Master's Degree (MPAS). In accordance with the mission of the program, the CHA/PA Program curriculum provides comprehensive physician assistant education in primary medical care with expanded training in pediatrics and for service to disadvantaged, at risk and medically underserved populations. Graduates practice in all areas of medicine and serve patients of all ages.

Mission Statement

The mission of the Child Health Associate/Physician Assistant Program is to provide comprehensive physician assistant education in primary care across the lifespan, with expanded training in pediatrics and care of the medically underserved.

The Colorado Curriculum is a cutting-edge, learner-centered educational platform designed to foster clinical decision-making and lifelong learning skills. The curriculum is based on clinical presentations rather than traditional courses. This approach mimics how patients present for care and how clinicians actually practice medicine. The Colorado Curriculum utilizes an iterative approach to learning, in which clinical presentations that are introduced in the first year are revisited at a more advanced level during second year. The program curriculum aims to provide a strong foundation to equip students for a lifetime of learning, clinical care, and service. Students are expected to be self-directed, motivated, and responsible for their own learning, using critical thinking and reasoning.

Courses emphasize the integration of basic sciences and clinical medicine through the presentation of information in clinical context, employing small group experiences, case-based learning, patient "actors," patient simulators, lectures, and collaborative sessions to build knowledge, skills, and attitudes important for physician assistants. Interdisciplinary training is woven throughout to facilitate the development of a collaborative approach to patient care.

The Bureau of Labor Statistics identifies genetic counseling as one of the fastest-growing health care fields. CU Anschutz Genetic Counseling Program alumni practice throughout Colorado and the nation.

Educational content is enhanced through the applications of family-centered care, behavioral and psychosocial perspectives, as well as social and community initiatives for health and wellness. The program has integrated content in public health, oral health, professionalism, and interprofessional education. Students with a personal area of interest also may participate in specialized tracks to enhance learning in rural, global health, and pediatric critical and acute care.

The curriculum includes fully integrated clinical experiences in hospital and community settings. During clinical experiences, students participate in observations, history-taking, physical examination and assessment, development of a differential diagnosis, and clinical decision-making and planning of treatments and interventions. Students work closely with preceptors and other members of the health care team and are evaluated on skills and competencies required for patient care.

As a part of the University of Colorado School of Medicine, the faculty of the entire school of medicine and affiliates contribute greatly to the quality of the learning experiences provided at the CHA/PA Program. Affiliations with the UHealth University of Colorado Hospital, Children’s Hospital Colorado, and Denver Health and Hospitals in addition to community centers and clinics provide a network of clinical rotations to enhance the training of students. The faculty within the departments of Pediatrics, Family Medicine, Internal Medicine, Surgery, and others regularly participate in both classroom and clinical training of the CHA/PA Program students.

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Program Faculty and Leadership

The education, scholarship, and service roles of the principal faculty of the CHA/PA Program provide students with experienced faculty mentors with clinical practices in general pediatrics, family medicine, and pediatric subspecialties.

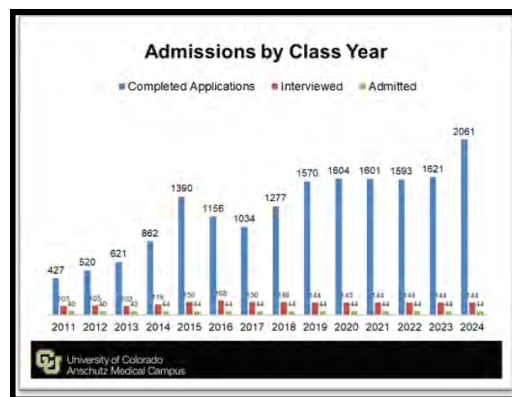
Program faculty serve in state and national leadership roles. Program Director Jonathan Bowser, MS, PA-C, is part of the Physician Assistant Education Association (PAEA) Board, and Associate Director Jacqueline Sivahop, EdD, PA-C, facilitates workshops for new faculty and is a feature editor for the Journal of Physician Assistant Education. Amy Akerman, PA-C, is on PAEA’s Government Relations Steering Committee and was nominated by PAEA to the Interprofessional Education Collaborative (IPEC) Core Competencies Revision Working Group. Kate LaPorta, PA-C, participates in the PAEA Standard Setting workgroup for the End of Curriculum exam, and Kelsey Dougherty, MMSc, PA-C, is a member of the Colorado Academy of Physician Assistants CME committee.

International Connections

The University of Colorado Child Health Associate/Physician Assistant Program continues its partnership with the Trifinio Clinic in Guatemala. CHA/PA students engage in clinical experiences in this clinic site in rural northwestern Guatemala. Our global partnerships continue to offer us new perspectives on our educational program and the work we do here, helping us provide better care for our patients in the US and abroad.

Student Overview

The CHA/PA Program has a very competitive admissions process and continues to attract top students from across the country. During the 2020-21 admission cycle, the program received 2,061 applications, of which 144 were interviewed to admit 44 students. Program graduates are employed in all areas of primary and subspecialty areas of practice including pediatrics, family medicine, surgery, internal medicine, emergency medicine, dermatology, and many more. The program has a 98% five-year average NCCPA board pass rate.



Admissions- Student Demographics			
	Class of 2022	Class of 2023	Class 2024
Total Students	44	44	44
CO Resident	21	19	25
Non-Resident	23	25	19
Overall GPA	3.67	3.73	3.80
Science GPA	3.62	3.68	3.76
Diversity including rural students, students who are first in college, and those from traditionally underrepresented in medicine	36%	30%	36%
Rural Track	5	4	Pending
Global Health Track	2	3	Pending
Pediatric Critical Care	4	4	Pending
Average Age	26	25	25

Program Information

Program Director: **Jonathan Bowser MS, PA-C**

Medical Director: **Tai Lockspeiser MD, MHPE**

Associate Director: **Jacqueline Sivahop EdD, PA-C**

Program website: <http://medschool.ucdenver.edu/paprogram>

Genetic Counseling Program

The Master of Science in Genetic Counseling Program prepares students for professional practice and board certification as genetic counselors. The program is fully accredited by the Accreditation Council for Genetic Counseling (ACGC). Upon graduation, alumni are eligible to sit for the national certification exam administered by the American Board of Genetic Counseling (ABGC). Established in 1971, the CU Anschutz Genetic Counseling Program is the third-oldest training program for genetic counselors in North America and one of only four such programs in the Rocky Mountain region.

Mission Statement

The mission of the Genetic Counseling Program is to train competent, compassionate, and innovative graduates who will effectively integrate professional practice and human genomics to deliver quality, client-centered genetic counseling services, promote informed health policy, and engage in scholarship, advocacy, and leadership activities throughout their careers.

Program Curriculum

The intensive 21-month curriculum integrates extensive coursework in human clinical and laboratory genetics and genomics, psychosocial and counseling theory, research, and ethical, legal, social, and professional practice issues with more than 1,000 hours of direct, supervised clinical training in pediatric, metabolic, reproductive, oncology, adult, and specialty genetics clinics. During the second year, students complete a scholarly mentored capstone project addressing a current clinical practice, laboratory, educational, policy, or service-delivery issue in genetic counseling. Students are encouraged to submit abstracts for presentation of their projects at national meetings and to publish their findings in peer-reviewed journals.

Professional Practice of Program Alumni

Genetic counselors play a critical, expanding role in the health care system. They are at the forefront of precision genomic medicine initiatives. As genetic risk assessment and genetic testing become integral components of virtually all medical specialties, genetic counselors help to ensure quality, informed, client-centered delivery of these services.

Sixty percent of the genetic counselors currently in Colorado trained in the CU program. Practice settings of alumni include hospitals, academic and private genetics centers, diagnostic laboratories, clinical research programs, biotechnology companies, state public health departments, and patient advocacy organizations.

As members of multidisciplinary health care teams, genetic counselors provide scientific expertise, education, risk assessment, non-directive support for decision-making and psychosocial needs, and community resources. Genetic counselors are central to the provision of quality, comprehensive care of individuals and families affected with or at risk for specific genetic conditions, or with genetic predispositions to cancer, cardiovascular or other diseases. Genetic counselors in clinical settings use a client-centered approach to ensure that patients and their medical providers can understand and appropriately utilize genetic information and laboratory tests to promote informed healthcare choices. Laboratory-based genetic counselors serve as professional liaisons to hospital systems, individual health care providers and their patients. They help providers and patients understand new testing modalities and appropriate testing options, conduct utilization management review to promote cost-effective use of genetic testing, and provide individualized results interpretation. Genetic counselors in both clinical and laboratory roles utilize their scientific expertise to research genomic variants and ensure that clinical interpretation of often novel findings of genomic testing reflects current knowledge and is conveyed to clients in an understandable manner. Many program alumni are faculty at their institutions, promoting genomic literacy as educators of trainees, other healthcare professionals and the public, and conducting clinical and translational research. Many alumni facilitate support and advocacy groups for genetic conditions, engage in health care policy development regarding genetic services, and provide consulting to biotechnology and other industries. It is an exciting time for the program's graduates to be entering the genetic counseling field, as professional roles and opportunities continue to expand and evolve in the context of precision genomics-based healthcare.

Student Profile

Admission to the Genetic Counseling Program is highly competitive and is conducted through a national match program. In the spring 2021 admissions cycle, nearly 160 individuals applied for the six available positions in the incoming Class of 2023. The mean GPA of the incoming students is 3.69. Students in the Class of 2022 come from 5 states, including Colorado. They range in age from 23 to 27. Prior professional activities include two students with experience in teaching, content development, and student advising in remote learning settings, one student who worked as a medical scribe in pediatrics and emergency departments, two who worked as genetic counseling assistants in an oncology genetics clinic and in an adult medical genetics clinic, respectively, and one who worked as a research associate in a laboratory engineering recombinant antibodies for various uses. All come with client advocacy and counseling experience in settings that include crisis counseling centers, hospice, domestic violence shelters, community-based programs for individuals with physical or developmental disabilities, and reproductive health clinics.

Notable Accomplishments - 2020-2021 Academic Year

- 100% of the program's 2020 graduates taking the American Board of Genetic Counseling Certification Exam in 2020 or 2021 achieved certification and the CGC credential on their first attempt (nationally, 76-85% of examinees achieved passing scores during these two exam cycles). The first-time boards pass rate has been 100% for the program's past five graduating cohorts.
- Two students in the 2020 graduating class had Capstone research projects accepted for poster presentations at the 2020 National Society of Genetic Counselors (NSGC) Annual Education Conference and one will present a poster about her research at the 2021 NSGC Conference.
- Two students in the 2020 graduating class had first author publications in 2021 about their Capstone research, one in the *Journal of Pediatrics* and one in the *American Journal of Medical Genetics*. Their co-authors were all School of Medicine faculty.
- Most 2021 program graduates entered clinical practice immediately after graduation in the specialties of pediatrics, reproductive genetics, and oncology. One alumnus is pursuing a one-year fellowship in Neurology at CU Anschutz focusing on pediatric and adult neuromuscular diseases.
- Students training during the COVID-19 pandemic are grateful for the outstanding telehealth resources at CU Anschutz, affording only minimal disruption to clinical training and illustrating the tremendous potential of tele-genetic counseling models for expanding patient access to services.

Website: <https://www.cuanschutz.edu/graduate-programs/genetic-counseling>

MS Genetic Counseling Program Information

Program Director: **Carol Walton, MS, CGC**

Assistant Director, Clinical Training: **Kathleen Brown, MS, CGC**

Graduate Medical Education

Carol M. Rumack, MD

Associate Dean for Graduate Medical Education

<https://medschool.cuanschutz.edu/graduate-medical-education>

The Graduate Medical Education (GME) Office is under the leadership & direction of Carol M. Rumack, MD, associate dean for GME at the University of Colorado School of Medicine (CUSOM) & Designated Institutional Official (DIO) for the Accreditation Council for Graduate Medical Education (ACGME). Ashley Walter, MBA, is director of finance and administration. The GME Office is responsible for the oversight of ACGME accreditation an educational environment as well as payroll, benefits, and administrative issues for all residency and fellowship training programs.

Mission: University of Colorado School of Medicine GME will achieve the highest level of accreditation for the CU School of Medicine institution and residency and fellowship programs, and provide leadership, education, and support to its residency and fellowship programs to educate residents and fellows to be outstanding physicians. The GME Office implements policies of the Graduate Medical Education Committee (GMEC) of the School of Medicine. The ACGME charges the GMEC with responsibility for monitoring and advising on all aspects of residency education including compliance with ACGME work hours, patient safety and quality improvement requirements, and in maintaining a strong learning environment.

The GMEC is composed of program directors, GME faculty liaisons from the major teaching hospitals, and officers of the Housestaff Association. GMEC reports to the Dean of the School of Medicine through the Associate Dean for GME and Senior Associate Dean for Education.

COVID ACTIONS taken in collaboration with CU School of Medicine GME Affiliated Hospitals

- Canceled elective surgeries & procedures 3/16 – 4/27/2020 during ACGME Stage 3 (4/3 – 5/2/2020)
- Diverted surgical cases to other sites due to high COVID patient volume
⇒ (ACGME Emergency Status 11/18/2020 – 1/17/2021)
- Reassigned approximately 15% residents & fellows for optimal patient care
- Suspended Moonlighting – ACGME Stage 3 (April/May, 2020)
- Encouraged Moonlighting – ACGME Emergency Status (Nov 2020/Jan, 2021)
- Banned all visiting student/resident rotations, prohibited residents from rotating outside of region March 2020 – August 2021.
- Disaster Credentialed 21 fellows as attendings in core specialty
- Programs used telehealth extensively (approximately 10x previous numbers)
- Quality/Safety and Service Award (\$1000) was distributed to all residents/fellows
- Identified residents/fellows and faculty 'COVID-19 Champions'
- Created GME interdisciplinary PD COVID Work Force Group, including subcommittee chairs/vice chairs, PDs, affiliated hospital partners, Housestaff Association co-presidents and other residents
- Required all events and education be virtual (banned in-person events)
- Guaranteed full stipends if quarantined and could not provide patient care
- Arranged free housing and showers access
- Free meals during COVID, in addition to regular meal ticket
- Established Resident Relief Fund (CU Office of Advancement)
- Project Lift campus and community sponsors paired with residents to provide meals and other kinds of support

CU School of Medicine GME Resident Relief Fund began in the Spring 2020, thanks to generous donors wanting to address COVID-related financial hardship experienced by some residents and fellows. Fifty-seven residents and fellows have qualified for a total of \$114,000 in assistance so far. The fund has expanded its scope to provide residents and fellows with assistance for other types of unanticipated disasters.

9th Annual GME Outstanding Program Coordinator Awards

The Graduate Medical Education Committee, in collaboration with the Program Coordinator Council (PCC), awarded Sara Dillard as this year’s outstanding program coordinator as well as the CU School of Medicine GME Nominee for the ACGME 2022 National Program Coordinator Award.



Sara Dillard
Psychiatry

NEW ACGME PROGRAMS INITIAL ACCREDITATION	
Interventional Radiology - Independent	07/01/2020
Obstetric Anesthesiology	01/25/2021
Complex Family Planning	02/10/2021
Laboratory Genetics & Genomics	04/06/2021
Vascular Surgery – Integrated	04/15/2021

NEW NON-ACGME FELLOWSHIP PROGRAMS
OBG: Pediatric and Adolescent GYN Fellowship
PATH: Soft Tissue Pathology
PEDS: Pediatric Emergency Medicine Research

NEW ACGME PROGRAM DIRECTORS (PDs) & PROGRAM COORDINATORS (PCs)					
	2016/17	2017-18	2018-19	2019/20	2020/21
New PDs	10	11	18	20	19
New PCs (and/or transferred to another program)	20	15	9	9	14
2020-2021 average turn-over rate: PDs = 17% PCs = 19%					

Figure 1 2021-2022 GME Enrollment Data & Trends (Numbers reflect enrollment as of August 1, 2021)

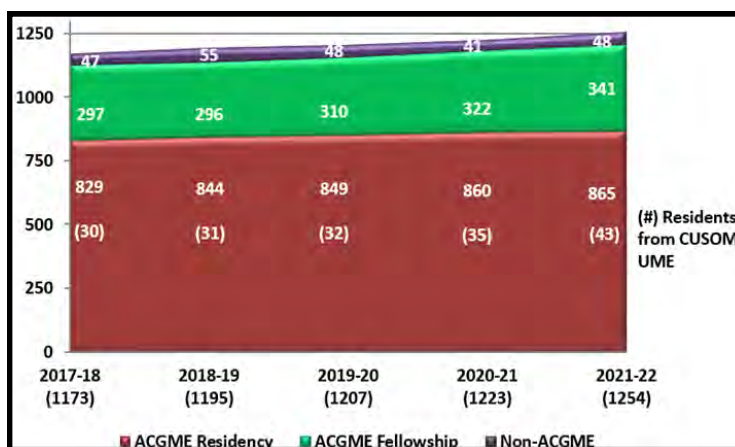


Figure 2 Number of ACGME Accredited GME Programs

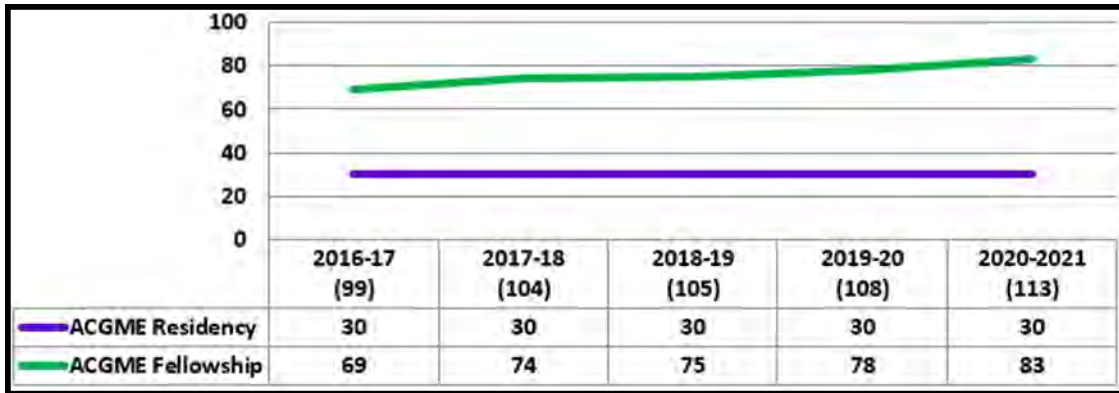


Figure 3 International Medical Graduate Enrollment

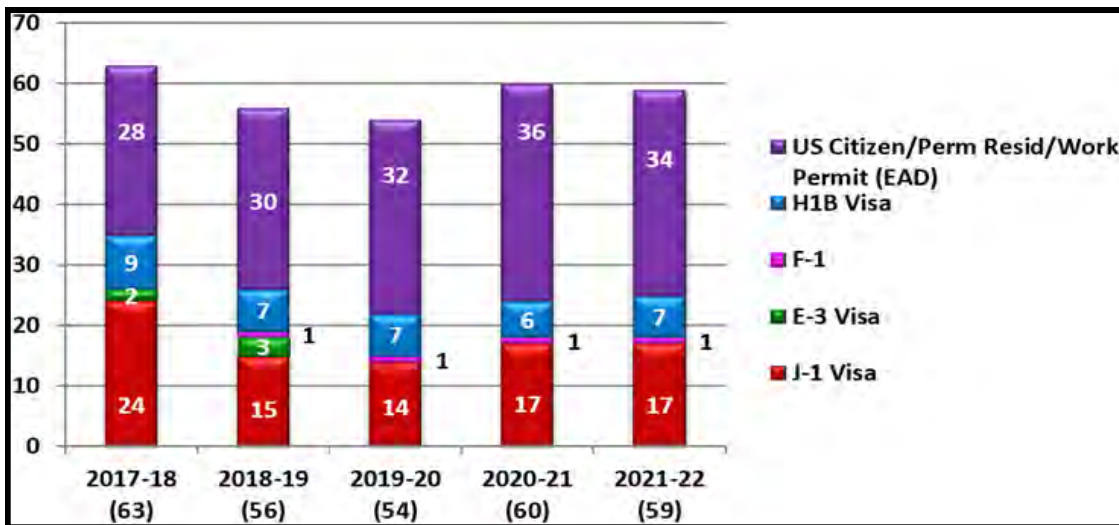


Figure 4 Primary Care vs Specialty Enrollment

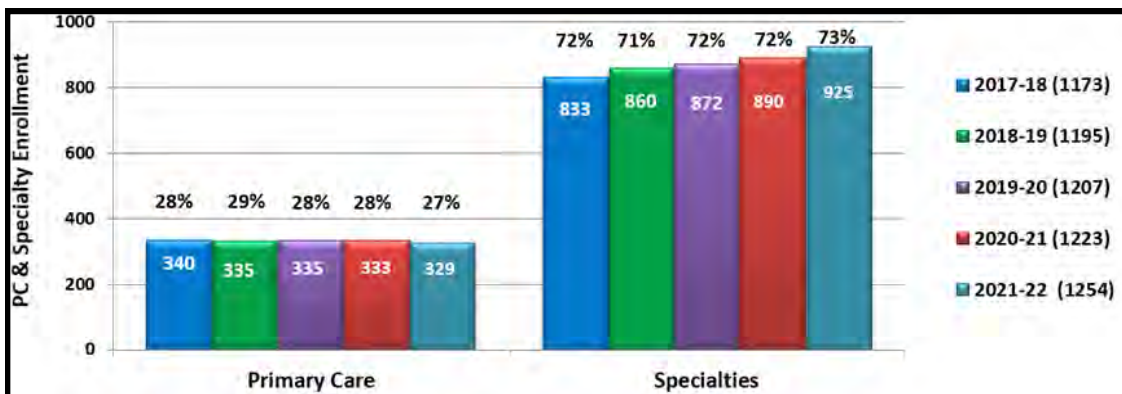
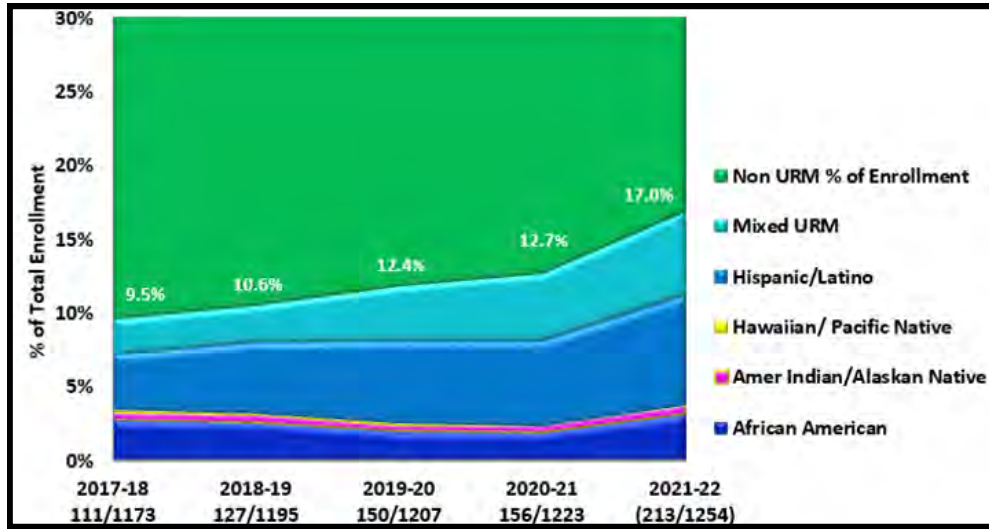


Figure 5 Underrepresented Minority Enrollment % of Total Enrollment (N=1254)



GRADUATE SATISFACTION – GME 2020-21 GRADUATE SURVEY



University of Colorado Neurosurgery Residency

For the 2020-21 academic year ,371 residents and fellows graduated from ACGME and Non-ACGME approved programs. 352 graduates completed the 2020-21 GME Graduate Survey.

Figure 6 Graduates - Overall Satisfaction with Training Program

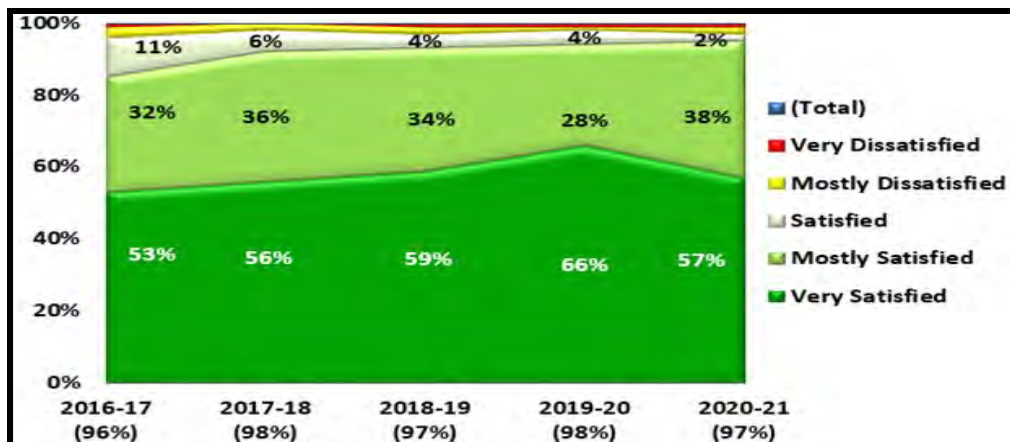


Figure 7 Graduates Who Would Recommend Program

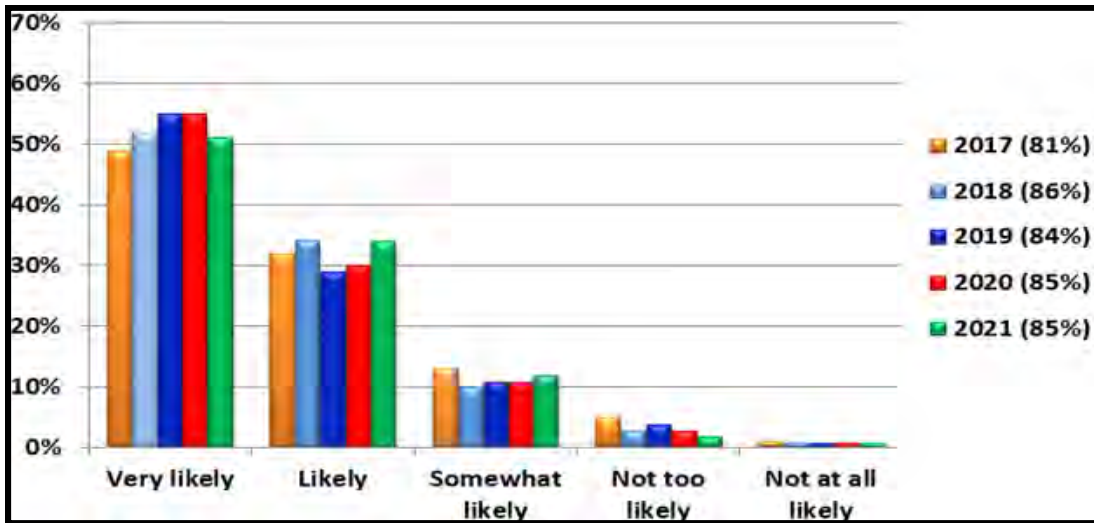


Figure 8 Graduates - Professional Plans

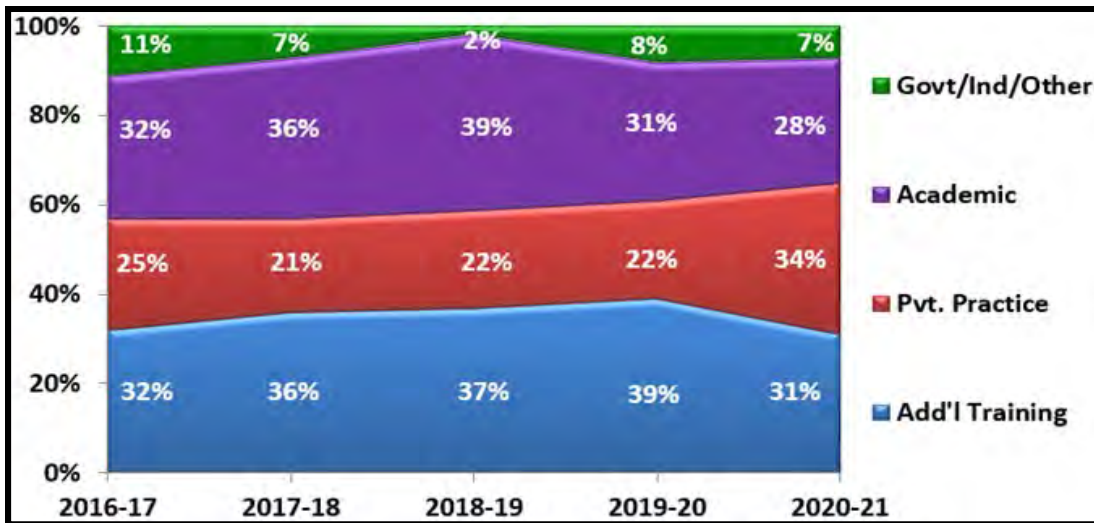


Figure 9 Where Will All Graduates Practice?

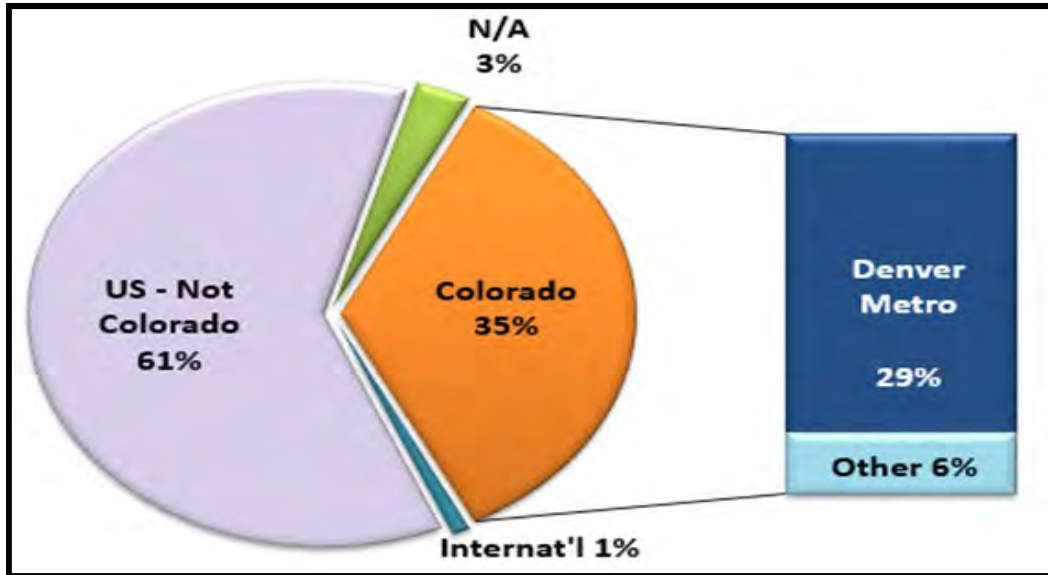
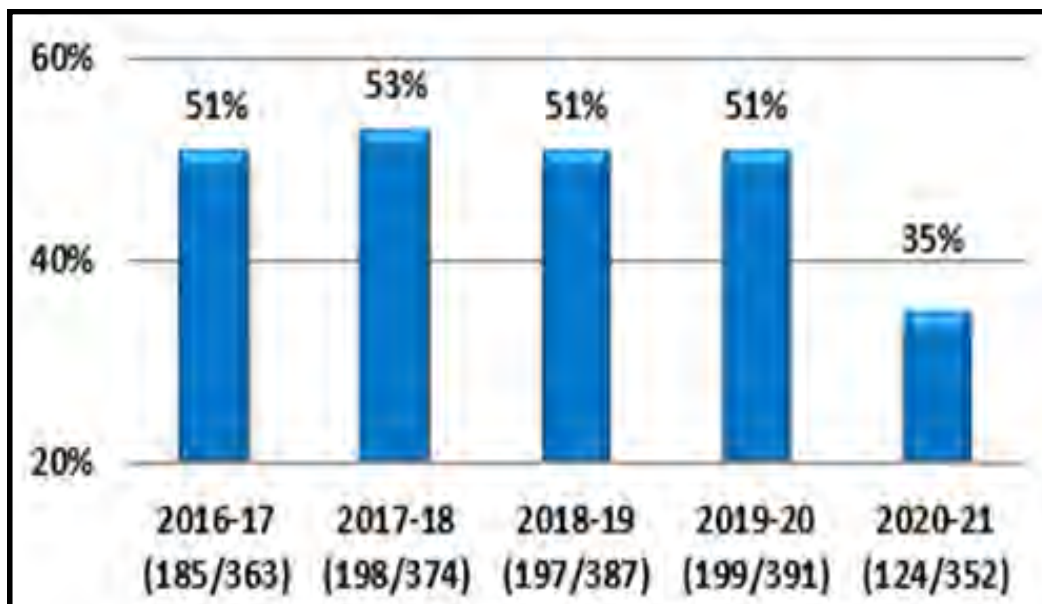


Figure 10 Graduates Planning to Practice in Colorado



Office of Continuing Medical Education

The Office of Continuing Medical Education (OCME) is led by **Brenda Bucklin, MD, MEHP**, Professor of Anesthesiology and Associate Dean for Continuing Medical Education. The office is staffed by Pam Welker (administrator), and Carolyn Wieber and Ellen Boruch (conference managers). The mission of the office is to enhance “learners’ knowledge, competence, performance, or patient outcomes through continuing medical education and professional development activities that are linked to practice and focused on health care quality gaps.” Learners are expected to “apply new knowledge and skills in order to improve performance and patient outcomes in their practice settings.” Additional information can be found at <https://medschool.cuanschutz.edu/education/cme>.

OCME received notification of the school’s reaccreditation with commendation in 2021 by the Accreditation Council for Continuing Medical Education. However, the greatest challenge to OCME during the past year has been the impact of the COVID-19 pandemic on activities certified by OCME. Early in the pandemic, the office recognized the need to provide CME to our CU School of Medicine faculty since faculty were unable to travel to national and international meetings. OCME collaborated and used an expedited process for the delivery of COVID-related grand rounds in the Department of Medicine. Other CME activities were converted to internet live activities (e.g., Family Medicine Review Course). Throughout the academic year, OCME has continued to pivot from live to virtual formats and has reached more than 31,467 MD/DO and 25,765 non-MD learners. In addition, 2,719 hours of instruction were certified for AMA PRA Category 1 Credit™. MOC credit was provided to 986 learners from a variety of specialties.

Physical Therapy Education Programs

The University of Colorado School of Medicine Physical Therapy Program in the Department of Physical Medicine and Rehabilitation is home to three educational programs: Physical Therapy Program, Pediatric Physical Therapy Residency Program, and PhD Program in Rehabilitation Science. Additionally, two candidacy-stage residency programs are within the Physical Therapy Program: a faculty residency and an orthopedic residency.

Program Leadership

Michael Harris-Love, PT, MPT, DSc, FGSA

Associate Dean for Physical Therapy Education
Joanne Posner-Mayer Endowed Chair in Physical Therapy
Director, Physical Therapy Program

Mary Jane Rapport, PT, DPT, PhD, FAPTA

Associate Director, Physical Therapy Program
Interim Section Director, Post-Professional Programs

Jennifer Stevens-Lapsley, PT, PhD

Section Director, Research and Development
Director, PhD Program in Rehabilitation Science

Dana Judd, PT, DPT, PhD

Section Director, Student Affairs

Daniel Malone PT, PhD, CCS

Interim Section Director, Curriculum

Jenny Rodriguez, PT, DPT, MHS

Section Director, Clinical Education

Website: <http://www.cuphysicaltherapy.org>

Physical Therapy Program

The Physical Therapy Program prepares each student to become a Doctor of Physical Therapy (DPT). Physical therapists are recognized as experts in movement and function who treat patients of all ages in many different settings. Graduates of the CU Physical Therapy Program are prepared to collaborate with other health care providers to meet the musculoskeletal, cardiovascular, and neuromuscular needs of patients through direct access to care.

The CU Physical Therapy Program, most recently was ranked 13th out of 217 accredited physical therapy programs in the United States by U.S. News and World Report (2020), is one of the first 25 educational programs still in existence in the United States. This program has been continuously accredited since its inception in 1947, receiving an unconditional ten-year accreditation in 2020. The program celebrated its 70th anniversary in 2017 with a highly successful series of events attended by alumni, colleagues, and business leaders.

Mission

To lead discovery and innovation to improve movement, participation, health and wellness for individuals and society through excellence in education, research, clinical care, and service.

Vision

To transform health and foster wellness in individuals and society through education, discoveries, engagement, and innovation.

Values

Respect: For all individuals' safety, rights, dignity, and perspectives

Integrity: Because professional behavior reflects who we are

Altruism: In service to the individual, community, and organization

Diversity: For inclusivity in all endeavors

Accountability: To all those seeking care and providing care within our profession and health care systems

Passion: Because we are committed to lifelong learning, service, and community engagement

Collaboration: To leverage collective input from all individuals

Leadership: Within the university, profession, and community at large

Quality: To attain excellence in all we do

Applicants to the CU Physical Therapy Program

Applicants to the CU Physical Therapy Program come from a wide range of academic backgrounds. There are minimum prerequisites, similar to those for the MD Program, that emphasize basic sciences, quantitative ability, and psychology. In addition, many of the applicants have substantial experience in health care-related professions. Some have advanced degrees, and all have observed or worked in paid health care-related positions in physical therapy settings in preparation for application to the CU Physical Therapy Program.

Application Data 2020-2021

- Completed Applications: 988
- Interviewed: 210
- Enrolled: 71
- GPA: 3.43
- GRE Verbal: 154 (64%)
- GRE Quantitative: 153 (47%)
- GRE Written: 4.3 (69%)

Students of the CU Physical Therapy Program

Approximately 70-74 students enter the CU Physical Therapy Program each year. Just under half of the students are from Colorado, while other students are accepted to the program from across the United States and from other countries. Students enter this program with high qualifications and graduates of the program pass a national licensure examination with scores well above the average for the United States.

The 2021 entering class of physical therapy students are exceptionally qualified academically and have life experiences that enhance and enrich the body of students. Among this cohort, many students have had extraordinary research accomplishments and valuable volunteer experiences. Some of these experiences include working with individuals with physical or behavioral challenges, from childhood through adulthood. This cohort also has noteworthy physical endeavors such as volleyball, triathlons, lacrosse, cheerleading, and running as well as honorable service to their communities, including disadvantaged communities around the world. Four members of this class have served in the United States military. Some students have come from other professions, such business, teaching, and the arts. More specifically, there are students who excel in dancing, music, and guiding others in fitness.

The program is deeply committed to increasing diversity within the program, and ultimately the physical therapy profession. The admitted Class of 2023 is comprised of 17% from a rural area, 24% first generation, and 23% who identify as an underrepresented minority. Seven students have Hispanic backgrounds, six students identify as Black/African American, one as a Pacific Islander and two students identify as two or more races/ethnicities. Other specific demographic data is included below.

Demographics of Admitted Students

Class:	2021	2022	2023
Female	62%	65%	80%
Male	38%	35%	20%
CO Resident	48%	45%	44%
Non-Resident	52%	55%	56%
Minority	25%	26%	23%
Average Age	25	24	24
Cumulative GPA	3.64	3.66	3.43
Math/Science GPA	3.65	3.61	3.61

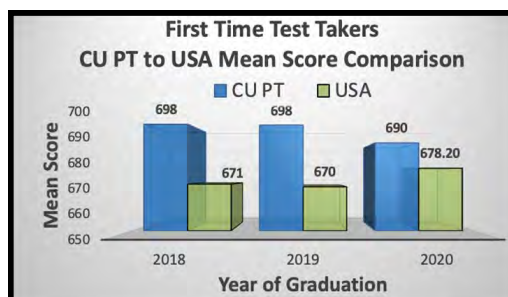
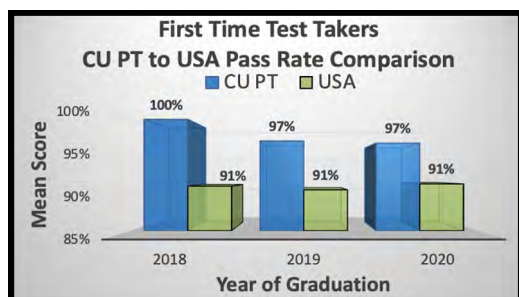
Graduates of the CU Physical Therapy Program

Graduates from the CU Physical Therapy Program perform exceptionally well on the national licensure examination, administered by the Federation of State Boards of Physical Therapy (FSBPT). Since 2014, 98% of our graduates have passed the exam on their first attempt, with 98% of our last four years of graduates having passed the exam on their first attempt. Graduates are employed in settings that range from outpatient to inpatient facilities and include patient populations that span pediatrics to geriatrics.



FEDERATION OF STATE BOARDS OF PHYSICAL THERAPY

Summary of scaled results based on FSBPT criterion-referenced passing score of 600.



Faculty

Faculty of CU Physical Therapy are innovative as leaders in physical therapy education and practice. Faculty are highly committed to the education of the CU PT students. They are experienced educators, many of whom contribute to clinical care. Many faculty members are recognized both nationally and internationally for their scholarship. All are members of the American Physical Therapy Program Association (APTA) where they serve in leadership roles, including on the Board of Directors of APTA and as President of the Cardiovascular and Pulmonary Section of APTA. They also serve other professional organizations, including as members of NIH grant review sections and committees, as well as service to the community, including President of Colorado State PT Board, Department of Regulatory Agencies; DAWN Clinic; Stout Street Clinic for individuals who are homeless. Since 2008, the faculty have developed a robust and substantial research agenda with a current research portfolio of over \$15.6 million.

Curriculum

The curriculum is two-and-a-half years in length comprised of seven semesters of didactic coursework and 38 weeks of clinical education. Some students continue in their final clinical experience after graduation in a paid internship. The curriculum prepares students to improve movement, participation, health and wellness in individuals and populations. As such, curricular content is divided into foundational and clinical sciences, patient management and clinical skills, professional development, and clinical education. There is intentional integration between these components through threaded curricular elements (see figure below). Students learn patient management for individuals across the lifespan with musculoskeletal, cardiovascular, and neurologic disorders, as well as physical therapy for patients with a variety of other medical conditions.

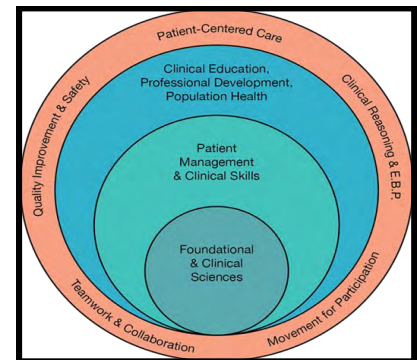
Clinical education experiences occur early and frequently, which allows situational learning and application at several points throughout the two-and-a-half years. The curriculum includes a series of courses focused on developing professional identity, with emphasis on core professional values, effective communication and interpersonal skills, psychosocial aspects of care, clinical reasoning, and evidence-based practice. Students reflect on what it means to be a Doctor of Physical Therapy, leadership and career management, health care delivery systems, and social determinants of health in the context of individual and population health.

Faculty of the CU Physical Therapy Program review and revise the curriculum annually to ensure that content, emphasis, and pedagogy remain current and consistent with changes in the profession and healthcare.

Curricular Threads

The curriculum is carefully designed to integrate five content areas that are threaded throughout the curriculum:

- Patient-Centered Care
- Clinical Reasoning and Evidence-Based Practice
- Movement for Participation
- Teamwork and Collaboration
- Quality Improvement and Safety



CU PT Program Curriculum Threads

Center for Advancing Professional Excellence

The Center for Advancing Professional Excellence (CAPE) provides an innovative simulation environment for students to practice physical therapy examination, intervention, and communication skills. One experience focuses on learning in an ICU environment, and two comprehensive examinations/assessments take place during the first and second years of the program. The Doctor of Physical Therapy Program is one of the few and fortunate physical therapy programs in the United States where students can work with standardized patients and high-fidelity mannequins in conjunction with a full-service Simulation Center of Excellence.

Interprofessional Education

The CU Physical Therapy Program participates in a longitudinal Interprofessional Education (IPE) curriculum, which is designed to prepare students for interprofessional collaborative practice. The curriculum focuses on developing competencies in teamwork/collaboration, values/ethics, and quality/safety. Each student is assigned to an interprofessional student team, which includes students from some or all of the following schools/programs: School of Medicine (Physical Therapy, Medicine, Child Health Associate/Physician Assistant), Skaggs School of Pharmacy and Pharmaceutical Sciences, College of Nursing, and School of Dental Medicine. Over the first two years of the curriculum, the interprofessional student team meets to understand and apply fundamental content in teamwork/collaboration, quality/safety, and values/ethics. In years two and three, students spend an afternoon in the Center for Advancing Professional Excellence (CAPE) to take part in team simulations/standardized patient encounters. Finally, DPT students are evaluated on collaborative practice competencies during their final clinical experience.

Clinical Reasoning Capstone Project

The didactic curriculum culminates in a capstone project. The capstone project includes the writing and presentation of a patient case report that synthesizes the didactic content of the curriculum with the student's clinical experiences, while highlighting the application of evidence-based practice and clinical reasoning.

Research Initiatives

Entry-level DPT students are encouraged to participate in research under the guidance of nationally recognized faculty mentors and present their findings at national scientific conferences and in peer-reviewed publications. Several research facilities are available that enhance the ability of faculty to conduct rehabilitation research and to mentor students who seek to develop research skills while completing their physical therapy education. One facility, the Interdisciplinary Movement Science Laboratory (IMSL), contains state-of-the-art equipment for motion analysis of gait and other functionally relevant tasks. A sister facility in the Geriatric Research, Education, and Clinical Center (GRECC) contains an instrumented treadmill with a motion analysis system that allows intervention and outcome research for populations with walking dysfunction. These motion analysis facilities are also equipped for studies involving electromyography (EMG) and transcranial magnetic stimulation (TMS). The Rehabilitation Science Consortium (RSC) houses graduate students, post-doctoral fellows, research assistants, and physical therapy students who assist with research projects.

Scholarships

The CU Physical Therapy Program is committed to providing sustainable scholarship support to help offset the cost of education to students. Scholarships are available to both prospective and current students and are awarded based on merit, diversity, and commitment to practice in specific locations, such as rural communities. The CU Physical Therapy Scholarship and Endowment Board was formed in 2012 and has successfully increased the PT Program's committed funds from less than \$300,000 in 2011 to over \$5 million. Together, the board, CU Physical Therapy Program leadership, and the Alumni Association have increased the endowment and current use funds to distribute over \$200,000 in scholarships annually.

Pediatric Physical Therapy Residency Program

The University of Colorado Physical Therapy Pediatric Residency Program is an accredited post-professional clinical and didactic education program for licensed physical therapists who have graduated from an accredited DPT program and seek to specialize in pediatric physical therapy. The mission of this residency program is to provide a comprehensive program of didactic, clinical, and professional experiences to develop pediatric physical therapy specialists. Through clinical care experiences, educational excellence, exposure to research, and active engagement in scholarship, teaching opportunities, professional, and community service, and participation in collaborative teamwork, residents will become future leaders in the profession.

The residency program is designed to significantly advance preparation of the pediatric physical therapist as a highly qualified provider of patient care services in multiple, complex clinical practice settings. Future leaders in pediatric physical therapy are developed through coursework and clinical experiences during the 13-month residency program. In addition to clinical opportunities in multiple settings with structured mentorship, the program also includes participation in the Leadership and Education in Neurodevelopmental Disabilities (LEND) program through JFK Partners (www.jfkpartners.org) and access to the resources of the University of Colorado Physical Therapy Program. The American Board of Physical Therapy Residency and Fellowship Education (ABPTRFE) accredits all residency and fellowship programs, and the University of Colorado Pediatric Residency Program is fully accredited through September 2028.

Graduate residents are eligible to take the clinical specialist board examination to be recognized as Pediatric Board-Certified Clinical Specialists by the American Board of Physical Therapy Specialists (ABPTS) in the year following completion of the residency, and thus far, our pass rate is 100%. Clinical sites during the residency include the ENRICH Early Intervention team through JFK Partners, Highlands Ranch Therapy Care Clinic of Children’s Hospital Colorado, Rise School of Denver, Cherry Creek School District, Adam’s Camp, and acute inpatient care in Children’s Hospital Colorado.

Faculty Residency Program

The University of Colorado Anschutz Medical Campus Faculty Residency is a structured, post-professional education program for licensed physical therapists who have graduated from an accredited DPT program who aspire to an academic faculty position. The program is designed to significantly advance preparation of the physical therapist as a highly qualified educator and productive scholar. Potential as a future leader in physical therapist education is developed through multiple teaching experiences, structured mentorship opportunities, and mentored educational scholarship throughout the program.

The mission of the University of Colorado PT Program Faculty Residency Program is to develop competent faculty who are prepared to engage in innovative education by providing a curriculum and mentored experience that supports excellence in the preparation of future healthcare providers and participation in academia. This residency received candidacy status from the American Board of Physical Therapy Residency and Fellowship Education (ABPTRFE) in March 2021 and will seek initial accreditation following a site visit in fall 2021.



Photo courtesy of @colorado_pa_program Instagram, February 16, 2021

Orthopedic Physical Therapy Residency Program

The University of Colorado School of Medicine Physical Therapy Orthopedic Residency in partnership with UHealth is a structured, post-professional education program for licensed physical therapists who have graduated from an accredited DPT program and are seeking specialized training in orthopedic physical therapy. The orthopedic residency will offer experiences in outpatient and classroom settings through the resources of the University of Colorado Physical Therapy Program on the Anschutz Medical Campus and mentorship in clinical patient management in Denver area UHealth outpatient physical therapy clinics. The mission of the orthopedic physical therapy residency program is to elevate the profession and standard of patient care by developing specialized orthopedic physical therapists who demonstrate integrity, excellence, and leadership through innovative evidence-based patient management, as well as professional and community education.

The residency program is designed to significantly advance preparation of the orthopedic physical therapist as a highly qualified provider of patient care services in multiple, complex clinical practice settings. Future leaders in orthopedic physical therapy are developed through coursework and clinical experiences during the 13-month residency program. This residency received candidacy status from the American Board of Physical Therapy Residency and Fellowship Education (ABPTRFE) in June 2021 and will be seeking initial accreditation following a site visit in fall 2021. Graduate residents are eligible to take the clinical specialist board examination to be recognized as Orthopedic Board-Certified Clinical Specialists by the American Board of Physical Therapy Specialists (ABPTS) in the year following completion of the residency.

PhD Program in Rehabilitation Science

Rehabilitation Science is an interdisciplinary and translational field of study that integrates knowledge from the basic and clinical sciences to improve our understanding of human movement, physical function, and disability across the lifespan. Students receive individual mentorship from nationally recognized rehabilitation scientists in state-of-the-art research facilities, with a customized curriculum to meet the interests of each student. Breadth of knowledge is acquired through foundational coursework in research design, biostatistics, and rehabilitation science, whereas depth of knowledge is gained through elective coursework in one of five areas of focus: clinical trials research, health services research, translational research, mechanistic research, and implementation science. This approach prepares students to become independent research scientists who integrate knowledge from multiple perspectives ranging from the molecular to the systems level to solve complex problems of physical disablement that will advance clinical practice in the field of physical rehabilitation.

Students of the PhD Program in Rehabilitation Science are highly successful by many measures, including grants and fellowships awarded to students during their pre-doctoral studies and contributions as co-investigators to investigations that are funded by Foundations and NIH. Students regularly publish peer-reviewed manuscripts, either as first or contributing authors. Since the Rehabilitation Science PhD Program began in 2011, nine students have completed their doctoral work, and 100% of graduates are either completing post-doctoral fellowship training or they have secured faculty positions.

2020 Program Honors

The CU Physical Therapy Program climbed in in the U.S. News and World Report rankings in 2020 from No. 15 to No. 13.

Mike Bade, PT, DPT, PhD, OCS, FAAOMPT and **Jennifer Stevens-Lapsley**, PT, PhD, FAPTA were awarded the Rose Excellence in Research Award from the APTA Orthopaedics Section for their article, *Home-Health-Care Physical Therapy Improves Early Functional Recovery of Medicare Beneficiaries After Total Knee Arthroplasty*.

Lara Canham, PT, DPT, OCS was appointed to the ACAPT's National Consortium of Clinical Educators (NCCE) taskforce on Pre-Admission Observation Hours and Co-Chair of the Colorado Chapter of APTA Awards Committee.

Lisa Dannemiller, PT, DSc, PCS was appointed to the Children's Hospital Colorado medical staff as Allied Health Staff along with **Mary Jane Rapport**, PT, DPT, PhD, FAPTA.

Michael Harris-Love, PT, MPT, DSc, FGSA was appointed Vice Chair of Learning, Development and Inclusion for CU Physical Medicine & Rehabilitation. Additionally, he was appointed as the founding Co-Chair of the Diversity, Equity, and Inclusion Committee for the APTA Colorado Chapter.

Dawn Magnusson, PT, PhD was granted a third year of funding as a scholar in the Comprehensive Opportunities for Rehabilitation Research Training (CORRT) program.

Mark Mañago, PT, DPT, PhD, NCS was granted his initial CORRT K12 award. Mañago was also awarded a pilot grant from the Consortium of Multiple Sclerosis Centers.

Amy Nordon-Craft, PT, DSc and **Jennifer Stevens-Lapsley**, PT, PhD, FAPTA were awarded an NIA Grant investigating COVID-19 recovery.

Mary Jane Rapport, PT, DPT, PhD, FAPTA was invited to join the editorial board of the *Journal of Physical Therapy Education* (JOPTE) for a three-year term. She assumed the role of co-director of the Teaching Scholars Program in the School of Medicine and is a co-investigator on the Defining Excellence in Residency Education: The Next Step in Demonstrating Value study funded by the Academy of Physical Therapy Education.

Eric Sawyer, PT, DPT, OCS, STC was accepted into the Teaching Scholars Program. He was also elected to a three-year appointment on the Academy of Physical Therapy Education Awards Committee.

Jennifer Stevens-Lapsley, PT, PhD, FAPTA was recognized as a Catherine Worthingham Fellow. The FAPTA designation is the highest honor among APTA categories.

Tami Struessel, PT, DPT, OCS, MTC was elected Delegate at Large for the APTA Colorado Chapter.

Tami Struessel and co-authors **Amy Nordon-Craft**, PT, DSc and **Robyn Gisbert**, PT, DPT, were awarded the J. Warren Perry Award for best reviewed article of the year in the *Journal of Allied Health* for their article, "Knowledge and attitudes of physical therapy students across a longitudinal healthcare systems-focused patient safety curriculum."

Meghan Hernandez, PT, DPT, PCS was accepted into the University of Colorado Denver Doctor of Education (EdD) in Leadership for Educational Equity program, with a concentration in professional learning and technology.

Amy McDevitt, PT, DPT, OCS, FAAOMPT and **Paul Mintken**, PT, DPT, OCS, FAAOMPT were invited to be on the authorship team for the *Journal of Orthopaedic & Sports Physical Therapy* (JOSPT) Neck Pain Clinical Practice Guidelines revision.

Mike Pascoe, PhD completed his service on the Healthcare Working Group of the Strategic Planning committee for the University of Colorado System.

Andrew C. Smith, PT, DPT, PhD was granted a second year of funding for his NIH NCMRR R03 Early Career Investigator Award, received a pilot grant from the Department of Physical Medicine and Rehabilitation, and was elected to the nominating committee for the APTA Academy of Neurologic Physical Therapy Spinal Cord Injury Special Interest Group.

Center for Advancing Professional Excellence

The Center for Advancing Professional Excellence (CAPE) is a state-of-the-art standardized patient and simulation center. Working alongside forward-thinking faculty, current and future health care professionals gain access to the latest innovations in teaching and learning. Through simulation experiences, participants learn, develop, and improve patient-centered care. With 18,000 square feet, the CAPE is a unique resource to the Rocky Mountain region. This education environment allows learners to gain real-world experience working with patients, handling clinical situations, and collaborating with fellow health care professionals. The CAPE promotes excellence in the health professions through education and assessment of clinical skills including communication, physical examination, clinical reasoning, and teamwork. We continue to grow and innovate while accommodating more learners and health care professionals. Our community of supporters fuel our efforts to bring a world-class education within reach for current and future health professionals in the Denver metro area, the region and beyond.

Annual Achievements

- Ongoing **accreditation by the Society for Simulation in Healthcare**. The accreditation further establishes CAPE as an international leader within the simulation community in the areas of Teaching, Assessment, Research and Education.
- Successfully adapting many education and assessment sessions for **virtual offerings and exploring telehealth and virtual reality training opportunities** for health professions learners, residents, and practitioners.
- Successfully launching a quarterly **community series** labeled “Being _____ on the CU Anschutz Medical Campus,” which creates a space for diverse communities to speak of their experiences at AMC to inspire understanding and empower collective action.
- Continued partnership with **external partners** like National Jewish Health, Denver Health, Colorado Mesa University, and ACCORDS by offering trainings and research in the areas of communication, teamwork, transition of care and physical exam teaching utilizing simulated professionals and mannequins.
- Continued advanced training of standardized patients capable of providing a broad array of portrayals, physical exam teaching, evaluation, and feedback.
 - ⇒The CAPE employs 65 Standardized Patients (SPs), Standardized Teaching Associates (TAs), Communication Coaches & Facilitators, and Simulation Technologists who represent the diverse population of Colorado. In the past year, **the SP pool provided 27,600 hours of simulation work**. The **CAPE provided over 35,000 learner contact hours for AMC schools**.
- Continued partnership with the **Colorado Department of Public Health and Environment** to administer a competency-based skills assessment for health navigators who serve a diverse population across the state of Colorado. In the past year, **16 health navigators have successfully completed the assessment** and added to the CDPHE registry for current and potential employers to access. Additionally, CAPE collaborated with AHEC and administered the assessment in Durango to be accessible by health navigators practicing in and around the southwest region.

Continued partnership with **College of Nursing faculty to integrate simulated patients in mental health curriculum** for undergraduate nursing students.
- Continued partnership with **Children’s Hospital Colorado** Simulation Lab to integrate simulated patients in additional **boot camp trainings** for interns, residents, and fellows.
- Partnership with the **Center for Personalized Education for Physicians (CPEP)** and faculty from the Departments of Emergency Medicine, Anesthesiology, Neonatology and Obstetrics & Gynecology to offer competency assessment, re-entry to clinical practice, and education services for healthcare professionals utilizing various simulation modalities. In the last year, **CAPE administered 25 assessments from CPEP referrals**.
- Under the leadership of **Kirsten Broadfoot, PhD**, and in partnership with all health professions on campus, ongoing implementation, evaluation, and dissemination of a **Communication Toolbox** for the purpose of improving and standardizing assessment of communication skills across all health care professions.

Ongoing **community engagement** through connections with campus partners and local organizations.

Program Information <https://medschool.cuanschutz.edu/cape>

Elshimaa Basha, MPH, CHSE Director	Kirsten Broadfoot, PhD Communication Skills Development, Research & Remediation Specialist
Melissa Giardina, BA Business Specialist Brena Jones, BA Simulation Services Specialist Rebecca Vollmer, BA Administrative Assistant	Brian Kelly, MS Simulation Education & Technology Specialist Jedidiah Jensen, BA Simulation Specialist
Jocelyn Blake, BA, Monica Dionysiou, MFA, Tanya Russell, PhD, and Devra Keyes, MS Simulation Education Specialists	Jocelyn Blake, BA Community Relations and Communi- cations Manager

Undergraduate Medical Education

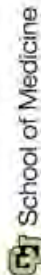
The Undergraduate Medical Education (UME) office oversees students entering medical school with the goal of earning the Doctor of Medicine degree. The students dedicate four or more years to an intensive period of study, clinical rotations, and personal growth. The Undergraduate Medical Education office is responsible for guiding the students throughout their journey to become a doctor of medicine. The process begins with selecting the students who are personally and academically prepared to make the journey. The students receive counseling, financial/career advising, a rigorous curriculum in basic and clinical sciences, state-of-the-art experiences in simulation, rigorous assessments, and technological support throughout their medical school experience. This section of the Facts and Figures book will review some activities in each of these areas for the 2020-2021 academic year. <http://medschool.ucdenver.edu/MDDegree>

Following the successful visitation by the Liaison Committee on Medical Education (LCME) in March 2017 our undergraduate medical education team decided, with encouragement from Dean John J. Reilly, Jr., MD, to embark on a process to revise our curriculum focusing on preparing our graduates for the future of medicine, science, and health systems. On October 30, 2017, Senior Associate Dean for Education, Shanta M. Zimmer, MD led a kickoff retreat for the process. With approximately 150 participants, this introductory event served as a catalyst to share ideas and begin the hard work of deciding how our curriculum can be redesigned. We chose the principles of **leadership, curiosity, and commitment** required for our future graduates to practice compassionately and skillfully in the ever-changing health care systems and communities of tomorrow as superb clinicians, innovative educators, and creative investigators. Following the retreat, more than 25 committees have worked tirelessly to plan an innovative new curriculum focusing on the pillars of Leadership, Curiosity, and Commitment. Faculty throughout the School of Medicine led these committees, with membership of students, staff, clinicians, scientists, and community members, who worked diligently over the past few years to build the Trek curriculum. Trek integrates basic science elements longitudinally throughout the academic careers of our students to prepare them and to enhance their personal and professional development as clinicians.

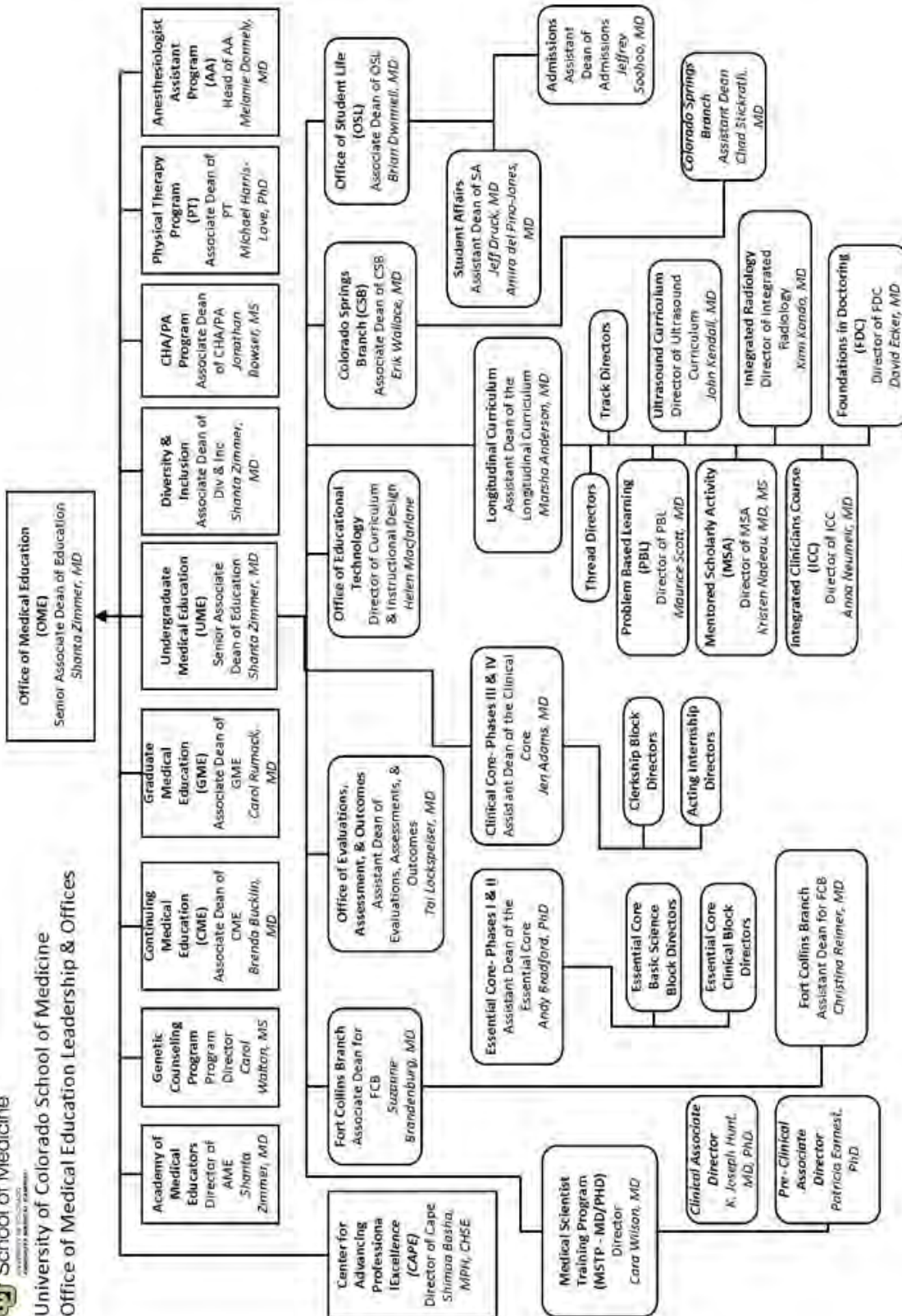
The Plains is comprised of foundational experiences that take students through preclerkship integrated basic science curriculum, clinical skills training, preceptorship, and coaching. After completing their summer discovery period, students transition to the Foothills where they will participate in Longitudinal Integrated Clerkships (LICs). In the Treeline portion of the curriculum, students will work through advanced science courses and USMLE 2 and 1. Students will then find more individualized paths, called trails, which include electives, dedicated research and discovery, acting internships, critical care experiences, and health systems science in the Alpine Ascent. Lastly, our students will reach the Summit of their undergraduate medical education, where they transition to residency preparation and the match process. Implementation of the Trek Curriculum will launch in fall 2021.

In spring 2020, SARS-CoV2 brought unprecedented challenges to the world through the crisis of the global pandemic. Our curriculum team worked closely with Shanta Zimmer, senior associate dean for education, to design and implement a new COVID elective to address the truly translational nature of this new pathogen. The COVID elective course taught basic virology and pathogenesis, as well as pandemic preparedness and the impact of social determinants of health. Additionally, all students were asked to participate in service, education, research, or humanities pillars. Meanwhile, our first- and second-year curriculum was redesigned to fit the virtual learning environment and clinical faculty changed content to match needs of the pandemic, including infection prevention and telehealth. Throughout this time, I was reminded of a quote from our dean, “You think you have a good team, but you never really know until you face a crisis.” Our curricular and student life teams faced dozens of crises in succession this past year and one thing is certain: We have a great team. Lessons learned from 2020 will be with us for years to come, and one of the most important of these is gratitude for the opportunity to create, train, and lead the physicians of tomorrow.

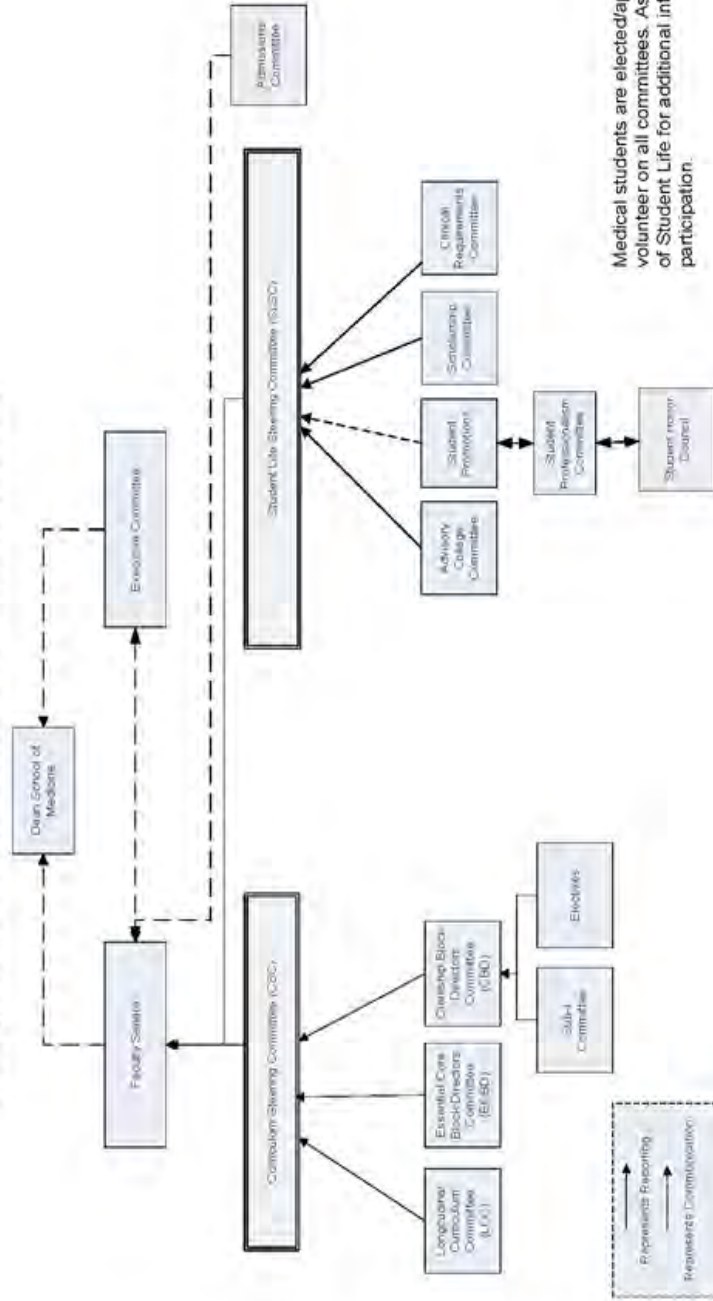




University of Colorado School of Medicine
Office of Medical Education Leadership & Offices



Undergraduate Medical Education Committee Structure



Medical students are elected/appointed/volunteer on all committees. Ask the Office of Student Life for additional information on participation.



The photo above is courtesy of @cumedschool Instagram, April 21, 2021.

Medical Education Resources

More information on the MD curriculum and curriculum reform is available online.

The Teaching RUME (Resources for Undergraduate Medical Education) has materials and reports for faculty and administrative staff: <https://olucdenver.sharepoint.com/sites/TeachingRUME>.

The Trek curriculum reform website provides updates on curriculum planning and pilots: <https://medschool.cuanschutz.edu/education/current-students/curriculum/curriculum-reform>

If you do not have access to the Teaching RUME and would like to, please contact SOM IS and request access on the Medical Education Support tile. <https://medschool.zendesk.com/>

Curriculum Steering Committee

- Chair: Stu Linas, MD
- The Curriculum Steering Committee (CSC) is responsible for the oversight, design, implementation, integration, evaluation, review, and revision of the medical school curriculum. With appropriate faculty input, the CSC will
 - ⇒Oversee the medical education program as a whole, including design, integration, evaluation and improvement;
 - ⇒Guide, review, approve course, block and thread content and educational formats;
 - ⇒Systematically establish the evaluation procedures for curriculum, student, and faculty assessment;
 - ⇒Focus on helping achieve specific curricular outcomes associated with graduating superior physicians;
 - ⇒Periodically review and amend educational policies; and
 - ⇒Recommend, facilitate, and develop procedures to assure that suggested changes to the curriculum are implemented.
- The Curriculum Steering Committee posts all materials on a SharePoint site available to its users.
- Specific accomplishments are outlined in the table below

CSC Accomplishments for FY 2020-2021:

New Members	Class of 2024 representatives: Kayvon Jabbari, Tien Nguyen Clinical Faculty: Tyler Anstett, DO Voting Members: Kayvon Jabbari, Tien Nguyen, Tyler Anstett, DO Ex-Officio Member: Lucinda Allen
Continuous Quality Improvement (CQI) and Phase Reports	<ul style="list-style-type: none"> • Presented to CSC every 2/3 years <ul style="list-style-type: none"> ○Phases 1 and 2 Report ○Phase 3 Report ○Longitudinal Curriculum Report ○CQI reports from several Individual Blocks ○Approved change to CQI process ○GQ ○Intern survey ○EPAC
Key Changes to Curriculum	<ul style="list-style-type: none"> • Reviewed and approved final schedules for Hybrid Curriculum in 2021 • COVID-19 Related Updates: <ul style="list-style-type: none"> ○Oversee remote/on-campus learning ○Eliminated Foundations of Doctoring in P3 ○Changes to Elective in TRES

Oversight	<ul style="list-style-type: none"> ●Approved adjustments to post exam question challenge ●Internship match process ●Scheduled hours compliance process ●Assignment process for P3 ●Student documentation in medical records ●MSTP re-entry process for clinical curriculum ●Branch campuses: Fort Collins and Colorado Springs ●Approved changes to P1, P2 assessment process ●Hybrid class of 2024 ●TREK class of 2025 forward ●Legacy class of 2021-2023 ●Mental health of all classes during pandemic
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Student Life Steering Committee

Chair: Jenny Soep, MD, through 7/30/2021

Deb Seymour, PsyD, Beginning 8/1/2021

Overview

The CU medical school faculty has responsibility for overseeing the medical school curriculum and for contributing significant input and oversight into noncurricular aspects of medical student life. Constructive and systematic evaluation by faculty can be expected to result in thoughtful, consistent, and constructive oversight of selected student life issues such as selection, promotion, advising including financial counseling, mentoring, professionalism, health and well-being, record-keeping, and visiting students. Such oversight may also result in creativity and innovation in adapting to changing aspects of medical student life which will enhance medical student professional development.

In view of a central role for the faculty and the dynamic nature of student life issues, the Student Life Steering Committee (SLSC) is charged with oversight of noncurricular student professional life policies and procedures. The SLSC will work closely with the Senior Associate Dean for Education (SADE), the Associate Dean for Student Life (ADSL), and the Committees of Undergraduate Medical Education to develop, guide, revise, adjudicate, and implement policies and procedures relevant to medical student professional life. Actions of the SLSC will be reviewed by the SADE and the ADSL and reported annually to the Faculty Senate.

During the COVID-19 pandemic the SLSC reviewed proposals and policy changes needed to adapt to the circumstances that had an impact on non-curricular aspects of student life. New members were added to the committee to provide representation from the Ft. Collins branch campus and new student representation from phase 1 and 2, and Student Life Advisory Committee (SLAC).

Charge

To oversee, review, guide, evaluate, recommend changes, review new policies and procedures when appropriate, and assure consistent implementation of established policies and procedures regarding noncurricular aspects of medical student professional life.

- Recommend to the Faculty Senate and Senior Associate Dean for Education changes in policies and procedures relevant to noncurricular aspects of medical student professional life.
- Assist with the development and implementation of policies and procedures that stimulate evolutionary change that optimize medical student professional life and professional development.

- Monitor and constructively respond to data obtained from evaluation and outcome instruments regarding medical student noncurricular professional life.
- Apply relevant Liaison Committee for Medical Education Standards and Elements to ensure that medical student noncurricular issues are monitored, addressed, and updated for standard compliance, and to enhance medical student professional development and well-being.
- Address special student life- and policy/procedure-related issues that arise that are relevant to medical students and are outside the purview of established UME and School of Medicine
- oversight committees.

Reporting Procedures

- SLSC will receive timely reports and updates from the Student Promotions Committee, including the Sub-committee on Student Professionalism, and from the Scholarship Committee, the ADSL, the Clinical Requirements Committee, and the Admissions Committee.
- SLSC will inform the SADE of ongoing issues and activities and report to the Faculty Senate.

Voting Membership

- A clinical and a basic science faculty member involved with medical student activities
- President, Medical Student Council
- A MTSP student
- One medical student representing Phases I or II
- Faculty Senate representative recommended by the President of the Faculty Senate
- Director of Evaluation for Undergraduate Medical Education
- A community-based physician-educator faculty member
- A faculty advisor from one of the School of Medicine's Advisory Colleges
- Associate Dean for Diversity and Inclusion

Nonvoting Membership

- Senior Associate Dean for Education
- Associate Dean for Student Life
- Associate Dean for Curriculum
- Assistant Dean for Student Affairs
- Assistant Dean for Admissions
- Director of Student Life
- Director of Finance and Administration, UME
- Director of Educational Technology
- Associate Dean for Colorado Springs Branch
- Assistant Dean for Fort Collins branch campus
- Student members of SLAC
- Other faculty, students, or administrators with expertise as needed.

Leadership:

The SLSC will be chaired by a senior faculty member with experience in student life activities and appointed by the Senior Associate Dean for Education.

Terms of Appointment:

Faculty members to this committee are appointed for three-year terms. Terms are renewable for one additional cycle of three additional years. Medical and MTSP students are appointed by Medical Student Council to a term of one to four years.

Clinical Block Directors Committee

The Clinical Block Directors (CBD) Committee is responsible for the design, implementation, and assessment of the Phase III and IV medical student curriculum. The committee meets regularly to develop and implement the curriculum.

The following individuals served as Clinical Block Directors in 2020-21: Jennifer Adams, MD, Brandy Deffenbacher, MD, Christopher King, MD, Pearce Korb, MD, Jill Liss, MD, Paul Montero, MD, Amy Reppert, MD, Kelley Roswell, MD, Joseph Sakai, MD, Roberto Silva, MD, Jennifer Soep, MD, Chad Stickrath, MD, Scott Vogel, MD, Eric Young, MD.

Assistant block directors included: Austin Butterfield, MD, Mark Deutchman, MD, Anne Frank, MD, Vera Fridman, MD, Janna Hardland, MD, Teresa Jones, MD, Vishnu Kulasekaran, MD, Juan Lessing, MD, Amy Markese, MD, Mike Overbeck, MD, Meghan Treitz, MD, Juliana Wilson, MD.

Jennifer Adams, MD, is assistant dean of medical education and clinical curriculum and is responsible for planning, management, and leadership of Phases III and IV. Chad Stickrath, MD, is the director for Phase IV. Jennifer Soep, MD, is director of acting-internships and the chair of the Phase IV Task Force.

Essentials Core Block Directors Committee

The Essentials Core Block Directors (ECBD) committee (comprised of 20 Block Directors, student representatives from each year and the MSTP, and *ex officio* members) meets monthly to review Block challenges, performance, innovations, evaluations, and student feedback, along with Essential Core policies. Each Block undergoes continuing quality improvement review on an annual basis. This past year, the ECBD continued to work on improving assessments and providing NBME Board style practice questions for students, integrating an online content resource and question bank into the Essentials Core Blocks. ECBD also implemented the transitional 'hybrid' curriculum, modifying the existing interdisciplinary blocks, to facilitate the switch to the new Trek curriculum in 2021 and optimize the learning environment and experience for the incoming Class of 2024. The COVID-19 pandemic required most classes and assessments to be online. Live Zoom lectures and small groups were offered and additional office hours and meetings with student representatives added to support students and obtain real-time feedback. Best practices were identified to be carried forward to subsequent blocks and communicated to TREK leadership. A return to in-person classes is anticipated for the last iteration of the legacy curriculum in the fall. ECBD works with the Office of Student Life to identify and support struggling students and improve the learning environment. ECBD is well-represented on curriculum reform and implementation committees, and members are piloting new educational and assessment strategies in preparation for implementation of the next generation, integrated School of Medicine Trek curriculum. The ECBD committee provides a venue for communication between block directors, faculty, staff, and students, and coordination with the Clinical Core, Longitudinal Curriculum and Electives, across all four phases of the MD program. ECBD is chaired by the Assistant Dean for the Essentials Core Andrew Bradford, PhD, and reports to the School of Medicine Curriculum Steering Committee.

Essentials Core: Phase I and Phase II

The Essentials Core curriculum consists of nine integrated, interdisciplinary blocks that present basic science in a clinical context and are each directed by a basic scientist and a clinician. Andrew Bradford, PhD, Assistant Dean, oversees the Essentials Core. Each block lasts approximately eight to ten weeks and consists of lectures, team-centered learning, problem-based learning sessions, laboratory exercises, and small group discussion sections to prepare students for entry to the clinical blocks during their third year. Students also begin working on their Mentored Scholarly Activity (MSA) during Phases I and II, and are able to choose from electives to personalize their curriculum, and explore interests outside the standard curriculum. The students begin to learn basic communication and physical exam skills during the Foundations of Doctoring course that provides early exposure to clinical practice and emphasizes a humanistic approach to medical care. Woven through the Essentials Core blocks, and the clinical blocks that follow them, are longitudinal elements or threads that integrate behavioral and social sciences, informatics, evidence-based medicine, health care policy, culturally effective medicine and ethics, and professionalism into the curriculum. Marsha Anderson, MD, assistant dean, oversees the longitudinal curriculum. The overarching goal of the Essentials Core is to provide the scientific foundation and critical thinking skills for our students' future medical education and to equip them for a lifetime of learning, research, clinical care, and community service. The Essentials Core will end December 2021 with the transition of the class of 2024 to their clinical clerkships.

Clinical Core: Phase III

The Clinical Core Curriculum consists of competency-based clerkships that provide opportunities for mastery of the core knowledge, skills, and attitudes required of physicians. The curriculum provides intensive clinical experiences in the hospital, ambulatory clinics, emergency room, labor and delivery suite, and operating rooms. Several opportunities are available for third-year students to increase continuity and authenticity of clinical experiences. These include the Longitudinal Integrated Clerkship at Denver Health (DHLIC), the Colorado Springs Branch Longitudinal Integrated Clerkship (COSMIC), the Colorado Community Longitudinal Integrated Clerkship (CCLIC) in rural Colorado, the VA Sequential Training (VAST) Program, and the Fort Collins Longitudinal Integrated Clerkship in connection with Colorado State University. For each clerkship (both block and longitudinal), goals and learning objectives have been developed by the Clinical Block Directors (CBDs) to reflect the clinical experiences and are mapped to ACGME competencies. In addition, overarching medical education program objectives have been developed by a consensus-based process. These objectives are defined in outcome-based terms that allow assessment of medical students' progress in developing competencies to be achieved at the time of graduation. These objectives reflect the expectations of physicians by the profession and the public.

Students use learning logs to record conditions observed, diseases, and procedures. Low- and high-stakes assessments have been incorporated into each clerkship or block. Shelf exams or block-developed medical knowledge exams, clinical evaluations, mid-point feedback sessions, mid- or end-of-block standardized patient exams and clinical practice exams provide additional opportunities for assessment of students' clinical performance and opportunities for feedback on student performance. Clinical block directors monitor students' clerkship experiences at all clinical sites.

Group Accomplishments

During the 2020-21 Academic Year, the CBD committee accomplished the following initiatives: Continuous quality improvement with in-depth review and discussion in workshop format of the following areas involving all courses: Clinical Teaching, Sub-Optimal Learning Environment, Mistreatment, Didactics, Orientation, and Unique Curricular Innovations.

- The ongoing COVID-19 pandemic required continued tremendous flexibility, adaptability, and changes to the clinical curriculum. Among the accomplishments:
 - a. Meetings continued in a virtual format
 - b. Continued integration of online modules and telehealth into clinical training allowing adaptability and achievement of clinical competencies.
 - c. Accommodated a huge number of students returning to the clinical environment in June and July 2020 because there were students overlapping from two classes. Other factors affecting the students' return were low patient volumes; a lack of PPE, which limited patient exposure; and hospitals that were willing to accept students. The virtual clerkship materials continued to be used to offload clinical sites and make this implementation possible.
 - d. The Phase III curriculum was shortened by four weeks due to the COVID-19 pandemic requiring overlapping clinical blocks which also increased student volume dramatically at the end of the academic year. Accommodated over-/under-enrolled blocks by splitting some courses.
 - e. Course directors and support staff remained continually responsive to evolving public health and hospital guidelines around the pandemic to maintain student safety and optimize clinical learning. Maintained students in the clinical training environment through the fall and winter surge of COVID infections and hospitalizations. This was made particularly challenging as many non-affiliate partners shifted to not accepting learners in the fall.
 - f. More physical exam teaching required of clerkships as foundational skills were unable to be taught in person as Foundations of Doctoring curriculum was virtual.
- A Telehealth Curriculum Director was named in response to recommendations from the Telehealth Task Force, convened in April 2020 in response to the COVID pandemic and in recognition that training of students and faculty in learning and teaching telehealth was a new imperative. Under this new curricular initiative, telehealth curriculum and content were introduced into the essentials core (PBL), ICC 7001, ICC 7003, ICC 8005, Community and Primary Care Clerkship, Psychiatric Care Clerkship, and all LICs. A telehealth elective was developed and implemented for Phase III students and will be offered as a Phase IV elective in future years. Faculty development materials were developed and disseminated to all clinical faculty.
- Developed a new process to standardize student requests for shelf exam delays. With this new process, all shelf exam delay requests are now centralized through Office of Student Life, if the request is due to illness or emergency within 48 hours of the exam it will likely be approved, other requests will likely be denied if the student is able to continue clinical work.

- Significant attention was paid to bias in grading and disparities among student groups (URiM and gender) related to grades. Bias training was implemented and required for all members of clerkship grading committees. Individual committees reviewed course grading data related to URiM and gender differences and discussed possible reasons for differences among groups and strategies to mitigate bias.
- Created a four-week selective block for the Class of 2024 in the final legacy year of the curriculum. This filled a gap in the curriculum that had been created when time was cut from clerkships the year prior due to COVID restrictions. Fourteen selective courses were offered each block, allowing students to individualize education in the third year, seek career exploration opportunities, and allowing course directors to pilot elective curricula as they planned for Alpine courses in the Trek curriculum.
- Conducted a fully virtual Phase III Orientation including introduction to the specialty TikTok-style videos produced by and starring CBDs and student reps.
- Implemented standardized grade sheets calculating numeric scores for clerkship grading. Deans observed most grading committee meetings. Revised clinical grading best practices and grading cut-off scores.
- Developed a standardized process/algorithm for all blocks when considering grades for end-of-year review, with target of 10% of grades to shift higher with standard review (separate from the appeal process). Every grade systematically reviewed for grading discrepancy; those close to grade cut-offs had comments re-reviewed and grades were adjusted accordingly. For the 21-22 academic year, this process will begin at the start of the academic year allowing identification of students and assuring 10% room for adjustments at the end of the year.
- Revised criteria for each clerkship grade to provide students with increased clarity and transparency around clinical grading.
- Revised and clarified expectations for professionalism in clerkships and penalties related to grading for infractions of varying degrees and repetitions.
- Revised grade appeals policy to put limitations on requests for additional feedback to be sought from supervisors who had already submitted assessments, limiting requests only to those supervisors who had not submitted an assessment that was thought to be critical by the student to their grade determination. Additional clarification added that appeals could result in both a raising or lowering of the final grade.
- Development of a Block Clerkship to LIC Handbook to ensure a smooth transition of knowledge between course directors and leaders during the curriculum transition.

Post-clerkship Curriculum

The mission of the post-clerkship curriculum is to utilize unique clinical and non-clinical courses to develop well-rounded physicians who are prepared to be excellent house officers and leaders who are curious, life-long learners with a commitment to serve the profession, our patients, and society.

The curriculum consists of 32 weeks of educational requirements, including a required four-week Acting Internship, two 2-week Integrated Clinician Courses, 24 weeks of elective time and a capstone presentation of students' Mentored Scholarly Activity projects. Working with the Office of Student Life, the post-clerkship curriculum is designed to foster: 1) knowledge base and skill development; 2) career preparation/development; and 3) professional identity formation in an individualize manner for each student.

The post-clerkship curriculum is led by:

Chad Stickrath, MD, FACP
 Associate Professor of Medicine
 Assistant Dean for Medical Education, Director of Post-clerkship Curriculum
 University of Colorado School of Medicine

Jena James, MEd
Electives Coordinator
University of Colorado School of Medicine

More information about the post-clerkship curriculum can be found at:

<https://medschool.cuanschutz.edu/education/current-students/curriculum/longitudinal-curriculum/elective-curriculum>

Foundations of Doctoring Curriculum

The Foundations of Doctoring Curriculum (FDC) is a two-year longitudinal experience beginning in Phase I of medical school that teaches communication, physical examination, clinical reasoning, and professional development skills. The vision of FDC is to prepare medical students to be outstanding physicians who will care for our diverse society. Standardized patient encounters and regular clinical exposure in a physician preceptor's practice are key components of this curriculum. Course Director **David Ecker, MD**, and the Associate Course Directors **Deb Seymour, PsyD** (Communication), **Brandy Deffenbacher, MD** (Physical Exam), **Todd Guth, MD** (Clinical Skills), and **Kristin Furfari, MD** (Preceptorship), continue to develop and produce a dynamic, integrated curriculum of foundational clinical and professional skills and experiences that equip students for their clinical years. The curriculum is aligned with material taught in the Essential Core Curriculum to encourage integration of classroom learning into clinical practice.

If you are interested in volunteering as a preceptor for the Foundations of Doctoring Curriculum, which will be renamed Developing Our Clinical Skills (DOCS) for the Trek Curriculum beginning AY21-22, please email

Foundations.Doctoring@cuanschutz.edu.

Integrated Clinicians Course

First implemented in 2008, the Integrated Clinicians Course (ICC) is an eight-week longitudinal curriculum during one or two-week blocks of time throughout Phases III and IV. The course is designed to integrate multiple concepts into students' clinical experiences, such as advanced clinical and communication skills, translational basic science, medical-legal topics, medical errors and quality improvement, ethics and professionalism, scholarly activities, and career development and exploration. Led by Anna Neumeier, MD, and Matt Rustici, MD, the ICC curriculum is currently undergoing transformation into the Trek Basecamp Curriculum. The Basecamp Curriculum is a longitudinal curriculum delivered at three intentional points of clinical transition: prior to the clerkship year, prior to the advanced clinical year, and prior to graduation. As such, through cultivation of continuous self-advancement, students solidify and advance relevant knowledge and skills required for their next stage in training. As they advance, their content learned will become more complex and differentiated and will map toward their individualized specialty of practice. Through this iterative reform process, students in the Legacy, Hybrid, and Trek curricula will receive components of this new basecamp curriculum within the Integrated Clinicians Course. In 2020-21, the ICC/Basecamp curricula were delivered through a hybrid in-person and virtual format to optimize safety during the COVID-19 pandemic as well as provide opportunity for high-fidelity simulation and in-person skills learning. The course appreciates its 400 instructors who contribute over 1200 hours of direct teaching time. For more information visit the ICC website and Transition to Residency Course website at <https://medschool.cuanschutz.edu/education/current-students/curriculum/longitudinal-curriculum#ac-integrated-clinician-course-icc-2> and the <https://www.tteducators.com/program-descriptions/univ-of-colorado>.

Medical Student Research Track

Leadership: Allan Prochazka, MD, MSc--Director of Medical Student Research Track, Professor of Medicine

The Research Track aims to foster development of an identity as a physician capable of being involved with and completing all aspects of a research project from the identification of a health care-related scientific question to the written dissemination of scientific information as a first author on a manuscript developed for submission. Since its inception in 2007, 250 students have completed the track, with 56 currently enrolled in the program (18 in the Class of 2022, 17 in the Class of 2023, and 21 in the Class of 2024). The 59 students participating since 2017 have published 100 papers thus far, and 75% of those students have published at least one paper.

Students work with an experienced faculty mentor through all four phases of the School of Medicine curriculum, including two full-time research months in the summer after the first year, and two additional full-time research months during their fourth year. Preliminary and final results are presented locally, regionally, and nationally. In addition, the track provides seminars related to research ethics, and teaches students how develop polished, professional research presentations and papers. Research Track students will be prepared to continue to work as researchers during their residencies and future medical careers.

The Research Track relies on the generous funding support of the following departments and endowments. Funding sources commit to support a student through their four years as a Research Track student, which includes four months of stipends for full-time work, as well as travel to present at the Western Student Medical Research Forum and one national meeting in the student's area of specialty.

Funding Department or Source	Students sponsored in 2020-2021
Anesthesiology	4
Biochemistry and Molecular Genetics	1
Cancer Center	6
Center for Regenerative Medicine and Stem Cell Biology	0
Child Psychiatry	2
Data Science to Patient Value (D2V)	1
Immunology and Microbiology	1
Medicine	7
Neurology	4
Ob/Gyn	5
Orthopedic	7
Ophthalmology	5
Pathology	0
Pediatrics	10
Radiology	1
Physical Medicine and Rehabilitation	1
Schweppe Endowment	10
Surgery	8

Health Sciences Student Research Forum

The 35th Annual Student Research Forum was held January 11, 2020. The forum was organized and funded by the School of Medicine Dean's Office and overseen by Allan Prochazka, MD, MSc, director of the Colorado Research Track. One hundred five students presented their research from across the Anschutz Medical Campus, representing the School of Medicine, Skaggs School of Pharmacy and Pharmaceutical Sciences, School of Dental Medicine, College of Nursing, School of Public Health and the Graduate School. Over 80 faculty members volunteered their expertise to judge posters. Approximately 148 first-year medical students also evaluated posters as student judges. A total of \$15,680 in award money was given to the 42 highest-scoring presentations in the form of \$320 monetary prizes.

Research Track Student Awards and Honors

Western Student Medical Research Forum

Eighteen Research Track students from the Class of 2023 presented at WSRMF in late January 2021 via Zoom. One student, Michal Schafer, was honored with the Mead Johnson WAFMR award.

Gates Foundation PhD Award

Kumar Thurimella won a scholarship from the Gates Foundation to pursue a PhD at Cambridge University.

Schweppe Outstanding Scholars

The Schweppe Scholars Program, funded by the Schweppe Foundation, is designed to support outstanding CU School of Medicine students from each class cohort in the Research Track. Support continues through all four years at SOM. AY 2019-2020 Schweppe Scholars were:

Diana Clabots, Tiffany Cung, Derek George, and Pierce Lewien	Class of 2020
Alexis Sunshine	Class of 2021
Christian Curran, Alyssa Shepherd, Sophia Wolfe	Class of 2022
Salman Ashraf, Zihan Feng, Emmeline Kim	Class of 2023
Bruck Gezahegn, Joy Huang, Preston Le	Class of 2024

Problem-based Learning

Maurice C. Scott, Jr., MD, is director for Problem-Based Learning (PBL). The PBL curriculum runs over the first two years of medical school. Each class is divided into groups of eight students who meet with one facilitator for 28 two-hour sessions. PBL cases are designed to improve skills in clinical reasoning, communication of medical information, self-directed learning, and research strategies to answer clinical questions. Groups also discuss how ethics, professionalism, cultural differences, and medical systems affect the care delivered to patients. PBL helps students develop skills in a safe and constructive environment where they learn how to “walk and talk like a doctor” before they start their clerkships. Faculty and volunteer community clinicians facilitate the PBL group discussions and are recruited prior to the start of a new academic year. PBL is consistently one of the highest-rated courses in undergraduate medical education. For further questions, please contact the PBL Director Maurice Scott at maurice.scott@cuanschutz.edu or visit:

<https://medschool.cuanschutz.edu/education/current-students/curriculum/essentials-core#ac-problem-based-learning-9>

Mentored Scholarly Activity Program

The Mentored Scholarly Activity (MSA) program is a required longitudinal curriculum across all phases for all School of Medicine students. The goal of the MSA curriculum is to foster self-directed, life-long learning over the course of the medical student career. The MSA requires students to identify and work with a mentor to complete their projects, which also prepares them for working with mentors in their careers and serving as mentors to others in the medical profession. The MSA program has a broad definition of scholarship, and students can choose a project that represents their interests. Projects culminate with a scholarly paper and a Capstone poster presentation in the spring of the students’ graduation year.

The 2020-2021 MSA leadership team and their topic expertise consisted of **Kristen Nadeau, MD, MS** director (clinical research), **James Maloney, MD**, associate director (clinical research), **Leana May, DO MPH**, associate director (global health), **Daniel Goldberg, JD, PhD**, associate director (bioethics, humanities, arts and education), **Rita Lee, MD**, and **Sarah Rowan, MD** associate directors (public health and epidemiology), and **John Tentler, PhD**, associate director (basic biomedical science). Over 420 CU faculty members currently serve as mentors. MSA has partnered with the Colorado School of Public Health to work with the Colorado Biostatistics Consortium to assist medical students with their study design and data analysis. Librarian liaisons at the Health Sciences Library provide expert consultations for literature reviews tailored to the student’s project topic. Thirty-four percent of MSA students have either published or had a manuscript accepted or pending publication. For the graduating Class of 2021 Capstone Poster Forum Event, approximately 83 faculty members volunteered to evaluate the posters of 171 student presenters, and each student evaluated posters of their peers.

For more information on becoming a volunteer faculty mentor, please contact the MSA program, at MSA.SOM@cuanschutz.edu. (Website: <https://medschool.cuanschutz.edu/education/current-students/curriculum/longitudinal-curriculum/mentored-scholarly-activity>)

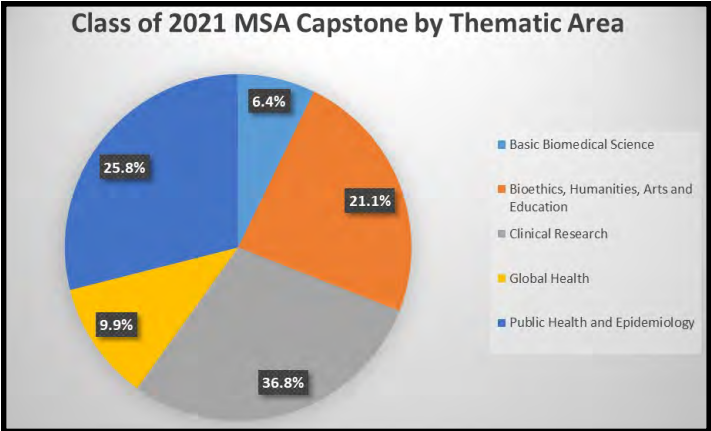


Figure 1: MSA Projects by Thematic Area, Class of 2021 N=171

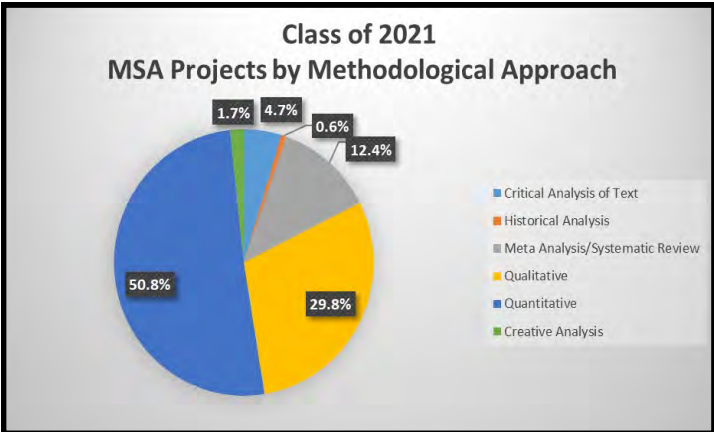


Figure 2: MSA Projects by Methodological Approach, Class of 2021 N=171

Education Technology

During the past year, the educational technology team of the Office of Medical Education (OME) integrated with SOM Information Systems. The combined group (Ed Tech and OME) continued maintenance and support of the technologies of the MD program and undertook a range of new projects.

- Increased support and innovation for the electronic curriculum delivery to accommodate the needs due to pandemic restrictions.
- Updated student information database and interface for the Office of Student Life.
- Assessment, selection, and the first phase of implementation of a new learning ecosystem called North Star, which will include the functions of a learning management system, curriculum management system, student assessment, course evaluation, and clinical experience tracking when fully implemented.
 - ⇒ This system is being designed to meet the needs of the Trek curriculum.
 - ⇒ Development of new processes with stakeholders to use North Star and meet the business needs of the program.
 - ⇒ Continued support of the systems of the Legacy and Hybrid curricula.
- Implementation of H5P, an online tool used to create and deliver interactive curricular content, which is integrated into North Star.
- Pilot of the longitudinal integrated clerkship lottery which will continue to be developed for the Trek Foothills.

Office of Assessment, Evaluation and Outcomes

This year, the UME Office of Assessment, Evaluation, and Outcomes (AEO) continued to work toward our mission of creating a data-driven culture that promotes growth and improvement of students, faculty, curricula, and the learning environment. We have continued to hire additional faculty and staff to help with the mission of the office, prepare for curriculum reform, and continue to support our current curriculum.

Assessment Accomplishments

The primary assessment goal of the AEO Office is to create a coordinated program of student assessment that promotes best practice and clearly facilitates student growth. During Academic Year 20-21 assessment activities included:

- Content and psychometric validation for the Essentials Core assessments
After administration, all questions undergo a statistical review to ensure adherence to psychometric guidelines. Any questions not meeting these guidelines are reviewed by content experts to determine whether they are accurate and test important knowledge that was covered during instruction. All flawed questions are removed before final scoring, which increases the validity of exam results.
- Dashfolio
The AEO Office continued development of a student Dashfolio that displays a student's Essentials Core exam performance across the various disciplines and systems aligned with the USMLE content outline. Feedback from the AY 19-20 Pilot was incorporated to improve the Dashfolio in preparation for a full roll-out of the student Dashfolio in 2021 with the Trek curriculum.
- Standardizing the approach to grading in Phase III
To continue improving the transparency and fairness of grading in the clinical rotations, the AEO Office created and implemented a new standardized approach to calculating and assigning grades in the clinical courses. To adjust to this new model, the AEO office provided detailed instruction and feedback to the clerkships throughout the year.
- Implemented virtual proctoring for all multiple-choice exams due to COVID-19
Due to the COVID-19 pandemic, in-person testing was not possible. The AEO Office executed a plan for virtual proctoring that allowed our students to continue taking these important exams in a secure testing environment. Test security is critical to ensure that test results accurately reflect student ability. All Phase I, II, and III (NBME exams) were proctored virtually during AY 20-21.

- Preparation for curriculum reform

As the Trek curriculum launched in fall 2021, much of AY 20-21 was spent developing a robust program of assessment for the entire medical school, and in particular revamping and refining all multiple-choice questions that will be used in the preclinical phase of the new curriculum. Twenty-six specific outcomes for the Trek curriculum were created and vetted by a large group of diverse faculty and students and will be used to assess student progress in the new curriculum.

Evaluation accomplishments

To support the continuous quality improvement of the educational program, the AEO Office collects, synthesizes, and reports de-identified, quantitative, and qualitative student data to promote faculty growth and curricular improvement. During Academic Year 20-21, students completed 13,060 course and 68,336 teaching evaluations administered by the AEO Office. Routine reporting activities included

- Producing Continuous Quality Improvement (CQI) reports and Clinical Core Dashboards The AEO Office generated 37 CQI reports, one for each required course, block, clerkship, and thread, for annual presentation at one of the three curriculum sub-committees and biannual presentation at the Curriculum Steering Committee (CSC). AEO continued to produce individualized dashboards for each clinical course to provide visual representation of the data and facilitate comparisons across courses and years. In the clinical core, members of the AEO Office meet individually with each course director to review their feedback and help in creating a plan for improvement for the next year.
- Generating and Distributing Faculty and Resident Teaching Reports All faculty and residents receive a teaching report if they have been evaluated by at least three students. For university-affiliated faculty who teach students, the AEO Office uploads the summary teaching evaluation directly into PRISM. The AEO Office distributed approximately 1,323 attending and preceptor evaluation reports and 716 resident evaluation reports to residents and their program directors at the 52 residency programs at School of Medicine, Denver Health, Exempla St. Joseph's, and HealthOne-PSL.

The AEO Office supports program development efforts and provides special analyses to assist educational activities and curricular program decision-making. During AY 20-21, other AEO activities included

- Evaluating the Impact of the MD Program Experience The AEO Office collects outcomes data annually via "End of Phase" surveys that are administered to all students at the end of each year of medical school. The surveys collect valuable feedback about curricular experiences and students' attitudes and beliefs. Some responses are linked across time to see how educational experiences relate to future plans. In addition, the AEO office analyzes and reports on the results of the AAMC Graduation Questionnaire to compare the student perceptions of School of Medicine with those of other medical schools around the country.
- Student Data Advisory Committee The Student Data Advisory Committee (SDAC), led and managed by the AEO Office, oversees all research using medical students as subjects. This committee is composed of representatives from the AEO Office, the Office of Student Life, the Office of Medical Education, and an appointed student representative. The committee reviews all surveys and requests for data. Approved surveys are emailed to students in bi-weekly digests, and requests for data are fulfilled by the AEO Office.
- Providing educational research support to students and faculty The AEO Office regularly works with students and faculty to support their research projects and collect high-quality data from medical students while protecting anonymity. The AEO Office support in this arena is broad-ranging and many of the studies that are ultimately approved by SDAC receive considerable input and advice from a member of the AEO Office.
- Evaluating impact of curricular changes secondary to COVID-19 With the ongoing COVID-19 pandemic, numerous educational changes occurred in Academic Year 20-21. The AEO Office worked with numerous faculty and students to evaluate these changes and provide more real-time feedback to the faculty. Several new surveys, evaluations, and focus groups were created, administered/facilitated, and reported by the AEO Office to support this work.

Summary of AY 20-21 Student Ratings of Courses and Faculty by Phase

Essentials Core Curriculum (Phases I & II)	Mean	
	Phase I	Phase II
"Rate the overall quality of the block"	3.90	3.94
"Overall teaching" rating for lecturers	4.32	4.25
"Overall teaching" rating for small group facilitators	4.52	4.54

(5-point scale, e.g., 1=Unacceptable; 5=Excellent)

Clinical Curriculum (Phases III & IV)	Mean
Core Curriculum (Phase III)	
"What was the quality of the clerkship as a whole?"	4.12
Advanced Studies (Phase IV)	
"What was the quality of the acting internship as a whole?"	4.48
"Rate the quality of this elective as a whole." (<i>Clinical Electives</i>)	4.49
Clinical Teaching Evaluations (combined Phase III and IV)	
"Overall, how effective is this attending's teaching?"	4.67
"Overall, how effective is this resident/fellow's teaching?"	4.66

(5-point scale, e.g., 1=Unacceptable; 5=Excellent)

Assessment, Evaluation, and Outcomes Office faculty and staff include:

Tai Lockspeiser, MD, MHPE – Assistant Dean of Medical Education – Assessment, Evaluation, and Outcomes
 Rachael Tan, PhD – Director of Office of Assessment, Evaluation, and Outcomes
 Erin Broening – Coordinator
 Wendy Christensen, PhD – Statistician
 Sheilah Jiménez – Professional Research Assistant
 Lori Morgan, MA – Evaluator
 Susan Peth – Senior Evaluation Specialist
 Federico Romano – Assessment Specialist
 Traci Yamashita, MS – Outcomes Analyst

The AEO Office website can be found here: <https://medschool.cuanschutz.edu/education/current-students/curriculum/assessment-evaluation-and-outcomes>.

Office of Student Life

The Office of Student Life (OSL), which includes both Admissions and Student Affairs, last year was able to build on the addition of Jeffrey SooHoo, MD, MBA, assistant dean of admissions, and Amira del Pino-Jones, MD, assistant dean of student affairs, and this year they were able to showcase why they were wonderful choices to assist in recruiting the best possible medical student candidates and assist our students in achieving their goals. When del Pino-Jones went on maternity leave, Deborah Seymour, PsyD, was appointed in as interim assistant dean of student affairs, bringing a wealth of experience in coaching students on academic success and communication strategies. Led by Brian Dwinell, MD, serving as the associate dean for student affairs, who along with his leadership team, has admirably coordinated the office's challenges during COVID to support students and continue the pipeline of excellence in medical student development. Rounding out the OSL leadership is Jeff Druck, MD, assistant dean for student affairs, and Haylee Shacklock, who manages the staff and workflows needed to make the office as productive as possible.

The mission of OSL is to provide support for applicants and students throughout their cycle with the School of Medicine and to specifically provide multiple levels of support to a diverse group of students to help ensure their academic success and to support their personal well-being. OSL provides services for prospective students, current students, and graduates over the entire spectrum of their time with the School of Medicine and beyond. This starts when a candidate expresses an interest in being considered for the MD program, continues through their matriculation and time as a student, and into their careers as they need support for medical licensing. The office provides guidance, advice, and administrative assistance to applicants and students. The office is responsible for the admissions interview and selection process, monitoring student registration, student progress and graduation. OSL organizes and manages many events including the Second Look Day, the first-year orientation, the white coat/stethoscope ceremony, Match Day, and the hooding and oath ceremony at graduation. With the onset of the pandemic, nearly all large events were converted to a virtual format, which represented unique challenges. OSL converted graduation to a live ceremony over a short timeframe and the ceremony was well received. OSL also instituted regular virtual office hours along with class-specific office hours which were well attended by students and faculty. The isolation that students experienced created many unique mental health and financial issues for some students, which required additional OSL intervention.

OSL provides organization and support for the Student Promotions Committee, which routinely involves complicated student cases. OSL also organizes and supports the Student Life Steering Committee (SLSC-formed in 2014) which provides faculty and student input and oversight of many of the functions related to the office. There is a separate Student Life Advisory Committee, which is comprised of students from all levels and serves as an advisory group to the associate dean of student life and the SLSC. The OSL Deans routinely attend Medical Student Council to provide the students with important updates as well as address student concerns. In addition, the OSL Deans actively participate in ASAL, the campus-wide committee for student affairs issues for all campus professional schools.

Financial aid and scholarships are also managed and/or tracked by OSL. Thanks to the efforts of Financial Aid Officer Deedee Colussy, along with expanded scholarship efforts led by Dean Zimmer, our DFA, Cindy Allen, and the Office of Advancement, we have been able to reduce student debt to the national average.

For more information visit our website at: <https://medschool.cuanschutz.edu/education/current-students>

Scholarship Committees

- During the 2020-2021 academic year, the office continued to manage the SOM Scholarship Committees, the Adler Scholarship Committee, as well as the ARCS scholarship process and several other scholarships. We are transitioning leadership of tracking to a newly hired financial professional who will work closely with Student Affairs and Admissions. In this year, the School of Medicine provided scholarships to over 192 medical students, 43 of whom were entering students and 149 continuing. The total amount of scholarship money awarded was \$4,808,192
- The Dean's Distinguished Medical Scholarship program, a four-year half- and full-tuition recruitment scholarship, was awarded to 20 incoming medical students who matriculated in 2021 as members of the class of 2025. Named Dean's Distinguished scholarships included the following: Blackwood, Lopez, McGlone, Laurie Odom, Mile High Medical Society, Barbara Smith Reilly, Nancy Nelson, Cogen Family, and CU School of Medicine Classes of 1969, 1982, and 1987.
- Ten seniors from the class of 2020 received a total of \$20,000 in Adler MSA Scholarship in recognition of excellence for their completed MSA projects.
- Ten students received ARCS Scholarships based on research excellence for \$6,500 each, totaling \$65,000.

For more information visit our website at: <https://medschool.cuanschutz.edu/education/md-admissions/requirements/financial-aid-costs>

Student Affairs

The Student Affairs group is headed by Brian Dwinell, MD, who serves as the associate dean for student life, having responsibility for both Admissions and Student Affairs. Jeff Druck, MD, begins his seventh year as assistant dean for student affairs, where he is joined by Amira del Pino-Jones, MD, who was appointed to the position last year. Due to del Pino-Jones's parental leave, Deborah Seymour, PsyD, was appointed as interim assistant dean for student affairs, where she managed this new role in addition to her usual duties as the director of academic support services, and her roles related to communication skills in FDC (Foundations of Doctoring Curriculum) and Trek curricula. Haylee Shacklock serves as the director of OSL and OME.

Druck also serves as co-director of the Office of Professional Excellence, which allows for synergy in our efforts to improve the learning environment, particularly as it relates to wellness and unprofessional behavior by faculty and residents toward medical students. We monitor our mistreatment index on the AAMC Graduation Questionnaire, and this past year was our best performance since this has been measured. We will continue to work with Druck and OPE to improve our educational environment.

With the changes due to COVID, the Student Affairs arm of the Office of Student Life was busy, responding to new needs, rapidly adapting to the unfamiliar educational environment, and supporting students. Dwinell, Druck, del Pino-Jones and Seymour made themselves available to students constantly, and the office created a new system to ensure support for students: the advisory family system, which created groups of eight students total, two from each year, led by fourth-year students, who provided weekly Zoom check-ins and twice weekly text communications. With a significant amount of confusion around Step 1 and Step 2 scheduling, virtual interviews, and a different residency match process, Student Affairs scrambled to keep students informed, sending out emails as soon as information was available, and scheduling a weekly office hours, which were attended on average by 30 students. In addition, they developed a weekly newsletter, which will be continued beyond the pandemic. With COVID restriction limiting in-person exposure, even for clinical rotations, Student Affairs incorporated over 20 changes made to the policies and procedures manual and assure student success.

New advice around best practices for applications and interviews for the Match season were incorporated, with the new system of interview tracking implemented, allowing for improved attention to at-risk students in the Match process. This additional oversight led to a relatively stable Match season despite the increased uncertainty caused by the pandemic.

The Office of Student Life (OSL) is responsible for the oversight of most student support services including academic, career, and personal advising, financial aid, residency applications, support and referrals for struggling students, and USMLE Step Exam preparation. Our new remediation team with Deb Seymour, PsyD, as director of academic success, and Nida Awadallah, MD, as the director of clinical remediation, continues to have a measurable impact. We have seen a reduction in the Step 1 failure rate despite the added stress on our students of the pandemic and resulting disruption of testing access. We continue to discuss expanding our remediation efforts, including a more proactive approach to identifying and providing early intervention for struggling learners. OSL is also responsible for the coordination of major student activities including the Advisory College program, student interest groups, orientation, the Match process, Match Day, graduation, visiting externs, student scheduling, and the Student Promotions Committee. Nearly all our large events were converted to virtual events due to the pandemic, however we were able to hold a live graduation, which was extremely well received. A back-to-campus movie night primarily for the Class of 2024 was also a tremendous success.

As the Trek Curriculum will be beginning in the new academic year, OSL has prepared to adapt to new and differing student needs. The Advisory College Program, which has been in existence for approaching a decade, will morph into the new advisory structure, termed COMPASS guides, which comprises 19 faculty funded at 0.2 FTE for the first year, and transitioning to 0.3 FTE per guide for year 2. Next year, an additional cohort of 18 guides will be hired, with a similar FTE plan. The responsibility of these guides will have three main pillars:

- Coaching, with faculty development as a focus;
- Teaching, with these guides responsible for educating on Health and Society topics; and
- Assessment, with the guides responsible for giving feedback and serving in a grading capacity for students they do not coach.

This expansion was specifically undertaken to address a greater need for individual student support as it relates to academic success and the stressors of medical school. Our assessment team has worked with us in creating a Dashfolio that provides valuable performance information for each student, and the Student Affairs group was able to transition from an outdated database to a revamped, streamlined web-based student tracking system named Yoda.

Three years ago, the University approved the creation of a Master's in Medical Science, a project spearheaded by Jeff Druck, MD. This degree is for students who complete the first two years of medical school but do not to continue in the MD program. This degree recognizes the significant amount of effort and discrete knowledge our students obtain during these two years and may assist in obtaining employment in a variety of fields going forward. We plan to begin an effort to catalogue career paths taken by our Master's degree recipients.

Areas of responsibilities and service include

- Working with students having academic or personal struggles, and connecting them with our learning resource experts and/or making appropriate referrals;
- Career advising and creation of the Medical Student Performance Evaluation (MSPE);
- Overseeing major events, including Orientation, Match Day, and Graduation;
- Overseeing USMLE Step 1 and preparation;
- Providing programming and support for students in the areas of personal and professional development, career exploration and planning, stress and burnout, student wellness, study/time management skills, and preparation for the Match;
- Providing programming and support for Advisory Colleges, and other faculty who are mentoring or advising students;
- Providing a part-time learning specialist to assist students with academic preparation;
- Working with specialists in the financial aid office to support student debt management;
- Working with donors and departments to provide and administer scholarships and awards;
- Scheduling Phase III and Phase IV students; confirming grades for all four phases;
- Manage the visiting student (extern) process, both from the home school and the host school;
- Tracking student data including grades, evaluations, absences, clinical requirements;
- Advocating for students by sitting on the various curriculum committees at the School of Medicine;
- Overseeing and providing support for Medical Student Council, OSR, student interest groups, AOA, and GHHS;
- Working with the Student Promotions Committee for successful transitions and remediation, and when necessary, working with the struggling students to facilitate the decisions of the Student Promotions Committee;
- Interfacing with national organizations as it relates to medical student experiences (e.g. AAMC, NBME, etc.);
- Coordinating with legal counsel regarding policy and individual student issues; and
- Communicating with CPHP regarding students referred for additional support.

On March 19, 2021, Match Day was held virtually. 185 students matched into residency positions. The table below shows a full list of specialty matches where 41% matched in Primary Care specialties (Family Medicine, Internal Medicine, Medicine – Primary track, Med-Peds and Pediatrics).

Some of these students may ultimately choose to specialize in a non-primary care field. The top residency choices included Internal Medicine (28 categorical matches), Emergency Medicine (16 matches), and Family Medicine (30 matches), Pediatrics (15 matches), Anesthesiology (13 matches), Obstetrics-Gynecology (9) and Medicine-preliminary, Transitional Year, Surgery Prelim (combined 10 matches.)

Colorado will retain 38.4% of the class. California will receive 12% of the class, Texas and New York will each receive 6% of the class, Washington will receive 4.8%, and Missouri, North Carolina, Ohio, and Oregon will each receive 2.7% of the class. The remaining 22% of the class will be spread throughout 25 other states.

2021 Residency Match Data	
Number of Students	Specialty Choice
13	Anesthesiology
3	Dermatology
16	Emergency Medicine
30	Family Medicine
28	Internal Medicine
3	Med-Peds
7	Neurology & Child Neuro
1	Neurosurgery
9	Obstetrics/Gynecology
1	Ophthalmology
10	Orthopedics
1	Otolaryngology
1	Pathology
15	Pediatrics
4	Phys Medicine & Rehab
15	Psychiatry
5	Radiology, Diagnostic
6	Surgery-Categorical/Prelim
2	Urology
170	

On May 28, 2021, 175 students graduated with MD degrees.

For more information visit our website at: <https://medschool.cuanschutz.edu/education/current-students>

Admissions

The Office of Admissions continues to be led by Jeffrey SooHoo, MD, MBA, assistant dean of admissions. In his first year in this role, SooHoo and his team pivoted to an entirely virtual interview process while managing a 35% increase in the number of applications to CU School of Medicine. The School of Medicine received 14,106 primary applications for 184 seats in the class of 2025. Of these 184 entering students, 10 students entered the MD/PhD Program, 20 will participate in the Colorado Springs Branch Campus Longitudinal Integrated Clerkship and 12 will enter the new CU/CSU branch campus in Fort Collins. Additionally, the Office of Admissions recruited and interviewed applicants for multiple pipeline programs, accepting students into the University of Colorado Denver BA/BS-MD Program and the University of Colorado Denver Post-Baccalaureate Program.

The Office of Admissions continues to employ a holistic admission process. Grades and MCAT scores are significant variables in deciding who is invited for interviews, but greater emphasis is placed on the total application which includes letters of recommendation, both the primary and supplemental essays, and the applicant’s experiences and attributes.

Demographics

Class of	2023	2024	2025	Applicant Data 2020-2021 Primary AMCAS Applications: 14,106 Completed Secondary Applications: 8,549 Interviewed: 744 Offers of Admission: 348
Class Size	184	160	184	
Female	104	90	101	
Male	79	70	83	
CO Resident	90	71	86	
Non-Resident	94	89	98	
URiM*	50	32	46	
Average Age	25	25	25	
Cumulative GPA	3.73	3.75	3.76	
Math/Science GPA	3.67	3.68	515	
MCAT (total)	512	512	512	
*Under-represented in Medicine as defined by CUSOM Diversity Plan				

Annual achievements include:

- ◇ A record number of applications, including a substantial increase in first-generation students.
- ◇ Expanded partnership with the Office of Advancement and Scholarship Committee, with a record number of Dean’s Distinguished Scholarships distributed to incoming students.

The office continues to seek faculty for committee membership. If interested, please contact the Office of Admissions at SOMAdmin@ucdenver.edu.

For additional detailed information: <https://medschool.cuanschutz.edu/education/md-admissions>

Senior Program Leadership

Jeffrey R. SooHoo, MD, MBA
Assistant Dean of Admissions

Brian Dwinnell, MD
Associate Dean for Student Life

Faculty Affairs



The photo above is courtesy of @cuanschutz Instagram, July 27, 2021: "I became a doctor because I thought it would be an interesting way to combine a love of science, physiology and biology with human interaction but I was wrong. It has turned out to be the honor of a lifetime to have people trust you with their lives and use whatever skill, knowledge and experience I have to change the course of their lives no matter how small or big." – Richard Zane, MD, Chair and Professor, Department of Emergency Medicine, UHealth Chief Innovation Officer

Office of Faculty Affairs

Mission: The mission of the Office of Faculty Affairs is to provide services and support to faculty members, departments and programs, in order to advance the teaching, research, patient care and service missions of the School of Medicine.

Specific Objectives: The Office of Faculty Affairs will work collaboratively with School of Medicine, campus and university leaders to promote faculty and organizational success. Specifically, the Office of Faculty Affairs will:

- Assist departments and divisions to recruit, develop, promote and retain outstanding teachers, clinicians and scholars;
- Assist faculty, department chairs, and administrators to understand and comply with the rules of the university and the School of Medicine;
- Develop and implement policies and practices that promote diversity, equity, and inclusiveness, professionalism, collaboration, and academic integrity across the School of Medicine;
- Develop and implement policies and practices that ensure fair and consistent treatment of faculty, according to the rules of the university and the School of Medicine;
- Develop and implement policies and practices to build and sustain faculty vitality and success, through faculty development, mentorship, coaching, leadership training and resiliency;
- Develop and maintain a comprehensive faculty evaluation and post-tenure review system that uses valid and relevant measures of faculty performance, ensures faculty accountability, is linked to faculty self-improvement, provides reliable data for promotion and tenure decisions and reflects the missions and values of the School of Medicine;
- Assist faculty members to participate effectively in the shared governance of the School of Medicine;
- Conduct periodic faculty surveys to measure faculty satisfaction, vitality, and career success, and develop and implement policies to address challenges and guide change; and
- Provide administrative support for faculty appointments, promotions, tenure awards, post-tenure and annual performance reviews, and other activities.

Office of Faculty Affairs Leadership:

Steven R. Lowenstein, MD, MPH, Associate Dean for Faculty Affairs

Heather Cassidy, MD, FACP, Assistant Dean for Community Based Medical Education

Cheryl Welch, MPA, Director, Office of Faculty Affairs

Website: medschool.cuanschutz.edu/faculty-affairs/



The photo above is courtesy of @cumedschool Instagram, July 23, 2021: "CU School of Medicine hosted the #Classof2025 at @cuanschutz today for Orientation. Festivities of the day include, breakfast with COMPASS Navigators, Ted Talks, Trek curriculum overview, lunch with faculty members, round robin breakout sessions, and campus tours. Welcome to our incoming class of future medical professionals!"

Website: <http://medschool.ucdenver.edu/faculty>

Full-Time (\geq 50% FTE) Faculty, Listed by Department (Instructor and Above) July 1, 2021			
	University Paid	Affiliate Paid	Total
Total Full-Time Faculty Count	4,047	945	4,992
Basic Science Departments			
Biochemistry and Molecular Genetics	48	1	49
Cell and Developmental Biology	27	1	28
Immunology and Microbiology	39	14	53
Pathology	95	21	116
Pharmacology	30	0	30
Physiology and Biophysics	17	0	17
Subtotal	256	37	293
Clinical Science Departments			
Anesthesiology	308	28	336
Dermatology	33	5	38
Emergency Medicine	124	39	163
Family Medicine	152	78	230
Medicine	799	376	1,175
Neurology	93	15	108
Neurosurgery	65	5	70
Ob/Gyn	130	21	151
Ophthalmology	52	5	57
Orthopedics	154	18	172
Otolaryngology	68	7	75
Pediatrics	1,040	74	1,114
Physical Medicine and Rehabilitation	76	29	105
Psychiatry	285	136	421
Radiation Oncology	26	0	26
Radiology	115	39	154
Surgery	271	33	304
Subtotal	3,791	908	4,699

Full-Time (\geq50% FTE) Faculty, Listed by Rank			
(Instructor and Above)			
July 1, 2021			
	University Paid Faculty	Affiliate Paid Faculty	Total
Instructor	1,689	244	1,933
Assistant Professor	977	328	1,305
Associate Professor	788	226	1,014
Professor	593	147	740
Total Full-Time Faculty Count	4,047	945	4,992

Clinical Faculty	
July 1, 2021	
Volunteer	2,876
Paid (<.50 FTE)	422
Total Clinical Faculty Count	3,298



The photo above is courtesy of [@cuanschutz Instagram](#), September 30, 2021.





Medical Scientist Training Program

The photo above is courtesy of [@cuanschultz Instagram](#), October 11, 2020: “We are proud to welcome people of all backgrounds and identities to work, study, teach, research and make breakthroughs on our campus.”

“Happy [#NationalComingOutDay](#) to everyone who is out or in the process of coming out! We see you and we appreciate you!”

Medical Scientist Training Program

The Medical Scientist Training Program is a multidisciplinary, inter-institutional MD/PhD dual degree training program, educating students in clinical medicine and biomedical research. Its mission is to provide students with the breadth and depth of training necessary to excel as a physician-scientist. Post-baccalaureate students are recruited from a national pool of ~600 applicants, and those selected have proven exceptional talents in research science, a curiosity to solve mechanisms of disease, a drive for discovery, a well-thought-out motivation to pursue a career in medicine, and exceptional leadership.

The program was formed in 1983, and in 1992 it received MSTP status when it was awarded NIH T32 funding (currently ~\$1M/year to support 19 trainees per year). The program has strong leaders and mentors. MSTP is led by Cara Wilson, MD, who is an established physician-scientist with a consistent record of NIH research funding as well as extensive experience in mentoring and career development of trainees. Patricia Ernst, PhD, serves as the pre-clinical associate director and provides individualized guidance to each student via regular meetings and interactions prior to and during their thesis years. Drs. Joe Hurt and Matt Taylor, serve as clinical associate directors providing individualize guidance to students as they transition back to medical school for their clinical training and through their residency applications. The program continues to be reviewed and funded by the NIH each year.

The MSTP is an intercampus student training program, with over 200 faculty mentors in 17 PhD Programs at the Anschutz Medical Campus, National Jewish, and CU Boulder that can serve as PhD mentors. There are currently 87 students in the program: 10 in the first year (MS-I), 11 in the second year (MS-II), 46 in the PhD research years, and 20 in the Medical School Clinical years (MS-III and MS-IV). Since 1983, 264 students have matriculated in the MSTP, with 148 having graduated with both degrees in 8.2 years. Graduates of the MSTP obtain residencies at the nation's elite programs and about 75 percent of those completing training are now employed in academic medicine, government (NIH or CDC), or industry, including starting up their own biotech companies.

Importantly, we have an increasing number of MSTP graduates (16) who are now faculty at the University of Colorado Anschutz Medical Campus and another 14 who are completing their residency and/or fellowship training here. The Colorado MSTP and its leaders have been key in establishing the National Association of MD/PhD Directors and Administrators, the MD/PhD Section of the Association of American Medical Colleges Graduate Research, Education, and Training Group (GREAT), and the Annual National MD/PhD Student Conference. Finally, we have taken the initiative to bring together, via social and academic venues, all MD/PhDs on the Anschutz Medical Campus, across all stages of training, from student to faculty status, to establish an interactive, supportive cadre of physician-scientists.

Additional details of the Medical Scientist Training Program can be found at <https://medschool.cuanschutz.edu/mstp>



The photo above is courtesy of @cuanschultz Instagram, October 2, 2020.



The photo above is courtesy of [@cuanschultz](#) Instagram, September 9, 2020. Photo cred: [@niki_russell](#).

Research



Research Advisory Committee

The Research Advisory Committee (RAC) was established by the Research Strategic Plan of 2003 to advise the Dean of the School of Medicine on matters related to research, and it now also advises the Vice Chancellor for Research. The committee meets monthly. RAC deliberations over this past year included a comprehensive review of the current list of core facilities on campus. The RAC updated the core list and created a proposed definition of a core facility in order to help keep this list current. A recommendation regarding core support was provided to the Dean. The RAC also conducted a campus-wide survey to collect projected animal space needs in order to help with space development plans in the coming years. A recommendation to reevaluate the master plan for campus development to address the expanding animal space needs was provided to the Dean.

<https://medschool.cuanschutz.edu/research/research-development/research-advisory-committee>

Research Advisory Committee (RAC)	
Mary Weiser-Evans, PhD – Committee Chair	Edward Janoff, MD
Steve Abman, MD	Jeff Kieft, PhD
Peter Buttrick, MD	Doug Novins, MD
James Costello, PhD	Roberta Pelanda, PhD
Thomas Flaig, MD	Suzann Ruedeman
Casey Greene, PhD	Jill Slansky, PhD
Eva Nozik, MD	Fred Suchy, MD
	Lori Sussel, PhD

Bridge Funding

The bridge funding program of the CU School of Medicine was established in 2006 to provide support to principal investigators while they re-apply for funding. The Bridge Funding Committee is advisory to the Dean. Applications are reviewed in April and November. Between 2006 and April 2021, 233 awards have been made to 194 faculty members in a total amount of \$11.4 million. From the start through April 2016, 136 of these awardees, who received \$8.18 million in bridging awards, have gained \$111.0 million in total research dollars, a more than 13.5-fold return on investment on bridge-funding grants.

<https://medschool.cuanschutz.edu/research/research-development/bridge-funding>

Bridge Funding Committee
Raphael Nemenoff, PhD – Committee Chair
John Cambier, PhD, MS
Mair Churchill, PhD
Nancy Hadley-Miller, MD
Wendy Kohrt, PhD
Ed Melanson, PhD
Kurt Stenmark, MD
Peter Buttrick, MD

Strategic Infrastructure for Research Committee

The Strategic Infrastructure for Research Committee (SIRC), created in 2003, reviews proposals to fund research infrastructure that can be available as a core facility or program to all appropriate users on campus. One of the major benefits of the SIRC process is critical peer review and the return of constructive comments that have strengthened the quality and productivity of the School of Medicine's research and have improved the cost-effectiveness of the Dean's Academic Enrichment Fund (AEF). Applications for ongoing cores must include a plan for sustainability. This committee is advisory to the Dean.

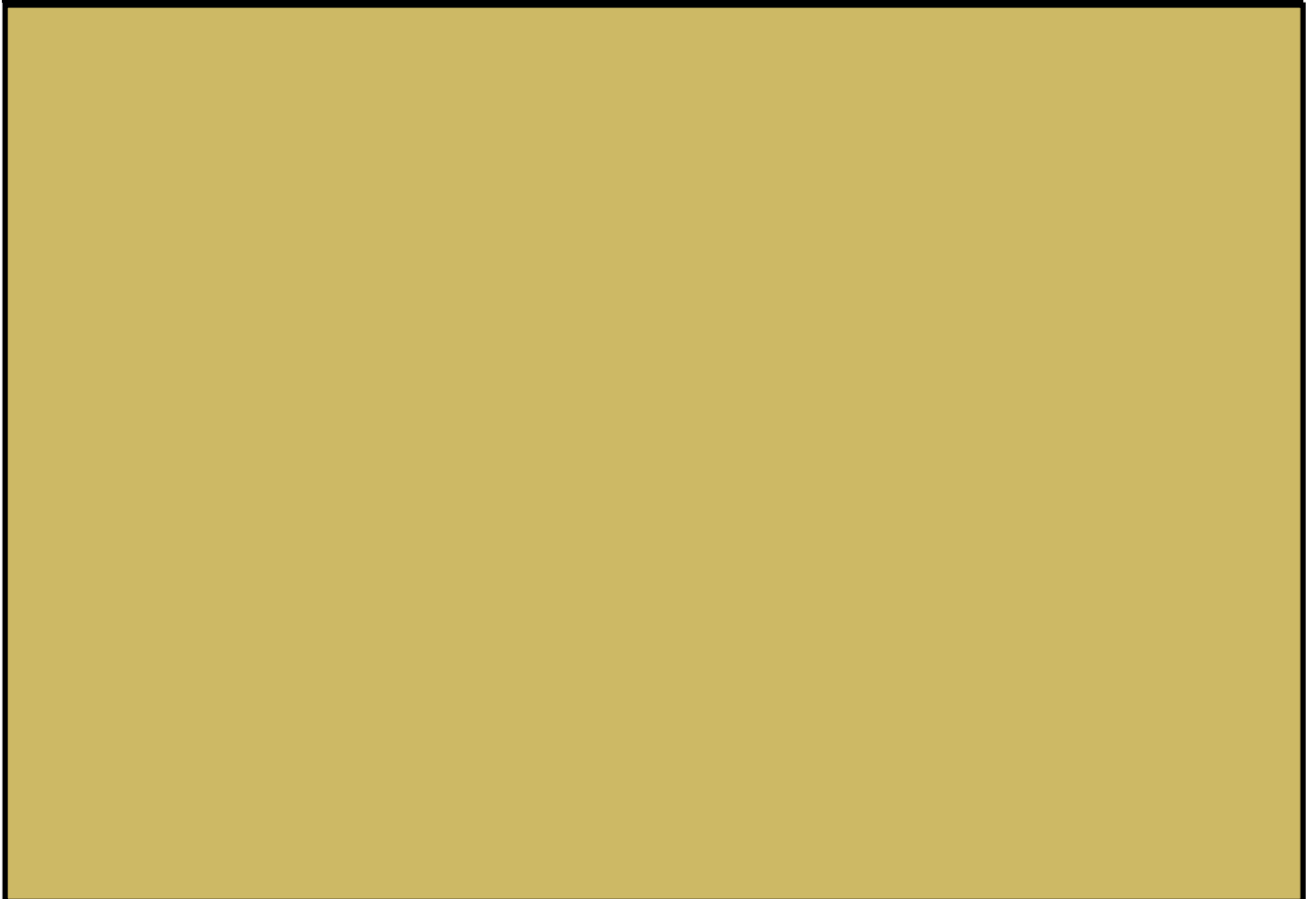
SIRC applications are solicited quarterly. Through the August 2021 review the SIRC process has made 106 awards totaling \$18.2 million in Dean's funds. Six additional 2-to-5-year awards, totaling \$7.3 million, were made to projects identified at a 2009 research retreat.

SIRC-approved research infrastructure includes:

- Core facilities in high-throughput genomics and metabolomics, biomedical informatics, advanced light microscopy, tissue banking, small-animal imaging, mouse behavior, and the Clinical-Translational Research Imaging Core.
- Core programs granting an MS or PhD in medical science for medical & graduate students and faculty, year-long mentorship in outcomes research, biostatistics support, patient databases in pregnancy and developmental disabilities, and a biorepository.

<https://medschool.cuanschutz.edu/research/research-development/strategic-infrastructure-for-research-committee>

Strategic Infrastructure for Research Committee (SIRC)	
Lori Sussel, PhD – Chair Lisa Brenner, PhD Andrew Fontenot, MD Chris Gignoux, PhD Sue Kinnamon, PhD	Laurel Lenz, PhD J. Mark Petrash, PhD Rebecca Schweppe, PhD Peter Buttrick, MD



New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Steven Abman, MD, Professor	<i>Role of VEGF in Perinatal Hypertension</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Cheryl Ackert-Bicknell, PhD, Associate Professor	<i>Identification of Gene Regulating PTH-mediated Skeletal Strength</i>	National Institute of Arthritis & Musculoskeletal and Skin Diseases/NIH/DHHS
Jill Alldredge, MD, Assistant Professor	<i>A18-00 Randomized, Ph 3, Double-Blind Study of Chemoradiotherapy With or Without Pembrolizumab for the Treatment of High-risk, Locally Advanced Cervical Cancer</i>	Merck Sharp & Dohme Corp
Mandy Allison, MD, Associate Professor	<i>NSO-PRC Projects 2020-2024</i>	Nurse-Family Partnership National Service Office
Cem Mustafa Altunbas, PhD, Associate Professor	<i>Improving quantitative accuracy and tissue visualization in CBCT guided radiation therapy</i>	National Cancer Institute/NIH/DHHS
Enrique Alvarez, III, MD, PhD, Associate Professor	<i>A single-arm, prospective, multi-centre, open-label study to evaluate ofatumumab treatment effectiveness and patient reported outcomes in patients with relapsing multiple sclerosis transitioning from dimethyl fumarate or fingolimod therapy</i>	Novartis Pharmaceuticals Corporation
Enrique Alvarez, III, MD, PhD, Associate Professor	<i>A Phase 1, Two-part, Open-label Dose-escalation and Double-blind, Placebo-controlled Dose-expansion Study with an Open-label Extension to Evaluate the Safety and Efficacy of ATA188 in Subjects with Progressive Multiple Sclerosis</i>	Atara Biotherapeutics, Inc
Enrique Alvarez, III, MD, PhD, Associate Professor	<i>A PHASE IIIB multicenter, randomized, double-blind, controlled study to evaluate the efficacy, safety and pharmacokinetics of a higher dose of Ocrelizumab in adults with primary progressive multiple sclerosis</i>	Genentech, Inc.

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Enrique Alvarez, III, MD, PhD, Associate Professor	<i>A PHASE III multicenter, randomized, double—blind, double-dummy, parallel-group study to evaluate the efficacy and safety of Fenebrutinib compared with Teriflunomide in adult patients with relapsing multiple sclerosis</i>	Genentech, Inc.
Maria Laura Amaya, MD, PhD, Instructor	<i>A phase 1/2 study of ALX148 in combination with Azacitidine in patients with higher risk myelodysplastic syndrome (MDS)</i>	ALX Oncology Inc.
Melinda Anderson, PhD, Assistant Professor	<i>The contributions of age related changes in the sound localization pathway to central hearing loss</i>	National Institute on Deafness and Other Communication Disorders/NIH/DHHS
Laura Anthony, PhD, Professor	<i>Implementation of a Robust Executive Function Intervention Delivered in Schools: Unstuck and On Target!</i>	Patient-Centered Outcomes Research Institute
Bruce Appel, PhD, Professor	<i>Mechanisms of Developmental Myelination</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS
Francisco Asturias, PhD, Associate Professor	<i>Ultra-potent HIV capsid inhibitors</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
David Badesch, MD, Professor	<i>COMIRB #21-2564: Protocol MK-5475-007: A Phase 2/3, Multicenter, Randomized, Double-blind, Placebo-Controlled, Adaptive Design Study to Evaluate the Efficacy and Safety of MK-5475 in adults with pulmonary arterial hypertension</i>	Merck Sharp & Dohme Corp
Anirban Banerjee, PhD, Professor	<i>Mechanisms of Trauma Induced Coagulopathy</i>	National Institute of General Medical Sciences/NIH/DHHS
Linda Barbour, MD, Professor	<i>Triglycerides as a Predictor of Newborn Subcutaneous and Liver Fat: Contributors to Fetal Fat Accretion in Obese Pregnancies</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Alexander Barker, PhD, Associate Professor	<i>Role of Valve-Mediated Hemodynamics on Bicuspid Aortopathy</i>	National Heart, Lung, and Blood Institute/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Linda Barlow, PhD, Professor	<i>Characterization of progenitor populations in adult taste epithelium</i>	National Institute on Deafness and Other Communication Disorders/NIH/DHHS
Kathleen Barnes, PhD, Professor	<i>Multi-omic studies of asthma severity in an African ancestry population</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Karl Ulrich Bayer, PhD, Professor	<i>Postsynaptic kinase/phosphatase networks in amyloid beta-induced synaptic dysfunction</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS
Timothy Benke, MD, PhD, Professor	<i>Multi-site validation of biomarkers and core clinical outcome measures for clinical trials readiness in CDKL5 Deficiency Disorder</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS
Leslie Berg, PhD, Professor	<i>Dissecting the pathways controlling tunable responses to TCR signaling</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Bryan Bergman, PhD, Professor	<i>Intermuscular adipose tissue (IMAT): protagonist in sarcopenia and insulin resistance in humans</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Audrey Bergouignan, PhD, Assistant Professor	<i>Breaking up sedentary behaviors to improve glucose control in a population at risk for developing type 2 diabetes</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Daniel Bessesen, MD, Professor	<i>Adaptive responses to overfeeding and weight regain in reduced obese individuals</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Brianne Bettcher, PhD, Associate Professor	<i>Investigating the Contribution of Peripheral versus Central Nervous System Immune Dysfunction to Cognitive Aging</i>	National Institute on Aging/NIH/DHHS
Marian Betz, MD, Professor	<i>Decision Making Among Older Adults: the AUTO study</i>	National Institute on Aging/NIH/DHHS
Marian Betz, MD, Professor	<i>Online Storage Maps to Facilitate Voluntary Firearm Storage: Mixed Methods Evaluation</i>	National Institute of Mental Health/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Benjamin Bitler, PhD, Assistant Professor	<i>Investigating Combinatorial Approaches to Enhance cGAS/STING Activation and Anti-Tumor Immunity</i>	Department of the Army
Joshua Black, PhD, Assistant Professor	<i>Defining the Role of DNA Rereplication of Chromosome 21 in the Development and Pathophysiology of Down Syndrome</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Virginia Borges, MD, Professor	<i>Paul Calabresi Award in Clinical Oncology Research</i>	National Cancer Institute/NIH/DHHS
Cathy Bradley, PhD, MPA, Professor	<i>Cancer Caregivers and Their Struggle(s) between Work and Family</i>	National Cancer Institute/NIH/DHHS
Todd Bull, MD, Professor	<i>PREVENT-HD: A multicenter, randomized, placebo-controlled, pragmatic Phase 3 study investigating the efficacy and safety of rivaroxaban to reduce the risk of major venous and arterial thrombotic events, hospitalization and death in medically ill outpatients with acute symptomatic COVID-19 infection</i>	Janssen Research & Development LLC
Ellen Burnham, MD, Professor	<i>I-SPY COVID-19 Trial</i>	Quantum Leap Health Care Collaborative
Ellen Burnham, MD, Professor	<i>A Phase 2 Study of BIO 300 Oral Suspension in Discharged COVID-19 Patients</i>	Humanetics Corporation
Ellen Burnham, MD, Professor	<i>CoPARC: Colorado Pulmonary Alcohol Research Collaborative</i>	National Institute on Alcohol Abuse and Alcoholism/NIH/DHHS
Maria Cecilia Caino, PhD, Assistant Professor	<i>Understanding the MIRO2/GCN1 signaling axis for therapeutic gain in lethal prostate cancer</i>	Department of the Army
John Caldwell, PhD, Professor	<i>Optimization of a Minimally-Invasive Bidirectional Optogenetic Peripheral Nerve Interface with Single Axon Read-in & Read-out Specificity</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Thomas Campbell, MD, Professor	<i>AIDS Clinical Trials Group Network (UCLA funding)</i>	University of California, Los Angeles
Valeria Canto-Soler, PhD, Associate Professor	<i>3D retinal transplants derived from human induced pluripotent stem cells to treat combat laser-induced blindness</i>	Us Army Medical Research Acquisition Act
David Edward Case, MD, Assistant Professor	<i>EndoVascular treatment for Acutely ruptured shallow intradural aneurysms Not amenable To clipping And/or coilinG with the Pipeline™ Vantage Embolization device (VANTAGE)</i>	Medtronic Incorporated
Katherine Casillas, PhD, Assistant Professor	<i>SafeCare® Colorado Program Intermediary Services</i>	Colorado Department of Human Services
Jose Ramon Castillo-Mancilla, MD, Associate Professor	<i>New Pharmacologic Measures of ART Adherence and Exposure: Pathway to Clinical Implementation</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Victoria Catenacci, MD, Associate Professor	<i>Comparison of Weight Loss Induced by Intermittent Fasting Versus Daily Caloric Restriction in Individuals with Obesity: A 1-Year Randomized Trial</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Kathryn Chatfield, MD, PhD, Associate Professor	<i>Oxidization of Cardiolipin and its Role in Mitochondrial Dynamics in Pediatric Dilated Cardiomyopathy</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Antonia Elisabetta Chiesa, MD, Associate Professor	<i>CARENnetwork (Child Abuse Response and Evaluation Network)</i>	Colorado Department of Public Health and Environment/COLO
Susan Childress, MD, Associate Professor	<i>A Phase 2 Dose Ranging Study to Evaluate the Efficacy and Safety of AMG 570 in Subjects With Active Systemic Lupus Erythematosus (SLE) With Inadequate Response to Standard of Care (SOC) Therapy</i>	Amgen, Inc.
Jason Christie, PhD, Visiting Associate Professor	<i>Organization of inhibition in the cerebellar cortex</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Eric Clambey, PhD, Assistant Professor	<i>Therapeutic targets in gammaherpesvirus infection</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
David Clouthier, PhD, Associate Professor	<i>Genes and Transcripts that Interact with MUC5B in Pulmonary Fibrosis</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Rebecca Cohen, MD, Assistant Professor	<i>A Phase 3, Open-label, Multi-center, Single Arm Study to Assess Contraceptive Efficacy and Safety of the Etonogestrel (MK-8415) Implant During Extended Use From 3 Years After Insertion in Females 35 Years of Age or Younger</i>	Merck Sharp & Dohme Corp
Randall Cohrs, PhD, Professor	<i>Role of VZV latency transcript (VLT) and ORF63 in latency and reactivation</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
John Corboy, MD, MA, Professor	<i>DISCOMS Extension</i>	Emd Serono, Inc.
Bradley Corr, MD, Assistant Professor	<i>MK-7902-001 Ph 3 Randomized, Open-Label, Study of Pembrolizumab (MK-3475) Plus Lenvatinib (E7080/MK-7902) Versus Chemotherapy for First-line Treatment of Advanced or Recurrent Endometrial Carcinoma (LEAP-001)</i>	Merck, Sharp and Dohme Corp
James Costello, PhD, Associate Professor	<i>Systems analysis of aggressive prostate cancer pathology</i>	National Cancer Institute/NIH/DHHS
Scott Cramer, PhD, Professor	<i>Systems analysis of aggressive prostate cancer pathology</i>	National Cancer Institute/NIH/DHHS
Dana Dabelea, MD, PhD, Professor	<i>Influence of Prenatal and Early Childhood Home-Visiting by Nurses on Development of Chronic Disease: 29-year Follow-Up of a Randomized Clinical Trial</i>	National Heart, Lung, and Blood Institute/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Dana Dabelea, MD, PhD, Professor	<i>The Early Life Exposome and Childhood Health - The Colorado Healthy Start 3 Cohort Study</i>	Office of the Director, National Institutes of Health/NIH/DHHS
Angelo D'Alessandro, PhD, Assistant Professor	<i>PIMT1 in Red Blood Cell aging in vivo and in vitro</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Angelo D'Alessandro, PhD, Assistant Professor	<i>Interactions between the ADORA2b/Sphk1axis and the AE1-Hb switch in red blood cell aging in vivo and in vitro</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Stephen R. Daniels, MD, PhD, Professor	<i>Influence of Prenatal and Early Childhood Home-Visiting by Nurses on Development of Chronic Disease: 29-year Follow-Up of a Randomized Clinical Trial</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Jesse Davidson, MD, MPH/MSPH, Associate Professor	<i>Metabolic profiling and comprehensive metabolic pathway mapping: a systems biology approach to cardiovascular failure and organ injury following infant congenital heart disease surgery</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Kevin Deane, MD, Professor	<i>Collaborative Research Agreement- Understand the natural history of Rheumatoid Arthritis (RA) development from the period of preclinical disease to classifiable disease</i>	University of California at San Diego
James DiGregori, PhD, Professor	<i>Down Syndrome as a systemic autophagy deficiency disorder</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Mark Dell'Acqua, PhD, Professor	<i>L-type Ca²⁺ Channel Spike Regulation of Spine Structural Plasticity and Excitation-Transcription Coupling</i>	National Institute of Mental Health/NIH/DHHS
Mark Dell'Acqua, PhD, Professor	<i>Postsynaptic kinase/ phosphatase networks in amyloid beta-induced synaptic dysfunction</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Mary Demoruelle, MD, PhD, Associate Professor	<i>Neutrophil Extracellular Traps in the Lung and Development of Rheumatoid Arthritis-Related Autoimmunity and Arthritis</i>	National Institute of Arthritis & Musculoskeletal and Skin Diseases/NIH/DHHS
Daniel Denman, PhD, Assistant Professor	<i>Interrogating the propagation of electrical stimulation across scales in vivo</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS
Edwin deZoeten, MD, PhD, Associate Professor	<i>Defining a Novel Therapeutic Application of Lactoferrin for Intestinal Inflammation</i>	Department of the Army
Jennifer Diamond, MD, Associate Professor	<i>CA048-001-0009 Ph 1 Multi-Targeted Study to Promote Anti-Tumor Immunity in ER Positive, HER2 Negative Advanced Breast Cancer</i>	Bristol Myers Squibb Pharmaceutical
Jennifer Diamond, MD, Associate Professor	<i>AL42478 expanded access, single arm, multicenter study to provide at home subcutaneous administration of pertuzumab and trastuzumab fixed-dose combination (PH FDC SC) for patients with HER2-positive breast cancer during the COVID-19 pandemic</i>	Genentech, Inc.
W. Perry Dickinson, MD, Professor	<i>Facilitating Alcohol Screening and Treatment (FAST), Colorado</i>	Agency for Healthcare Research and Quality/DHHS
Stacy Elaine Dixon, MD, PhD, Assistant Professor	<i>A Phase 3b, Multicenter, Randomized, Double-Blind Study to Evaluate Efficacy and Safety of Oral Edaravone Administered for a Period of 48 Weeks in Subjects with Amyotrophic Lateral Sclerosis (ALS)</i>	Mitsubishi Tanabe Pharma Development America, Inc
Kelly Doran, PhD, Professor	<i>Host and bacterial mechanisms governing Group B streptococcal persistence in the female genital tract</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Cory Dunnick, MD, Professor	<i>JAK Inhibition in Down Syndrome</i>	National Institute of Arthritis & Musculoskeletal and Skin Diseases/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Benjamin Easter, MD, Assistant Professor	<i>IPA Agreement - Benjamin Easter</i>	Johnson Space Center/NASA
Anthony Elias, MD, Professor	<i>NCI National Clinical Trials Network - Lead Academic Participant Sites</i>	National Cancer Institute/NIH/DHHS
Kristine Erlandson, MD, Associate Professor	<i>The High-Intensity Exercise to Attenuate Limitations and Train Habits (HEALTH) in Older Adults with HIV</i>	National Institute on Aging/NIH/DHHS
Kristine Erlandson, MD, Associate Professor	<i>Pitavastatin to Reduce Physical Function Impairment and FRailty in HIV (PREPARE)</i>	National Institute on Aging/NIH/DHHS
Joaquin Espinosa, PhD, Professor	<i>Data Management and Portal for the INCLUDE (DAPI) Project</i>	Children's Hospital of Philadelphia
Joaquin Espinosa, PhD, Professor	<i>JAK Inhibition in Down Syndrome</i>	National Institute of Arthritis & Musculoskeletal and Skin Diseases/NIH/DHHS
Joaquin Espinosa, PhD, Professor	<i>Understanding Down Syndrome as an Interferonopathy</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Christopher Evans, PhD, Professor	<i>Role of Mucin in Lung Homeostasis and Pathophysiology</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Sarah Faubel, MD, Professor	<i>Cardiac dysfunction after ischemic AKI in mice</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Ana Fernandez-Bustamante, MD, PhD, Associate Professor	<i>Predictive modeling including point-of care lung ultrasound (P-LUS) for emergency triage of patients with acute respiratory symptoms related to COVID-19</i>	ABSS Solutions, Inc. ("ASI")
Thomas Flaig, MD, Professor	<i>Optimizing High Dose Testosterone Therapy for the Treatment of Advanced Prostate Cancer</i>	Department of the Army

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Andrew Fontenot, MD, Professor	<i>T cell Epitope Discovery in Sarcoidosis</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Andrew Fontenot, MD, Professor	<i>Role of Chemokines in Innate and Adaptive Immunity in the Lung</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Andrew Fontenot, MD, Professor	<i>T cell Epitope Discovery in Sarcoidosis</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Heide Ford, PhD, Professor	<i>Deciphering Mechanisms by which Tumor Cells Collaborate to Mediate Metastasis</i>	National Cancer Institute/NIH/DHHS
Heide Ford, PhD, Professor	<i>Role of Eya3 in regulating the immune microenvironment to promote breast tumor progression</i>	National Cancer Institute/NIH/DHHS
Nicholas Foreman, MD, Professor	<i>Single-Cell RNAseq Directed Targeting of Therapy-Resistant Subpopulations that Drive Relapse in Childhood Ependymoma</i>	Us Army Medical Research Acquisition Act
Peter Forsberg, MD, Assistant Professor	<i>An open-label, multi-center Phase 1 trial evaluating the safety and pharmacokinetics of escalating doses of BFCR4350A in patients with relapsed or refractory multiple myeloma</i>	Genentech, Inc.
Daniel Frank, PhD, Associate Professor	<i>Defining a Novel Therapeutic Application of Lactoferrin for Intestinal Inflammation</i>	Department of the Army
Sandra Lee Friedman, MD MPH/MSPH, Professor	<i>JFK Partners UCEDD</i>	Administration for Community Living/DHHS
Sandra Lee Friedman, MD MPH/MSPH, Professor	<i>JFK Partners Colorado LEND Program</i>	Maternal and Child Health Bureau/HRSA/DHHS
Anastacia Marie Garcia, PhD, Assistant Professor	<i>Peripheral Mononuclear Cells as Biomarkers for Myocardial Metabolic Function in Single Ventricle Congenital Heart Disease Patients</i>	Additional Ventures

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Satish Garg, PhD, Professor	<i>Evaluation of the Safety and Effectiveness of the Dexcom Continuous Glucose Monitoring (CGM) System PTL-903880</i>	Dexcom, San Diego, CA
Andrea Gerard, MD, Associate Professor of Clinical Practice	<i>Dissemination of Group Clinic Model for Diabetes Care for Latino Patients</i>	Leona M. And Harry B. Helmsley Charitable Trust
Moumita Ghosh, PhD, Visiting Associate Professor	<i>Progenitor cell malfunction, mutations and changes in microenvironment: A dynamic risk spectrum for cancer evolution</i>	National Cancer Institute/NIH/DHHS
Emily Gibson, PhD, Associate Professor	<i>Optimization of a Minimally-Invasive Bidirectional Optogenetic Peripheral Nerve Interface with Single Axon Read-in & Read-out Specificity</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS
Christopher Gignoux, PhD, Associate Professor	<i>Genomic Approaches to Population Health in Multi-Ethnic Hospital Systems</i>	National Human Genome Research Institute/NIH/DHHS
Adit Ginde, MD, PhD, Professor	<i>TREAT NOW</i>	ABSS Solutions, Inc. ("ASI")
Russell Glasgow, PhD, Research Professor	<i>Implementation to Achieve Clinical Transformation (IMPACT): The Colorado Training Program</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Russell Glasgow, PhD, Research Professor	<i>Pragmatic implementation Science Approaches to Assess and Enhance Value of Cancer Prevention and Control in Rural Primary Care</i>	National Cancer Institute/NIH/DHHS
Michael Graner, PhD, Research Professor	<i>Development of Validation of Phage-Displayed Random Peptide Libraries Technologies for Rapid Isolation and Characterization of Extracellular Vesicles from Patients with Brain Tumors</i>	National Institute of Mental Health/NIH/DHHS
Melanie Cree Green, MD, PhD, Associate Professor	<i>Impact of GLP-1 on hepatic fat and energy utilization in obese girls with polycystic ovarian syndrome</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Casey Greene, PhD, Professor	<i>Characterization of high-grade serious ovarian cancer subtypes via single-cell profiling</i>	National Cancer Institute/NIH/DHHS
Nathaniel Greene, PhD, Assistant Professor	<i>Correlation of Electromechanical Hearing Protection Test Methods with Human Performance</i>	Applied Research Associates, Inc., Rocky Mountain Division
Arthur Gutierrez-Hartmann, MD, Professor	<i>Medical Scientist Training Program</i>	National Institute of General Medical Sciences/NIH/DHHS
Jonathan Gutman, MD, Associate Professor	<i>A Randomized, Open Label Phase 3 Study Evaluating Safety and Efficacy of Venetoclax in combination with Azacitidine after allogeneic Stem Cell Transplantation in Subjects with Acute Myeloid Leukemia (AML) (VIALE-T)</i>	AbbVie, Inc.
Masanori Hayashi, MD, Assistant Professor	<i>Identification of Drivers of Metastasis Initiating Cells in Ewing Sarcoma</i>	Department of the Army
Peter Henson, MD, PhD, Distinguished Professor	<i>Multi-Disciplinary Research Training in Respiratory Disease</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Teresa Hernandez, PhD, Visiting Clinical Professor	<i>Triglycerides as a Predictor of Newborn Subcutaneous and Liver Fat: Contributors to Fetal Fat Accretion in Obese Pregnancies</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Jay Hesselberth, PhD, Associate Professor	<i>Biochemistry at single-cell resolution: a new approach to understand functional heterogeneity</i>	National Institute on Aging/NIH/DHHS
Vernon Holers, MD, Professor	<i>Prevention Center U01: Early Targets for Antigen-Specific Tolerance Induction in Preclinical Rheumatoid Arthritis</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Vernon Holers, MD, Professor	<i>Evolving Adaptive and Effector Mechanisms from Pre-RA Through Established Disease</i>	National Institute of Arthritis & Musculoskeletal and Skin Diseases/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Fernando Holguin, MD, Professor	<i>SANDIA: Supplementing L-citrulline to overweight late Asthma onset phenotypes to increase airway L-arginine/ADMA ratio and Improve Asthma control</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Jodi Holtrop, PhD, Professor	<i>PATHWEIGH: pragmatic weight management in primary care</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Christian Hopfer, MD, Professor	<i>Impact of Marijuana Legalization: Comparison of Two Longitudinal Twin Cohorts</i>	National Institute on Drug Abuse/NIH/DHHS
Alexander Horswill, PhD, Professor	<i>Quorum sensing, diversity and skin inflammation</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Lawrence Hunter, PhD, Professor	<i>Knowledge-Based Biomedical Data Science</i>	National Library of Medicine/NIH/DHHS
Kent Hutchison, PhD, Visiting Professor	<i>Dismantling MBRP: Identifying Critical Neuroimmune Mechanisms of Action</i>	National Institute on Alcohol Abuse and Alcoholism/NIH/DHHS
Kent Hutchison, PhD, Visiting Professor	<i>Novel Approaches to Opiate Use Reduction</i>	National Institute on Drug Abuse/NIH/DHHS
Thomas Inge, MD, Professor	<i>Teen Longitudinal Assessment of Bariatric Surgery (Teen LABS) Research Project</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Alkesh Jani, MD, Professor	<i>Developing a Novel Preservation Solution for VCA Transplantation</i>	Department of the Army
Antonio Jimeno, MD, Professor	<i>Debio 1143-SCCHN-301 Randomized, double-blind placebo-controlled, Ph 3 study of Debio 1143 in combination with platinum-based chemotherapy and standard fractionation intensity modulated radiotherapy in patients with locally advanced squamous cell carcinoma of the head and neck, suitable for definitive chemoradiotherapy (TrilynX)</i>	Debiopharm,S.A

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Richard Johnson, MD, Professor Emeritus	<i>Silica Nephropathy and Chronic Kidney Disease of Unknown Etiology</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Richard Johnson, MD, Professor Emeritus	<i>Fructokinase Inhibitors for the Treatment of Alcohol Use Disorder</i>	Colorado Research Partners LLC
Sarah Jolley, MD, Assistant Professor	<i>A Phase 2 Study of BIO 300 Oral Suspension in Discharged COVID-19 Patients</i>	Humanetics Corporation
Pei-Ni Jone, MD, Professor	<i>The NIH Longitudinal Study for Multisystem Inflammatory Syndrome Therapies in Children</i>	New England Research Institutes
Craig T. Jordan, PhD, Professor	<i>Therapeutic targeting of AML stem cells</i>	Leukemia and Lymphoma Society
Peter Kabos, MD, Associate Professor	<i>BO41843 PH III randomized, double-blind, placebo-controlled multi-center study evaluating the efficacy and safety of GDC-9545 combined with palbociclib compared with letrozole combined with palbociclib in patients with estrogen receptor-positive, HER-2 negative, locally advanced or metastatic breast cancer</i>	Genentech, Inc.
Manali Kamdar, MD, Associate Professor	<i>POLATUZUMAB plus bendamustine plus Rituximab (POLA + BR) as salvage therapy prior to autologous stem cell transplant for patients with relapsed or primary refractory diffuse large B-cell lymphoma</i>	Genentech, Inc.
Manali Kamdar, MD, Associate Professor	<i>A Phase 2, open-label, single-arm, multicohort, multi-center trial to evaluate the efficacy and safety of JCAR017 in adult subjects with relapsed or refractory indolent B-cell non-hodgkin lymphoma (NHL) (transcend FL)</i>	Celgene Corporation

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Madeleine Kane, MD, PhD, Professor Emerita	<i>Paul Calabresi Award in Clinical Oncology Research</i>	National Cancer Institute/NIH/DHHS
Ross Kedl, PhD, Professor	<i>CD8 T cell and B cell collaboration following subunit vaccination</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Ross Kedl, PhD, Professor	<i>Mechanisms of combined CD40/TLR adjuvant-elicited cellular immunity</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Allison Kempe, MD, MPH, Professor	<i>The HPV9-10 Trial: Early Initiation of HPV Vaccination</i>	National Cancer Institute/NIH/DHHS
Jessica Kendrick, MD, Professor	<i>Effect of Alkali Therapy on Vascular and Graft Function in Kidney Transplant Recipients</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Matthew Kennedy, PhD, Associate Professor	<i>Novel approaches for interrogating and manipulating synaptic function, structure and plasticity</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS
Matthew Kennedy, PhD, Associate Professor	<i>Postsynaptic kinase/phosphatase networks in amyloid beta-induced synaptic dysfunction</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS
Drew Scott Kern, MD, MS, Associate Professor	<i>An extension of Study M15-741 evaluating the safety and tolerability of ABBV-951 in subjects with Parkinson's disease</i>	Abbvie, Inc.
Drew Scott Kern, MD, MS, Associate Professor	<i>An Open-Label Extension Of Study M15-736 To Evaluate The Safety And Tolerability Of 24-Hour Daily Exposure Of ABBV-951 In Subjects With Advanced Parkinson's Disease</i>	Abbvie, Inc.

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Elizabeth Kessler, MD, Associate Professor	<i>ABC123: A framework for goal concordant care in advanced bladder cancer</i>	American Cancer Society
Elizabeth Kessler, MD, Associate Professor	<i>MK-3475-905-02 Randomized Ph 3 Study Evaluating Cystectomy with Perioperative Pembrolizumab and Cystectomy with Perioperative Enfortumab Vedotin and Pembrolizumab versus Cystectomy Alone in Cisplatin-Ineligible Participants with Muscle-Invasive Bladder Cancer</i>	Merck, Sharp and Dohme Corp
Elizabeth Kessler, MD, Associate Professor	<i>MK-3475-991-00 Ph 3, Randomized, Double-blind Trial of Pembrolizumab (MK-3475) Plus Enzalutamide Plus ADT Versus Placebo Plus Enzalutamide Plus ADT in Participants With Metastatic Hormone-Sensitive Prostate Cancer</i>	Merck Sharp & Dohme Corp
Jeffrey Scott Kieft, PhD, Professor	<i>Structure, function, and dynamics of viral RNAs and RNA-containing complexes</i>	National Institute of General Medical Sciences/NIH/DHHS
Sunnie Kim, MD, Assistant Professor	<i>8951-CL-0301 Ph 3, Global, Multi-Center, Double-Blind, Randomized, Efficacy Study of Zolbetuximab (IMAB362) Plus mFOLFOX6 Compared with Placebo Plus mFOLFOX6 as First-line Treatment of Subjects with Claudin (CLDN)18.2-Positive, HER2-Negative, Locally Advanced Unresectable or Metastatic Gastric or Gastroesophageal Junction (GEJ) Adenocarcinoma</i>	Astellas Pharma Global Development, Inc.
Achim Klug, PhD, Associate Professor	<i>The contributions of age related changes in the sound localization pathway to central hearing loss</i>	National Institute on Deafness and Other Communication Disorders/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Kyle Knierim, MD, Associate Professor	<i>Jail-Based Behavioral Health Services Improvement Project</i>	Colorado Department of Human Services
Elizabeth Kovacs, PhD, Professor	<i>Aging, Macrophage Mediators, and Burn Trauma</i>	National Institute on Aging/NIH/DHHS
Nancy Krebs, MD, MS, Professor	<i>Nutrition-specific interventions to improve long-term maternal-child health outcomes</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Nancy Krebs, MD, MS, Professor	<i>Predicting Health Outcomes of Mediterranean Diet via Metabolomics of Foods and Biospecimens</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Tunuguntla Rajendra Kumar, PhD, Professor	<i>FSH Glycoforms and Ovarian Signaling Pathways</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Tatiana Kutateladze, PhD, Professor	<i>Targeting acetylated histone H4 by MLL4</i>	National Institute on Aging/NIH/DHHS
Jean Kutner, MD, MPH/MSPH, Professor	<i>Palliative Care Research Cooperative Group (PCRC): Refinement and Expansion</i>	National Institute of Nursing Research NIH/DHHS
Jean Kutner, MD, MPH/MSPH, Professor	<i>Multimeric HIV-1 Integrase Inhibitors</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Mamuka Kvaratskhelia, PhD, Professor	<i>Ultra-potent HIV capsid inhibitors</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Julie Lang, PhD, Assistant Research Professor	<i>Characterizing and Improving Humanized Immune System Mouse Models</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Alexis Leal, MD, Assistant Professor	<i>A Phase II study of Cabozantinib and Nivolumab in Refractory Metastatic Microsatellite Stable (MSS) Colorectal Cancer</i>	Exelixis, Inc.
Kristina Legget, PhD, MA, Assistant Professor	<i>Sex-based differences in the neuronal mechanisms of food intake behavior</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Laurel Lenz, Jr., PhD, Professor	<i>NK cell IL-10 production during bacterial infections</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Myron Levin, MD, Professor	<i>Persistence of protection conferred by Shingrix against Herpes Zoster in older adults</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Myron Levin, MD, Professor	<i>NICHD International, Domestic, Pediatric, Maternal HIV/AIDS Coordinating Center</i>	Westat, Inc.
Myron Levin, MD, Professor	<i>Progress Report, Part D Women, Infants, Children, and Youth (WICY) Services, FY 2016</i>	Health Resources and Services Administration/DHHS
Myron Levin, MD, Professor	<i>CoVPN 3003 ENSEMBLE FHI</i>	Family Health International
Ken Liechty, MD, Professor	<i>Advancing small molecule CXCR4 agonists for diabetic wound healing</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Ken Liechty, MD, Professor	<i>Modulation of Inflammation and Oxidative Stress in Diabetic Wound Healing</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Emily Lindley, PhD, Assistant Professor	<i>Colorado Cannabis Research Consortium (C2RC): Research Program for the Management of Chronic Spine Pain and Reduction of Prescription Opioid Use. Marijuana</i>	Colorado Department of Public Health and Environment/COLO

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Catherine Lozupone, PhD, Associate Professor	<i>Dietary and synbiotic strategy to limit gut microbiome dysbiosis and protect against Clostridioides difficile infection</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Hillary Lum, MD, Associate Professor	<i>Effectiveness of Engaging in Advance Care Planning Talks (ENACT) Group Visits Intervention in Primary Care for Older Adults with and without Alzheimer's Dementia</i>	National Institute on Aging/NIH/DHHS
Wendy Macklin, PhD, Distinguished Professor	<i>The role of mTOR signaling in oligodendrocyte differentiation and CNS myelination</i>	National Institute of Neurological Disorders and Stroke/NIH/DHHS
Chelsea Marie Magin, PhD, Assistant Professor	<i>Hybrid Hydrogel Biomaterials Comprising Clickable Decellularized Extracellular Matrix for Engineering Dynamic 3D Models of Fibrosis</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Daniel Matlock, MD, MPH, Professor	<i>A Multicenter Trial of a Shared Decision Support Intervention for Patients offered implantable Cardioverter-defibrillators: DECIDE – ICD Trial</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Kathleen Matz, MA, Instructor	<i>Child Welfare Training System Central Management Organization</i>	Colorado Department of Human Services
Jose Mayordomo, MD, PhD, Professor	<i>AL-TNBC-01 Ph 2, Multi-Center, Open-label, single-arm Study of AL101 Monotherapy in Patients with Notch Activated Triple Negative Breast Cancer</i>	Ayala Pharmaceuticals, Inc.
Jose Mayordomo, MD, PhD, Professor	<i>M16-573 Ph 1 First-in-Human Study with ABBV-155 Alone and in Combination with Taxane Therapy in Adults with Relapsed and/or Refractory Solid Tumors</i>	AbbVie, Inc.
Timothy McKinsey, PhD, Professor	<i>Regulation of Chromatin Signaling in Heart Failure by the BRD4 Bromodomain Protein</i>	National Heart, Lung, and Blood Institute/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Timothy McKinsey, PhD, Professor	<i>Deacetylase-Dependent Control of Diastolic Dysfunction and HFpEF</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Theresa Medina, MD, Assistant Professor	<i>MK-3475-U02-02C-00 Pha 1/2 Open-Label Rolling-Arm Umbrella Platform Design of Investigational Agents With or Without Pembrolizumab or Pembrolizumab Alone in Participants with Melanoma (KEYNOTE-U02): Substudy 02C</i>	Merck Sharp & Dohme Corp
Theresa Medina, MD, Assistant Professor	<i>IMCgp100-201 Ph Ib/II Open-label, Multi-center Study of the Safety and Efficacy of IMCgp100 in Combination with Durvalumab (MEDI4736) or Tremelimumab or the Combination of Durvalumab and Tremelimumab Compared to IMCgp100 Alone in Patients with Advanced Melanoma-201</i>	IMMUNOCORE
Theresa Medina, MD, Assistant Professor	<i>MK-3475-U02-02A-00 Pha 1/2 Open-Label Rolling-Arm Umbrella Platform Design of Investigational Agents With or Without Pembrolizumab or Pembrolizumab Alone in Participants with Melanoma (KEYNOTE-U02): Substudy 02A</i>	Merck Sharp & Dohme Corp
Theresa Medina, MD, Assistant Professor	<i>MK-3475-U02-02B-00 Ph 1/2 Open-Label Rolling-Arm Umbrella Platform Design of Investigational Agents With or Without Pembrolizumab or Pembrolizumab Alone in Participants with Melanoma (KEYNOTE-U02): Substudy 02B</i>	Merck Sharp & Dohme Corp
Xianzhong Meng, MD, PhD, Professor	<i>Suppression of AVIC inflammation for prevention of CAVD progression</i>	National Heart, Lung, and Blood Institute/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Luisa Mestroni, MD, Professor	<i>Cardiomyocyte phenotype and mechanotransduction in Filamin C gene variants causing arrhythmogenic cardiomyopathy</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Aaron Michels, MD, Associate Professor	<i>Autoantigens targeted by CD8 T cells in type 1 diabetes: from islets to blood</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Shelley Miyamoto, MD, Professor	<i>Targeting Mitochondria in Single Ventricle Heart Disease</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Linda Montgomery, MD, Professor	<i>COFM Expansion Slot 1</i>	University of Colorado Hospital
Ernest Moore, MD, Distinguished Professor	<i>Impact of REBOA and Tranexamic Acid on Clot Structure and Secondary Brain Injury Following Severe Polytrauma, Hemorrhagic Shock, and Traumatic Brain Injury</i>	Us Army Medical Research Acquisition Act
Thomas Edward Morrison, PhD, Professor	<i>Impairment of B cell Responses by Pathogenic Chikungunya Viruses</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Christian Mosimann, PhD, Associate Professor	<i>Chemical Modulation of bromodomain function in development and disease</i>	University of Zurich
Nee-Kofi Mould-Millman, MD, Associate Professor	<i>Epidemiology and Outcomes of Combat-Relevant Prolonged Trauma Care: a Prospective Multicenter Prehospital Study in South Africa</i>	Us Army Medical Research Acquisition Act
Maria Acena Nagel, MD, Research Professor	<i>A major contributor of serious multisystem disease in the elderly: varicella virus-induced inflammation</i>	National Institute on Aging/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Stephanie J. Nakano, MD, Assistant Professor	<i>Immunophenotyping in Pediatric Patients with Single Ventricle Congenital Heart Disease: Connecting Inflammatory and Immune Dysregulation with Outcomes</i>	Additional Ventures
Maki Nakayama, MD, Associate Professor	<i>Autoantigens targeted by CD8 T cells in type 1 diabetes: from islets to blood</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Michael Narkewicz, MD, Professor	<i>Longitudinal Study of Cystic Fibrosis Liver Disease (CFLD)</i>	Cystic Fibrosis Foundation
Donald Nease, Jr., MD, Professor	<i>Colorado Community Engagement Alliance Against COVID-19 Disparities (CO-CEAL)</i>	RTI International
Keith Benjamin Neeves, PhD, Professor	<i>A systems biology approach to identifying the mechanisms of sex hormone-induced thromboembolism in pre-menopausal women</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Paul Norman, PhD, Associate Professor	<i>Insights Into Immune-Related Diseases Born from Population Genomics</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
David Norris, MD, Professor	<i>JAK Inhibition in Down Syndrome</i>	National Institute of Arthritis & Musculoskeletal and Skin Diseases/NIH/DHHS
Kristen Lynn Nowak, PhD, MPH, Associate Professor	<i>Daily Caloric Restriction in Overweight and Obese Adults with ADPKD</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Eva Nozik, MD, Professor	<i>SOD3 regulation of redox sensitive signaling in pulmonary vascular diseases</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Eva Nozik, MD, Professor	<i>Cardiac dysfunction after ischemic AKI in mice</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Eva Nozik, MD, Professor	<i>Modulation of Inflammation and Oxidative Stress in Diabetic Wound Healing</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
David Olds, PhD, Professor	<i>Influence of Prenatal and Early Childhood Home-Visiting by Nurses on Development of Chronic Disease: 29-year Follow-Up of a Randomized Clinical Trial</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Scott Charles Newcomer Oliver, MD, Associate Professor	<i>A Phase III, Multi-center, randomized study of the efficacy, safety, and pharmacokinetics of the port delivery system with Ranibizumab in patients with diabetic retinopathy (Pavilion)</i>	Genentech, Inc.
Tamara Kay Oser, MD, Associate Professor	<i>Evaluating Feasibility of Closed Loop Automated Insulin Delivery in Primary Care and Endocrinology Settings In-Person and via Telehealth</i>	Leona M. And Harry B. Helmsley Charitable Trust
Chad Pearson, PhD, Associate Professor	<i>Centriole assembly and function for centrosome and cilia biology</i>	National Institute of General Medical Sciences/NIH/DHHS
Leigh Perreault, MD, Visiting Associate Clinical Professor	<i>PATHWEIGH: pragmatic weight management in primary care</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Irina Petrache, MD, Professor	<i>Multi-Disciplinary Research Training in Respiratory Disease</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Amber Podoll, MD, Associate Professor	<i>A Phase III, randomized, double-blind, placebo-controlled, multi-center study to evaluate the efficacy and safety of Obinutuzumab in patients with ISN/RPS 2003 class III or IV LUPUS NEPHRITIS</i>	Genentech, Inc.
Eric Poeschla, MD, Professor	<i>Novel Approaches to Innate Immunity Against HIV-1 and Other Co-infection Viruses</i>	National Institute on Drug Abuse/NIH/DHHS
Daniel Pollyea, MD, MS, Associate Professor	<i>A phase 1/2 study of ALX148 in combination with Azacitidine in patients with higher risk myelodysplastic syndrome (MDS)</i>	ALX Oncology Inc.

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Daniel Polyea, MD, MS, Associate Professor	<i>Safety and Efficacy of Venetoclax and Azacitadine for Newly Diagnosed Non-Elderly Adult Patients with Acute Myeloid Leukemia</i>	AbbVie, Inc.
Daniel Polyea, MD, MS, Associate Professor	<i>A Phase 1 First in Human Study Evaluating the Safety, Tolerability, Pharmacokinetics and Pharmacodynamics of AMG 176 in Subjects With Relapsed or Refractory Multiple Myeloma and Subjects With Relapsed or Refractory Acute Myeloid Leukemia</i>	Amgen, Inc.
Huntington Potter, PhD, Professor	<i>Phase II trial of GM-CSF/sargramostim in Alzheimer's Disease</i>	National Institute on Aging/NIH/DHHS
Martha Powell, PhD, Associate Research Professor	<i>Long Term Care Survey Process Operational Support and Analysis</i>	Insight Policy Research
Diana Quan, MD, Professor	<i>A Phase 3 Global, Open-Label, Randomized Study to Evaluate the Efficacy and Safety of ION-682884 in Patients with Hereditary Transthyretin-Mediated Amyloid Polyneuropathy</i>	Ionis Pharmaceuticals
Neda Rasouli, MD, Professor	<i>Glycemia Reduction Approaches in Diabetes: A comparative effectiveness study (GRADE)</i>	George Washington University
Judith Regensteiner, PhD, Professor	<i>Fund to Retain Clinical Scientists at the University of Colorado Anschutz Medical Campus School of Medicine</i>	Doris Duke Charitable Foundation
Judith Regensteiner, PhD, Professor	<i>The Colorado Building Interdisciplinary Research Careers in Women's Health Program</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Judith Regensteiner, PhD, Professor	<i>Role of Microvascular insulin resistance and cardiorespiratory fitness in diabetes</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Daniel Reirden, MD, Associate Professor	<i>CoVPN 5002 Prevalence Study</i>	Family Health International
Nichole Reisdorph, PhD, Associate Professor	<i>Predicting Health Outcomes of Mediterranean Diet via Metabolomics of Foods and Biospecimens</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Jane Reusch, MD, Professor	<i>Role of Microvascular insulin resistance and cardiorespiratory fitness in diabetes</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Marian Rewers, MD, Professor	<i>TEDDY USF Patient Care</i>	University of South Florida
Marian Rewers, MD, Professor	<i>Natural History of Pre-Diabetic Autoimmunity (DAISY)</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Marian Rewers, MD, Professor	<i>THE TEDDY STUDY - COLORADO CLINICAL CENTER</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Marian Rewers, MD, Professor	<i>Autoimmunity Screening for Kids (ASK)</i>	Juvenile Diabetes Research Foundation
Marian Rewers, MD, Professor	<i>ASK the Experts</i>	Leona M. And Harry B. Helmsley Charitable Trust
Molly Richards, MD, Associate Professor	<i>Reduction of Premature Discontinuation of Contraceptive Implants by Advance Provision of an OCP-Based Participant Intervention: Randomized Clinical Trial</i>	Merck Sharp & Dohme Corp
Jennifer Richer, PhD, Professor	<i>Targeting metastasis by inhibiting breast cancer metabolism and immune-suppression</i>	Congressionally Directed Medical Research Programs (ARMY/DOD)
Olivia Rissland, PhD, Assistant Professor	<i>CAREER: Protein degradation during the maternal-to-zygotic transition</i>	National Science Foundation

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Rosemary Rochford, PhD, Professor	<i>The synergistic contributions of EBV and malaria to the etiology of Burkitt lymphoma</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Carlos Roncal, MS, Associate Research Professor	<i>Silica Nephropathy and Chronic Kidney Disease of Unknown Etiology</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Cordelia Robinson Rosenberg, PhD, RN, Professor	<i>Creation of a Colorado Office of Employment First to coordinate cross-departmental efforts to implement Employment First policies, regulations, and practices. Employment First benefits people with disabilities by providing critical support related to achieving increased successful employment outcomes</i>	Colorado Department of Labor and Employment/COLO
Michael Rosenberg, MD, Assistant Professor	<i>Development of End-To-End Clinical Decision Support Tools To Prevent Cardiotoxic Drug Response</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Paul Rozance, MD, Professor	<i>Physiological Ramifications of Chorionic Somatomammotropin Deficiency</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Darleen Sandoval, PhD, Professor	<i>Mechanisms of Post-Bariatric Hypoglycemia</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Mario Santiago, PhD, Associate Professor	<i>Role of Type I IFNs in Mucosal HIV-1 Immunity and Pathogenesis</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Nanette Santoro, MD, Professor	<i>The Colorado Building Interdisciplinary Research Careers in Women's Health Program</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Laura Scherer, PhD, Assistant Research Professor	<i>Understanding effective processing of scientific evidence to promote informed choice for breast cancer screening</i>	National Cancer Institute/NIH/DHHS
Richard Schulick, MD, MBA, Professor	<i>Cancer Center Support Grant</i>	National Cancer Institute/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
David Schwartz, MD, Professor	<i>Preclinical Pulmonary Fibrosis, an opportune rare disease cohort</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
David Schwartz, MD, Professor	<i>Genes and Transcripts that Interact with MUC5B in Pulmonary Fibrosis</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
David Schwartz, MD, Professor	<i>Multi-Disciplinary Research Training in Respiratory Disease</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
David Schwartz, MD, Professor	<i>Sponsored Research and License Agreement</i>	Eleven P15, Inc.
Lauren Seeberger, MD, Professor	<i>Clinical Trial Readiness for SCA1 and SCA3</i>	Houston Methodist Research Institute
Janelle Sheeder, MPH/MSPH, Professor	<i>Contraceptive knowledge, preferences, access, and use in adolescents with chronic medical conditions, MISP 60743</i>	Merck Sharp & Dohme Corp
Douglas Sheperd, PhD, Assistant Adjoint Professor	<i>Role of VEGF in Perinatal Hypertension</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Matthew Sikora, PhD, Assistant Professor	<i>Novel roles of MDC1 in endocrine response and resistance in breast cancer</i>	American Cancer Society
Christopher Silliman, MD, PhD, Professor	<i>Mechanisms of Trauma Induced Coagulopathy</i>	National Institute of General Medical Sciences/NIH/DHHS
Ronald Sokol, MD, Professor	<i>Colorado Community Engagement Alliance Against COVID-19 Disparities (CO-CEAL)</i>	RTI International
Brian Stauffer, MD, Professor	<i>Targeting Mitochondria in Single Ventricle Heart Disease</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Andrea Steck, MD, Professor	<i>TrialNet: Data Coordinating Center for Type 1 Diabetes</i>	University of South Florida
Kurt Stenmark, MD, Professor	<i>Complement Mediated Remodeling in Pulmonary Vascular Disease</i>	National Heart, Lung, and Blood Institute/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Jennifer Stevens Lapsley, PhD, Professor	<i>Advancing Rehabilitation Paradigms for Older Adults in Skilled Nursing Facilities</i>	National Institute on Aging/NIH/DHHS
Jennifer Stevens Lapsley, PhD, Professor	<i>Progressing Home Health Rehabilitation Paradigms for Older Adults</i>	National Institute of Nursing Research NIH/DHHS
Jennifer Stevens Lapsley, PhD, Professor	<i>Movement pattern biofeedback training after total knee arthroplasty</i>	National Institute on Aging/NIH/DHHS
Christopher Stille, MD, MPH/MSPH, Professor	<i>Health System Research Network for Children and Youth with Special Health Care Needs (CYSHCNet)</i>	Health Resources and Services Administration/DHHS
Christina Studts, PhD, MSPH, LCSW, Associate Professor	<i>Behavioral Parent Training for Families With Deaf and Hard of Hearing Preschoolers</i>	National Institute on Deafness and Other Communication Disorders/NIH/DHHS
Emily J , SU, MD, MSCI, Associate Professor	<i>Mediators of impaired fetoplacental angiogenesis in fetal growth restriction</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Prem Subramanian, MD, PhD, Professor	<i>Efficacy and Safety of Bilateral Intravitreal Injection of GS010: A Randomized, Double-Masked, Placebo-Controlled Trial in Subjects Affected with G11778A ND4 Leber Hereditary Optic Neuropathy for Up to One Year</i>	GenSight Biologics
Carmen Cristina Sucharov, PhD, Professor	<i>Cardiac dysfunction after ischemic AKI in mice</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Carmen Cristina Sucharov, PhD, Professor	<i>Targeting Mitochondria in Single Ventricle Heart Disease</i>	National Heart, Lung, and Blood Institute/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Kelly Sullivan, PhD, Assistant Professor	<i>Defining the Role of DNA Rereplication of Chromosome 21 in the Development and Pathophysiology of Down Syndrome</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Lori Sussel, PhD, Professor	<i>Alternative RNA splicing events contribute to the onset of islet dysfunction in T1D</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Lori Sussel, PhD, Professor	<i>UC Denver Diabetes Research Center</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Stanley Szeffler, MD, Professor	<i>Reducing Asthma Attacks in Disadvantaged School Children with Asthma</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Stanley Szeffler, MD, Professor	<i>Colorado Comprehensive School-Centered Asthma Programs (AsthmaCOMP)</i>	Colorado Department of Public Health and Environment/COLO
Jefferson Matthew Taliaferro, PhD, Assistant Professor	<i>Control of cell division through centrosomal RNA localization</i>	W. M. Keck Foundation
Minghua Tang, PhD, Assistant Professor	<i>Dietary influence on infant growth and the gut microbiota</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Nicole Tartaglia, MD, Professor	<i>The extraordinary Babies Study: Natural History of Health and Neurodevelopment in Infants and Young Children with Sex Chromosome Trisomy</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Matthew Taylor, MD, Professor	<i>Cardiomyocyte phenotype and mechanotransduction in Filamin C gene variants causing arrhythmogenic cardiomyopathy</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Stephanie Teal, MD, Professor	<i>A multicenter, non-comparative trial on the contraceptive efficacy, safety and tolerability of LPRI-424 (dienogest 2 mg / ethinyl estradiol 0.02 mg) during 13 cycles Multicenter, Non-Comparative Trial on the Contraceptive Efficacy, Safety, Tolerability of LPRI-424, 13 Cycles</i>	Scope International

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Darcy Ann Thompson, MD, MPH/MSPH, Professor	<i>Factors influencing screen media use in low-income Mexican American toddlers</i>	National Institute of Nursing Research NIH/DHHS
Andrew Thorburn, D Phil, Professor	<i>Down Syndrome as a systemic autophagy deficiency disorder</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Joshua Michael Thurman, MD, Professor	<i>Effect of Alkali Therapy on Vascular and Graft Function in Kidney Transplant Recipients</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Daniel Tollin, PhD, Professor	<i>Developmental effects of early hearing loss on auditory information processing</i>	National Institute on Deafness and Other Communication Disorders/NIH/DHHS
Daniel Tollin, PhD, Professor	<i>The contributions of age related changes in the sound localization pathway to central hearing loss</i>	National Institute on Deafness and Other Communication Disorders/NIH/DHHS
Raul Torres, PhD, Professor	<i>Lysophosphatidic Acid Regulation of CD8 T cell activation and function</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Jason Tregellas, PhD, Professor	<i>Neuronal and behavioral effects of an implicit priming approach to improve eating behaviors in obesity</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Linda Van Dyk, PhD, Professor	<i>Therapeutic targets in gamma-herpesvirus infection</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Sujatha Venkataraman , PhD, Assistant Research Professor	<i>Novel targeting of a cell surface protein, CD99 in H3K27M-mutated DIPG</i>	Us Army Medical Research Acquisition Act
Livia Veress, MD, Professor	<i>Advanced Development of Al- tephlase as a Medical Countermeasure for Pulmonary Injury Associated with Sulfur Mustard Inhalation - Proof of Concept in a Swine Model</i>	Department of Health and Human Services
Michael Richard Verneris, MD, Professor	<i>Characterizing Innate Immune Dysregulation in Tonsils of Individuals with Down Syndrome</i>	National Heart, Lung, and Blood Institute/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Victor M Villalobos, MS, Professional Research Assis- tant	<i>XmAb23104-01 Ph 1 Multiple Dose Study to Evaluate the Safe- ty and Tolerability of XmAb(R)23104 in Subjects with Selected Advanced Solid Tumors (DUET-3)</i>	Xencor, Inc
Timothy Vollmer, MD, Professor	<i>Evaluating the Feasibility of Pan- demic Forward, Telehealth Based Home Based Infusions for Ocreli- zumab Users: Measuring Patient Experiences and Safety Out- comes</i>	Genentech, Inc.
Jing Hong Wang, MD, PhD, Associate Professor	<i>Mechanisms of dual inhibition of TGFbeta/PD-L1 in HNSCC</i>	National Institute of Dental and Craniofacial Research/NIH/DHHS
Kia M Washington, MD, Professor	<i>A Comprehensive Approach to Whole Eye Transplantation: Building a Scientific Foundation for New Therapies in Vision Res- toration</i>	Us Army Medical Research Acquisition Act
Adriana Weinberg, MD, Professor	<i>Persistence of protection con- ferred by Shingrix against Herpes Zoster in older adults</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Mary Weiser-Evans, PhD, Professor	<i>PTEN promoter hypermethyla- tion underlies vascular disease progression</i>	National Heart, Lung, and Blood Insti- tute/NIH/DHHS
Mary Weiser-Evans, PhD, Professor	<i>Reprogramming of mature smooth muscle cells to vascular progenitor cells</i>	National Heart, Lung, and Blood Insti- tute/NIH/DHHS
Stephanie R. Wesolowski, PhD, Associate Professor	<i>Nutrient and insulin metabolic actions in IUGR fetal liver</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Carl White, MD, Professor	<i>New Developments in Chemical Countermeasures: CounterACT 2018</i>	National Institute of Environmental Health Sciences/NIH/DHHS

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Amanda Camp Wieland, MD, Assistant Professor	<i>A Seamless, Adaptive, Phase 2b/3, Double-Blind, Randomized, Placebo-controlled, Multicenter, International Study Evaluating the Efficacy and Safety of Belpectin (GR-MD-02) for the Prevention of Esophageal Varices in NASH Cirrhosis</i>	Galectin Therapeutics Inc.
Breelyn Ann Wilky, MD, Associate Professor	<i>XmAb23104-01 Ph 1 Multiple Dose Study to Evaluate the Safety and Tolerability of XmAb(R)23104 in Subjects with Selected Advanced Solid Tumors (DUET-3)</i>	Xencor, Inc
Cara Wilson, MD, Professor	<i>Role of Type I IFNs in Mucosal HIV-1 Immunity and Pathogenesis</i>	National Institute of Allergy and Infectious Diseases/NIH/DHHS
Cara Wilson, MD, Professor	<i>Medical Scientist Training Program</i>	National Institute of General Medical Sciences/NIH/DHHS
Shale Wong, MD, Professor	<i>Moving AHEAD: Advocating for Health Equity through Arts and Dance</i>	Colorado Health Foundation
Junwang XU, PhD, Associate Professor	<i>Advancing small molecule CXCR4 agonists for diabetic wound healing</i>	National Institute of Diabetes and Digestive and Kidney Diseases/NIH/DHHS
Ivana Yang, PhD, Professor	<i>Genes and Transcripts that Interact with MUC5B in Pulmonary Fibrosis</i>	National Heart, Lung, and Blood Institute/NIH/DHHS
Michael Yeager, PhD, Associate Clinical Professor	<i>RAT21: Generation and Characterization of Rat Models of Down Syndrome</i>	Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)/NIH/DHHS
Liping Yu, MD, Associate Research Professor	<i>Core Clinical Laboratory for Type 1 diabetes Research Trials</i>	University of South Florida

New Research Grants > \$500,000 Awarded 2020-2021

Name	Title	Funding Agency
Xiaoli Yu, PhD, Assistant Research Professor	<i>Development of Validation of Phage-Displayed Random Peptide Libraries Technologies for Rapid Isolation and Characterization of Extracellular Vesicles from Patients with Brain Tumors</i>	National Institute of Mental Health/NIH/DHHS
Rui Zhao, PhD, Professor	<i>Role of Eya3 in regulating the immune microenvironment to promote breast tumor progression</i>	National Cancer Institute/NIH/DHHS
Michael John Zuscik, PhD, Professor	<i>Studies on gut microbiome-joint connections in arthritis</i>	National Institute of Arthritis & Musculoskeletal and Skin Diseases/NIH/DHHS



Office of Grants and Contracts
University of Colorado Denver Awards by School
Award Trends - Fiscal Year to Date 2020 and 2021

Office of Grants and Contracts
 University of Colorado Denver | Anschutz Medical Campus
 Award Trends - Fiscal Year 2020 and 2021
 Awards by School/Department

School/College/Chancellor's Office	Department/Division/Center	FY 2020			FY 2021			% of FY 20 Funding
		Direct Cost	Indirect Cost	Total Cost	Direct Cost	Indirect Cost	Total Cost	
Academic and Student Affairs (DDC)	Library (Anschutz)	5,000	0	5,000	176,777	33,935	160,712	32.14%
	Library (DDC)	15,037	0	15,037	31,783	0	31,783	21.1%
Central Services Administration (Anschutz)	Anschutz Innovation	1,068,851	410,708	1,479,559	2,724,820	1,067,744	3,792,564	256%
	University Police				55,079	14,321	69,400	
	Total CSA	1,068,851	410,708	1,479,559	2,779,899	1,082,065	3,861,964	139%
CSA Centers and Institutes (Anschutz)	Center for Behavioral Health Initiatives	21,176	5,506	26,682	10,053	2,614	12,667	47%
	Center on Aging	3,430,290	1,521,708	4,951,998	4,184,887	1,708,944	5,893,831	119%
	Health Affairs Health Care Ethics	799,348	16,292	815,640	875,505	16,105	891,610	109%
	Colorado Center for Personalized Medicine	1,559,067	383,002	1,942,069	2,095,045	344,130	2,439,175	126%
	Colorado Clinical Translational Sciences Insti	7,810,051	2,379,740	10,189,791	11,357,135	3,825,818	15,272,953	150%
	Marcus Brain Institute	9,124,946	319,845	9,444,791	4,372,418	363,836	4,736,254	50%
	Total CSA Centers and Institutes (Anschutz)	22,744,878	4,626,091	27,370,969	22,872,823	6,371,247	29,244,070	128%
Central Service Administration (DDC)		0	0	0	296,298	23,704	320,000	
College of Architecture and Planning		914,215	85,275	979,490	787,551	25,338	812,889	83%
College of Arts and Media		60,000	0	60,000	187,048	104,312	292,260	487%
College of Engineering and Applied Sc		4,094,919	1,252,467	5,347,386	5,002,363	1,239,950	6,242,334	117%
College of Liberal Arts and Sciences		4,569,612	1,532,154	6,101,766	6,590,203	2,219,404	8,809,607	144%
College of Nursing		4,948,717	1,270,902	6,219,620	7,353,569	1,249,034	8,602,605	138%
The Business School		62,496	26,248	88,747	0	0	0	100%
The Graduate School		795,032	44,721	839,753	787,599	30,589	798,188	95%
School of Dentistry		3,788,675	1,124,898	4,913,573	2,441,825	677,865	3,119,791	63%
School of Education and Human Devel		2,216,265	412,887	2,631,152	3,755,822	473,529	4,229,351	161%
School of Medicine	Anesthesiology	5,313,233	2,420,190	7,733,423	3,927,034	1,480,000	5,407,034	70%
	Biochem/Biophys/Molecular Genetics	12,559,611	5,347,254	17,906,865	7,825,130	3,789,187	11,614,317	62%
	Cell and Developmental Bio	10,277,526	4,076,072	14,353,598	4,917,096	2,110,182	7,027,278	49%
	Dean's Office	40,000	0	40,000	327,272	32,728	360,000	100%
	Dermatology	3,521,805	1,217,612	4,739,417	2,166,846	606,060	2,772,906	59%
	Emergency Medicine	10,957,864	3,432,816	14,390,680	12,320,537	3,626,378	15,946,915	111%
	Family Medicine	8,588,175	1,583,485	10,171,660	4,530,036	666,695	5,246,731	52%
	Graduate Medical Education	0	0	0	59,999	0	59,999	
	Immunology Microbiology	15,353,798	5,758,842	21,112,641	14,261,323	5,681,524	19,942,847	94%
	Medicine	67,780,272	28,296,100	96,076,372	97,094,408	35,950,504	133,044,913	112%
	Neurology	18,302,174	4,891,023	23,193,197	19,070,884	5,451,074	24,521,958	116%
	Neurosurgery	3,804,650	1,158,003	4,962,653	2,500,777	938,658	3,439,435	69%
	Obstetrics and Gynecology	5,432,481	1,649,095	7,081,576	6,668,311	2,179,371	8,847,682	125%
	Ophthalmology	3,952,974	1,277,989	5,230,963	4,954,070	1,666,858	6,620,928	127%
	Orthopedics	3,271,572	1,086,448	4,358,021	4,747,308	1,070,711	5,818,019	134%
	Otolaryngology	2,813,721	1,005,745	3,819,466	3,001,354	1,356,003	4,357,357	114%
	Pathology	2,934,934	1,281,474	4,216,408	2,857,058	953,556	3,810,614	90%
	Pediatrics	55,420,557	12,530,044	67,950,602	69,288,882	18,584,779	87,873,661	129%
	Pharmacology	10,133,067	4,076,670	14,211,737	13,593,090	6,648,568	20,241,658	142%
	Physiology/Biophysics	4,516,254	1,839,841	6,356,095	5,113,152	2,392,342	7,505,494	118%
	Psychiatry	10,219,947	2,695,035	12,914,982	12,070,489	2,656,821	14,727,310	114%
	Radiation Oncology	974,250	395,714	1,369,964	2,498,487	704,067	3,202,554	235%
	Radiology	2,178,525	427,790	2,606,315	1,861,454	400,327	2,261,781	87%
	Rehabilitation Medicine	4,912,632	1,149,940	6,062,572	5,982,631	815,471	6,798,102	112%
	Surgery	6,464,966	3,109,841	9,574,807	12,405,936	4,345,117	16,751,054	145%
	Total School of Medicine	289,706,999	90,702,671	380,409,670	314,197,454	103,466,980	417,664,434	110%
SOM Institutes and Centers	Barbara Davis Center	18,602,823	5,800,767	24,403,590	14,933,218	5,185,518	20,118,736	79%
	Cancer Center	3,126,123	9,224,914	12,351,037	36,485,606	10,641,612	47,127,222	118%
	Center of Bioengineering	3,796,573	1,147,484	4,944,057	4,095,627	1,038,319	5,133,946	104%
	Colorado Health Outcomes	24,948,183	6,640,525	31,588,708	14,931,426	3,965,380	18,896,806	60%
	Depression Center	17,795	4,643	22,438	4,762	1,238	6,000	27%
	Health and Wellness Center	1,890,678	929,939	2,820,617	493,672	147,546	641,218	23%
	Linda Crnic Institute	2,931,305	1,506,786	4,438,091	4,363,692	2,088,603	6,452,295	145%
	Webb-Waring Center	450,550	222,648	673,198	57,897	4,618	62,515	9%
	Total SOM Institutes and Centers	84,390,230	25,470,604	109,860,834	75,395,700	23,051,826	98,447,526	89%
	Total SOM Department/Centers	374,606,229	116,182,365	490,788,595	389,593,154	126,518,813	516,081,981	105%
School of Pharmacy		11,816,483	5,084,451	16,900,933	10,149,383	4,710,509	14,869,893	87%
School of Public Affairs		1,077,080	112,861	1,189,941	1,622,979	268,330	1,891,309	159%
School of Public Health		29,687,844	6,697,586	36,385,430	36,859,790	9,298,527	46,158,317	125%
	Total	463,456,896	139,105,186	602,562,083	492,608,092	164,558,364	647,166,474	107%

	FY 2020			FY 2021		
	Direct Cost	Indirect Cost	Total Cost	Direct Cost	Indirect Cost	Total Cost
Anschutz Medical Campus	449,761,869	135,641,702	585,403,573	472,914,719	149,981,586	622,896,321
Denver Campus	13,695,027	3,463,484	17,158,510	19,693,373	4,576,778	24,270,153
	463,456,896	139,105,186	602,562,083	492,608,092	154,558,364	647,166,474

The Office of the Dean proudly presents the
2021-2022 Dean's Distinguished Seminar Series

All seminars will be held on the Anschutz Medical Campus, (unless otherwise noted),
in the Research North building, Hensel Phelps West Auditorium, 4:00-5:00pm.

Prior to each seminar, lecture topics will be announced.

Please follow the hyperlinks below to learn more about our speakers
and their fields of expertise.

For questions about the series, contact Judy Sherman, 303-724-5375, judy.sherman@cuanschutz.edu

Tuesday, September 14, 2021

**Via Zoom. Link will be provided.*

[KATHARINE HAYHOE, PHD](#)

Chief Scientist with The Nature Conservancy
Endowed Professor in Public Policy and Public Law
Paul W. Horn Distinguished Professor
Texas Tech University

Tuesday, November 9, 2021

[MELISSA GILLIAM, MD, MPH](#)

Executive Vice President and Provost
The Ohio State University

Tuesday, January 11, 2022

[MERCEDES CARNETHON, PHD](#)

Vice Chair, Department of Preventative Medicine
Mary Harris Thompson Professor
Preventative Medicine (Epidemiology) and
Medicine (Pulmonary and Critical Care)
Northwestern University Feinberg School of Medicine

Tuesday, February 8, 2022

**Via Zoom. Link will be provided.*

[EFFIE WANG PETERSDORF, MD](#)

Professor
Clinical Research Division
Madeline Dabney Adams Endowed Chair in AML Research
Fred Hutchinson Cancer Research Center

Tuesday, March 8, 2022

[JOAN STEITZ, PHD](#)

Sterling Professor of Molecular Biophysics and Biochemistry
Investigator, Howard Hughes Medical Institute
Yale School of Medicine

Tuesday, April 12, 2022

**Via Zoom. Link will be provided.*

[DIANA W. BIANCHI, MD](#)

Senior Investigator, Medical Genetics Branch
NIH – National Human Genome Research Institute
Director, Eunice Kennedy Shriver National
Institute of Child Health and Human Development

Tuesday, May 10, 2022

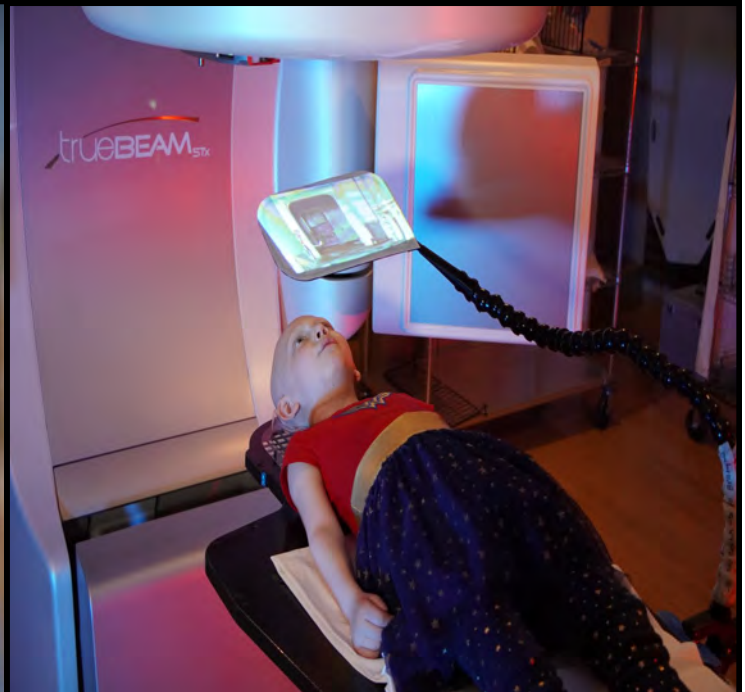
[RUGANG ZHANG, PHD](#)

Deputy Director, The Wistar Institute Cancer Center
Christopher M. Davis Endowed Professor & Program Leader,
Immunology, Microenvironment
& Metastasis Program



School of Medicine

UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS



Top left photo courtesy of **@anschutzwell Instagram, September 2021**: “Our team of Group Exercise instructors is ready to meet you in the center and online! Check out this month’s classes, including Cardio Barre with Karen (pictured), through the link in our bio.”

Top right photo courtesy of the Barbara Davis Center for Diabetes.

Bottom left photo courtesy of the Marcus Institute for Brain Health.

Bottom right photo courtesy of **@colorado.cancer Instagram, April 26, 2021**: “In 2018 CU Cancer Center member, Brian Miller, PhD, and Douglas Holt, MD, [@cumedschool](#) fellow, created Radflix, a radiotransparent projector screen that plays videos to distract young patients during cancer treatments.”

Centers, Institutes and Programs



The photo above is courtesy of @anschutzwell Instagram, September 13, 2021: "Congratulations Mandi, Chad, Lauren, Emily, Phil, Rob, Tim, Rhett, Zach, and Jimmy for breaking the Guinness World Records' most pounds dead-lifted in one hour on September 12th!"

Adult and Child Consortium for Health Outcomes Research and Delivery Science

Supported by the University of Colorado School of Medicine and Children's Hospital Colorado (CHCO), the Adult and Child Consortium for Health Outcomes Research and Delivery Science (ACCORDS) provides a collaborative and multi-disciplinary environment that supports outcomes, health services, and implementation research for CU Anschutz faculty. The founding Director is **Allison Kempe, MD, MPH**.

ACCORDS brings together T3-T4 researchers from across the CU Anschutz Medical Campus. Research consultation, training, and help with grant preparation is available to all School of Medicine faculty. ACCORDS also collaborates with the Colorado School of Public Health, the Skaggs School of Pharmacy and Pharmaceutical Sciences, and the College of Nursing. ACCORDS has strong research affiliations with the Colorado Clinical and Translational Sciences Institute (CCTSI), Denver Health, Kaiser Permanente, U.S. Department of Veterans Affairs, Colorado Department of Public Health and Environment, and the Colorado Department of Health Care Policy and Financing. **ACCORDS is an incubator for research ideas, fosters interdisciplinary collaboration, and develops focused areas of research of national prominence.**



Consultations

We provide over
350 research consultations
across 25 different
campus departments/
divisions



Grant Proposals

We help
65 research investigators
submit over
100 grant proposals



Grant Success

We have a
35% success rate
for federally
awarded grants

The mission of ACCORDS is to improve health, locally and nationally, by supporting state-of-the-art outcomes and community translational research to guide clinical practice and health policy.

The objectives of ACCORDS are to

- Increase competitiveness of the School of Medicine/CHCO for funding from multiple research, education, and training program sponsors, especially Patient-Centered Outcomes Research Institute, the Agency for Healthcare Research and Quality, and the National Institutes of Health;
- Strengthen affiliations with key external partners, including Denver Health, U.S. Department of Veterans Affairs, Kaiser Permanente, and the Colorado Department of Public Health and Environment, to increase access to populations and collaborators necessary for certain grants;
- Improve faculty development for both senior and junior faculty interested in outcomes and delivery research by providing an interdisciplinary home for developing research, a mentored training ground, and substantial educational activities;
- Improve the ability of the School of Medicine/CHCO to recruit senior and junior faculty interested in health outcomes, health services research, dissemination and implementation science, comparative effectiveness, and patient-centered outcomes research; and
- Achieve greater national visibility for the School of Medicine/CHCO in the areas of health outcomes, dissemination and implementation science, comparative effectiveness research, and training.



Early Career Faculty

We support over **50 junior faculty members** with **Career Development Awards**



Fellowships

We train **post-doctoral professionals** to become **primary care research leaders** addressing the nation's primary care health delivery challenges



Educational Offerings

We offer **12+ campus seminars & workshops** yearly, with approximately **700 attendees**

CORES:

- Qualitative & Mixed Methods
- Biostatistics & Analysis
- Economic Analysis
- Mobile Health & Informatics
- Practice-Based Research Network (with CCTSI)



PROGRAMS:

- Dissemination & Implementation (D&I) Science
- Colorado Program for Patient-Centered Decisions
- Community Engagement & Outreach (with CCTSI)
- Data Science
- Research Training & Mentorship
- Education

<https://medschool.cuanschutz.edu/accords>



ACCORDS

ADULT AND CHILD CONSORTIUM FOR HEALTH OUTCOMES
RESEARCH AND DELIVERY SCIENCE

UNIVERSITY OF COLORADO | CHILDREN'S HOSPITAL COLORADO

University of Colorado Alzheimer's and Cognition Center

The University of Colorado Alzheimer's and Cognition Center (CUACC) is designated by the Colorado Legislature as the "University of Colorado School of Medicine's Dementia Diseases and Related Disabilities Treatment and Research Center." Our tagline is: "Healthy Brain Aging Starts Here."

At the CUACC, we are providing standard and innovative clinical care to our patients while advancing research into effective early diagnostics, preventions, treatments, and, ultimately, cures for Alzheimer's disease and other neurodegenerative diseases and conditions. In the Memory Disorders Clinic of the CUACC, we assess and care for aging patients with late-onset Alzheimer's disease, younger patients with early-onset Alzheimer's disease, patients with non-memory/atypical Alzheimer's disease, patients with related dementias and with developmental disorders such as Down syndrome, thus serving as a premier, comprehensive Alzheimer's disease center. We also support clinical, translational, preclinical, and basic science research aimed at improving the diagnosis, treatment, and prevention of Alzheimer's disease and related dementias, including Down syndrome.

CUACC Director **Huntington Potter, PhD**, is Kurt N. and Edith von Kaulla Memorial Professor of Neurology, vice chair for basic research in neurology, and director of the Alzheimer's Disease Program for the Linda Crnic Institute for Down Syndrome. **Samantha Holden, MD**, assistant professor of neurology, is director of the memory disorders clinic and has taken over medical directorship of the neurology clinic. **Brianne Bettcher, PhD**, associate professor of neurology, is director of neuropsychology research. Victoria Pelak, MD, professor of neurology and ophthalmology, serves as vice chair of faculty affairs for the Department of Neurology. Christopher M. Filley, MD, professor of neurology and psychiatry, is director of the behavioral neurology section and senior scientific advisor at the Marcus Institute for Brain Health. Al Anderson, MD, is director of the behavioral neurology and neuropsychiatry fellowship program. Brice McConnell, MD, PhD, assistant professor of neurology, is director of the sleep research program. Integral to both the CUACC clinical care and research are Assistant Professors Peter Pressman, MD, Zachary Macchi, MD, Delia Bakeman, DO, and Jessica Solomon Sanders, MD, and Instructor/Fellow Tara Carlisle, MD. They are all aided by a team clinical staff including two advanced practice providers, two clinical nurses, and clinical coordinators.

The CUACC neurobehavior and memory disorders clinic, directed by Samantha Holden, saw 2,492 unique patients last year. The clinic also includes the neuropsychology clinic. Closely allied with the memory disorders clinic is CUACC neuro-ophthalmologist/behavioral neurologist Victoria Pelak, whose office is on the Anschutz Medical Campus.

While the COVID-19 pandemic has been challenging for CUACC patients, clinicians, and researchers, our clinical care and laboratory research have now returned to pre-COVID levels.

The CUACC has recently published the results of its clinical trial to assess the safety and efficacy of Granulocyte-Macrophage Colony Stimulating Factor (GM-CSF/Leukine[®]) as a treatment for mild-to-moderate Alzheimer's disease, showing that it was safe and also showing potential improvement in memory. The FDA is in the process of reviewing our revised protocol for the longer six-month efficacy trial for Leukine[®], and we anticipate beginning recruitment in late 2021. A recent study led by Md. Mahiuddin Ahmed, PhD, from the CUACC Laboratory shows that GM-CSF improves memory/learning in animal models of Down syndrome and normal aging. Work in collaboration with Kenneth Tyler, MD's laboratory shows GM-CSF reduces mortality in a mouse model of West Nile virus infection, with further implications for its potential use as a treatment for COVID-19, both of which affect the brain.

The CUACC is also participating in the multi-site Biogen-sponsored phase III open label EMBARK trial to evaluate the safety and efficacy of the drug aducanumab in subjects with mild cognitive impairment or mild Alzheimer's disease. If Biogen initiates their planned Phase IV trial, we are likely to be a site. Victoria Pelak, MD, will be site-PI for both studies. Holden is site director of several clinical trials in Parkinson's disease.

Brianne Bettcher PhD's research specializes in observational studies designed to investigate the underlying causes of Alzheimer's disease and cognitive decline. Bettcher is currently leading two healthy older adult observational studies, termed LIIA and ImTAB, along with the Bio-AD study described below.

The Longitudinal Innate Immunity and Aging (LIIA) study is recruiting 200 healthy older adults with no memory concerns to learn more about how immune system markers, measured in blood and spinal fluid, relate to clinical features of aging over time. This study will also be incorporating COVID-19 antibody testing to investigate how COVID-19 affects neurological outcomes, as a part of an administrative supplement to her NIH R01 grant. The Immunity and Alzheimer's Biomarkers (ImTAB) study is learning how a mild traumatic brain injury (mTBI) in late life relates to inflammation, markers of Alzheimer's disease-related proteins, and clinical features of aging over time. The ImTAB study is sponsored through a U.S. Department of Defense (DoD) grant, and will be recruiting 125 healthy older adults over the next two years, including some who have had a mTBI in the past five years, but no significant memory or cognition concerns.

In the past four and a half years, we have enrolled 163 individuals in our ongoing, prospective longitudinal study, Bio-AD, which follows aging-related and Alzheimer's disease-related changes in a planned cohort of up to 400 aging adults, including people with Down syndrome, and will offer new insights into the causes and progression of Alzheimer's disease and related dementias while also informing the development of novel therapies. Many other CUACC investigators are also using the Bio-AD cohort for their clinical research studies. For example, Brice McConnell, MD, PhD, is leading efforts to understand the neuroprotective aspects of sleep that protect the brain from developing age-related neurodegenerative diseases, including Alzheimer's disease, and is conducting diagnostic research on sleep and memory.

Peter Pressman, MD, continues work funded by an NIH National Institute on Aging Mentored Patient-Oriented Research Career Development Award (K23) to study computational speech analysis (CSA) as a potential screening tool for patients with neurocognitive disorders. With this grant, he is investigating the utility of using CSA measures in people with Alzheimer's disease, mild cognitive impairment, other neurocognitive disorders, and healthy controls to correlate spontaneous speech measures with standardized linguistic, neuropsychological, and biological measures. He also plays key roles in community outreach to the African American and LatinX communities described below.

Research conducted by Zachary Macchi, MD, aims to enhance palliative care for patients with Alzheimer's disease, Parkinson's disease, and other forms of neurodegeneration. In particular, his current projects explore the perspectives of individuals with early-onset dementia, methods to enhance advance care planning for early stage Alzheimer's disease and related dementias, and ways to improve caregiver support.

The University of Colorado Department of Neurology Lewy Body Dementia Association Research Center of Excellence (RCOE) is directed by CUACC members Victoria Pelak, MD, and Samantha Holden, MD. In March 2021, hundreds of viewers from across the United States and throughout the world joined virtually with the CUACC to watch "SPARK: Robin Williams and his Battle with Lewy Body Dementia," and participate in a discussion led by Holden. "SPARK" is a 45-minute documentary adaptation of a feature movie "Robin's Wish" that was created by the Lewy Body Dementia Association (LBDA) and the producers of "Robin's Wish," with the support of Arcadia Pharmaceuticals "to promote community and professional awareness and education to those affected by Lewy body dementia."

Peter Pressman, MD, is now site-PI for ALLFTD, a network of 18 North American research and care centers dedicated to advancing our understanding of frontotemporal lobar degeneration (FTLD) and advancing research to develop treatments for this disorder. Pressman hosted the 2020 Cooper Conference on FTLD in Denver, held virtually.

Noah Johnson, PhD, and members of the CUACC Laboratory are continuing to study drugs they identified that inhibit critical steps in the Alzheimer's disease pathogenic pathway. Two of the effective, non-toxic drugs are long-time FDA approved for other indications, and our retrospective study shows them to increase the likelihood that human Alzheimer's disease patients will improve. The next step is to test the drugs in animal models of Alzheimer's disease and plan a clinical trial to test one of these drugs in human Alzheimer's disease patients.

Other CUACC research includes gaining an in-depth understanding of normal aging and neurodegeneration with a special focus on the role of inflammation, working to develop better diagnostic and predictive tests, both clinical and biochemical, and replicating Alzheimer's disease pathology in cerebral organoids (minibrains).

Over the last year, members of the CUACC continue to be supported by funding from the NIH, the DoD, the Alzheimer's Association, the State of Colorado, and generous philanthropists. CUACC members have published extensively and presented their latest research findings at many scientific meetings, including at the Alzheimer's Association International Conference (AAIC 2021), which was held in Denver in July. A list of recent publications can be found on our website below.

The CUACC continues to provide >60 presentations/year to the lay public with a special focus on outreach to underrepresented populations, including African American and LatinX community members. Potter and Holden were invited to update Florida Legislators on progress at the CUACC. A study group established in 2018 by former CUACC Fellow Luis Medina, PhD, and Peter Pressman, MD, using Boot Camp Translation (BCT) has been renamed the African American Alzheimer's Advisory Committee and includes 18 members. The CUACC is also a part of a grant, secured by Medina, who is now a faculty member at the University of Houston (UH), in partnership with UH and the University of Nevada, Las Vegas and is currently doing BCT with 16 members of the LatinX community in Denver, Houston, and Las Vegas called the Engaging Communities of Hispanics for Aging Research (ECHAR) network. This training also includes a translator, allowing them to provide information in both Spanish and English. The BCT process will wrap up this fall, and members will be invited to form a Community Advisory Board.

Promotions – Brianne Bettcher, PhD, was promoted to associate professor, Christina Coughlan, PhD, was promoted to assistant research professor, Heidi Chial, PhD, was promoted to assistant research professor, Md. Mahiuddin Ahmed, PhD, was promoted to senior research instructor, Noah Johnson, PhD, was promoted to senior research instructor, Athena Wang, PhD, was promoted to senior research associate, and Mihret Elos, MS, was promoted to senior professional research assistant.

Degrees Awarded – Esteban Lucero, a graduate student in Huntington Potter, PhD's laboratory, received his PhD from the Human Medical Genetics and Genomics Graduate Program.

Publications – <https://medschool.cuanschutz.edu/alzheimer/home-page/recent-publications>

Website – <http://medschool.cuanschutz.edu/alzheimers>

Anschutz Health and Wellness Center

The **CU Anschutz Health and Wellness Center (AHWC)**, established within the CU School of Medicine, opened in April 2012. Our vision is a campus where wellness is a foundation of everything we do. To foster this vision, the staff of the AHWC collaborate with campus partners to develop and deliver programs and services targeting physical activity, nutrition, and mental wellbeing that enhance the lives of people who come here. The AHWC serves as a campus resource that provides support and a space for innovation and collaboration for researchers, clinicians, patients, students, campus employees, and community members. The center is led by Director **Daniel Bessesen, MD**; Associate Director **Marc Cornier, MD**; Director of Wellness and Innovation **John Peters, PhD**; Director of Finance and Administration **Luciana Smith, MSO, MCPH**; and Director of Research and Education Integration **Paul MacLean, PhD**. More information can be found at anschutzwellness.com.

Some of the center's functional areas and programs include:

- The 30,000-square-foot **Fitness Center** features advanced exercise equipment technology, over 75 weekly group exercise classes, personal training services, massage, and motivational support for nearly 3,000 members from the campus and the surrounding community. The fitness center hosts a physician-referred supervised exercise programs designed to assist with chronic disease management. The fitness center also supports NIH funded research studies investigating the basic physiological effects of physical activity as well as the associated health benefits. Our exercise offerings expanded to include virtual platforms (<https://anschutzwellness.com/covid-19-update/>) during the COVID pandemic and continue to be offered both virtually and in person. The fitness center's virtual exercise options have been enhanced through the acquisition of a digital exercise training platform (True Fit®) and the addition of Virtual Exercise Programming (VXP).

- The **CU Wellness Clinic** offers weight loss and wellness services, including physician-supervised wellness assessments and weight loss management, expert nutritional advising, psychological consultations, diagnostic testing, body composition testing, and measures of resting metabolic rate. To provide the safest and most effective care for our patients, we continue to offer both in person visits and virtual health appointment options. We are excited to announce that we are now offering Fibro Scan diagnostic testing for patients and research subjects. The Fibro Scan is an ultrasound device used to assess liver health without invasive tools. This assessment tool helps us diagnose fatty liver disease early, and it is ideal for those experiencing obesity and metabolic diseases such as pre-diabetes, diabetes, or metabolic syndrome. Shelby Sullivan, MD, from the Division of Gastroenterology provides advanced endoscopic treatments for obesity. Several other campus clinics housed within the Wellness Clinic complete a full range of care and services to the public. While COVID has had a significant impact on our clinical services, CU Wellness Clinic saw a slight increase in visit volume of 11% as compared to the previous year. The majority of our appointments are still conducted virtually but the flexibility of virtual appointments has helped with increased visit volume and reduced no show rates. More information about our services can be found on our website at <https://anschutzwellness.com/wellness-clinic> or by calling 303-724-9030.

Clinic Volumes	FY20	FY21	Percent variance
CU Wellness Clinic	5,267	5,842	11%
CU Wellness Clinic + Partners	17,139	27,266	59%

Virtual Visit Volume (FY 21)	In Person	Other (telehealth or phone)
CU Wellness Clinic	14%	86%

No Show Rate	Pre-COVID	COVID	Percent variance
CU Wellness Clinic	17.92%	12.89%	-28%

- The center offers a full spectrum of **Weight Loss Programs** (<https://anschutzwellness.com/weight-loss-2/>) Over the past year, we have had over 1100 participants in our programs. As of March 2020, all programs are offered virtually. These include:
 - ◊ **Weight Loss 4 Life**, (173 participants) bi-monthly ongoing support that gives participants the foundational tools and accountability needed to sustain weight loss long term.
 - ◊ **State of Slim**, (582 participants) a 16-week program focused on mindset transformation and improving metabolic health by following a structured diet and increasing activity.
 - ◊ **My New Weigh**, (363 participants) is a registered dietician nutritionist-led program utilizing behavior change and a highly structured meal plan for more significant weight loss for those who have not reached their weight loss goal with more traditional approaches.
- **Campus and Community Programs** strive to offer wellness programming to our partners that focus on the primary pillars of wellness at AHWC: physical activity, mental well-being, and healthy eating. Our metabolic and demonstration kitchens serve as the hub for much of our programming, along with a series of new virtual offerings in FY21. We focus on providing research-based, best practice programming to our partners with the help of our team of content experts at AHWC (including registered dietitians, psychologists, physical activity experts, etc.).

◇ **Caring for the Frontline:** This program is a half-day of wellness that focuses on our three pillars of wellness: nutrition, mental well-being, and physical activity. Attendees participate in sessions throughout the day that highlight each of these areas including a mindfulness session, restorative yoga, and a cooking demonstration. The content of this day is specifically curated for frontline workers and focuses on a day of self-care, restoration, and renewal. We work to provide a day focused primarily on their own wellness while also providing tools they can take with them and continue to implement in their daily lives. Our team focuses on the importance of self-compassion, taking time for yourself, and the importance of self-care especially while caring for others. We currently offer this program both in-person and virtually to teams of caregivers.

- 195 registered nurses participated in this program in FY21 including all Nurse Managers at UCH Hospital

⇒ Additional program participants also include Children's Hospital Colorado and CU Anschutz staff

- Currently offering this program to all 240 UCH Charge Nurses (estimated completion of November 2021)

◇ **Brain. Food. Recovery:** Together with the Marcus Institute for Brain Health (MIBH), this program includes a hands-on cooking program for MIBH patients with traumatic brain injuries along with a virtual session focusing on nutrition education. This program focuses on the importance of nutrition in healing and treatment of common symptoms they may be experiencing including but not limited to migraines and inflammation.

- Due to COVID restrictions, we offered this program in a limited capacity in FY21. We have resumed normal operations of this program for FY22.

◇ **CU Eat Well:** As all CU Anschutz students transitioned to remote learning, we too transitioned CU Eat Well to a virtual offering. The new format of this program offered curbside pick-up of ingredients, followed by a virtual cooking class taught by our registered dietitians. This format allowed us to greatly expand our participation numbers and served as an important place for students to connect with one another while being remote.

- Over 100 curbside meals provided to CU Anschutz students (FY21)
- We plan to continue to offer this program virtually in FY22, and with the support of campus partners plan to increase this offering to four times monthly to allow for greater student participation. It is currently offered twice monthly.

◇ **Lab Collaborative:** In partnership with the Graduate School, International Scholars, and the Postdoctoral Association, we started a new virtual cooking class offering specifically for members of these groups. The format is modeled on the CU Eat Well program, with the offering of curbside pick-up of ingredients followed by a virtual cooking class taught by a registered dietitian. We have seen significant success with this program and anticipate a continued partnership and growth in coming years.

- 75 participants in FY21

◇ **Culinary Medicine:** This is a weekly demonstration class conducted in collaboration with UCHHealth, Integrative Medicine, and community volunteers. We transitioned this program to a virtual setting in FY21 and saw a significant increase in participation numbers.

- 320 participants in FY21

◇ **Teaching Kitchen Collaborative:** Starting in January 2021, we joined the Teaching Kitchen Collaborative. This network has allowed us to learn from other experts around the country. We have had the opportunity to collaborate with other members to expand on best practices of our programs, share our successes and challenges, and continue to learn about new program ideas. More information on the Teaching Kitchen Collaborative can be found at <https://teachingkitchens.org/>.

- The center is home to the following Research groups: (\$9.8 million in annual funding secured. Numbers below represent direct and indirect funds)

◇ The **Colorado Nutrition Obesity Research Center (NORC)** (funded by NIH/NIDDK grant P30 DK048520, \$1.4 million annual) (<http://cunorc.org/>) has secured ~\$6 million through 2025 to promote interdisciplinary, translational research, and develop young investigators interested in nutrition and obesity research. The NORC research base includes 118 funded faculty members and 60 affiliated trainees, educators, and researchers, with a research portfolio of \$50 million of nutrition- and obesity-related research across five campuses in the Rocky Mountain Region. This portfolio includes over \$6 million in investigator-initiated research carried out in the AHC. The NORC supports three biomedical research cores (Clinical Intervention and Translation; Energy Balance Assessment; Molecular Cellular Analytic), and enrichment program, and a pilot/feasibility program for young investigators. This past year, the NORC leveraged an additional \$150,000 from NIH for pilot funding directed to researchers from underrepresented populations, with disabilities, or disadvantaged backgrounds.

◇ The **Clinical Trials Division** (\$1 million annual) conducts industry-sponsored research with a focus on nutrition. Areas of study include weight loss, weight maintenance, metabolic syndrome, and diabetes. The division specializes in behavioral approaches to weight loss, delivered through group classes and/or one-on-one counseling.

◇ **Look AHEAD** (\$600,000 annual) (Action for Health in Diabetes; funded by NIH/NIDDK grant U01 DK057151) funding was recently renewed through 2021. Look AHEAD is a multicenter, randomized clinical trial to examine the effects of a lifestyle intervention designed to achieve and maintain long-term weight loss.

◇ **Investigator-Initiated Research** (\$5 million annual) Our center faculty are engaged in investigator-initiated research studies funded by the NIH and other organizations. Many studies are focused on better understanding of body weight regulation and the treatment of obesity. Over the past year, new R01 grants were awarded to AHC-affiliated investigators including Vicki Catenacci, MD (R01 DK126814; Does When You Exercise Matter? A Randomized Trial Comparing the Effect of Morning versus Evening Aerobic Exercise on Weight Loss and Compensatory Behaviors), Kristen Nowak, PhD (R01DK129259; Daily Caloric Restriction in Overweight and Obese Adults with Autosomal Polycystic Kidney Disease), and Audrey Bergouignan, PhD (R01ADK123334; Breaking up sedentary behaviors to improve glucose control in a population at risk for developing type 2 diabetes).

◇ **Enhanced Lifestyles for Metabolic Syndrome (ELM)** (\$363,000 annual). Funded by the William G. McGowan Charitable Fund, this multisite randomized controlled trial spans 6 years (10/01/2018-07/31/2024) and examines two comparative lifestyle interventions for the long-term, sustained, remission of metabolic syndrome.

- The center is also working to establish a variety of disease-specific fitness and wellness programs.

◇ The **BfitBwell Cancer Exercise Program** (<https://anschutzwellness.com/bfitbwell/>) is the flagship of these programs. Having worked with over 600 cancer survivors since being established in 2013, it is a collaboration between the University of Colorado Cancer Center and the AHC. This program provides a three-month personalized exercise program to cancer survivors from the CU Cancer Center, consisting of individual and small group classes. The clinical program provides research data and infrastructure for cancer exercise research. Data from the program has led to three peer-reviewed publications in the last year and has been used in multiple NIH grant applications, including a resubmission of an R01 forming a collaboration with investigators in the NORC. The virtual capabilities developed during the COVID-19 pandemic are being integrated into the program to expand its reach to survivors outside the Denver Metro region and to those with difficulty traveling.

◇ Other disease specific programs include a program for patients deferred from kidney transplant due to physical deconditioning or obesity. A program for individuals who have undergone bariatric surgery is in development. Both programs will utilize the newly developed virtual capabilities practiced by the BfitBwell Program.

◇ A physical activity program will soon begin for patients going through the Center for Dependency, Addiction and Rehabilitation (CeDAR) program.

- The AHC is also home to several educational programs that support both clinical and research activities of the center.
 - ◇ Our **Obesity Medicine Fellowship Training Program** (<http://cunorc.org/obesity-medicine-fellowship/>) officially started on 7/1/2020 with support from a \$100,000 Obesity Medicine Fellowship Program Development Grant. This one-year clinical fellowship will lead to eligibility for the American Board of Obesity Medicine. During the past year we graduated our first fellow, Lisa Kisling Thompson, DO, MPH, who is leading the development of a cardiac prevention program at the Rocky Mountain Veterans Affairs Medical Center. Our second fellow, Gessa Suboc, MD, started 7/1/2021. She comes to the program after serving as the inpatient chief resident for the family medicine program at the University of Chicago (Northshore).
 - ◇ The center and affiliated researchers continue to support a T32 training grant from the National Institutes of Diabetes and Digestive and Kidney Diseases, (T32DK120521, 7/1/2020-6/30/2025) entitled: Training Program in Metabolism, Obesity and Type 2 Diabetes. AHC director Daniel Bessesen, MD, is the principal investigator on this grant, which supports two postdoctoral fellows for two years of research training. In this second year, this training grant will continue to support Maigen Bethea, PhD, from the University of Alabama at Birmingham, who is working with Darleen Sandoval, PhD, on role of the vagus nerve and the NTS in the effects of weight loss surgery, and Rebecca Keogh, PhD, from Ohio University, who continues to work with Kelly Doran, PhD, and Alexander Horswill, PhD, on the microbial pathogenesis of wounds in type 2 diabetes. This year we added support for two new fellows, Carmen Ortega received her PhD in Exercise and Nutritional Sciences from Arizona State University and will work with Audrey Bergouignan, PhD, on the molecular mechanisms underlying the benefits of short bouts of physical activity on carbohydrate metabolism and Andrew Libby who received his PhD in Integrative Physiology from the University of Colorado Anschutz, who will be working with Paul MacLean, PhD, on the effects of diet-induced weight loss and regular exercise on adipose tissue function in mice following ovariectomy. We applied for and received a diversity supplement to this training grant that will support David Ramirez who received his PhD in Bioengineering from the University of Colorado Boulder. He will work with Jane Reusch, MD, to do studies comparing microbubbles with intravital microscopy to assess skeletal muscle perfusion in individuals with type 2 diabetes.

AHC Mental Wellbeing Projects and Initiatives:

- **Clinical**
 - ⇒753 Psychotherapy sessions completed (100% telehealth). 13% increase in completed sessions over FY20 (661).
 - ⇒819 scheduled, 66 no-shows (8% no show rate)
- **Invited Presentations**
 - ⇒Practical Mindfulness for Stress: Finding Self Compassion Every Day
 - ⇒CU Alumni Happy + Healthy Hour
 - ⇒CU Advancement and CU Foundation “Game On” All Hands Retreat
 - ⇒CU Denver CFDA Faculty Lunch and Learn
 - ⇒CU Dental School Faculty Senate Meeting
- **Mindfulness Introduction**
 - ⇒CU Advancement Trustees Board Meeting Invocation
- **Programs – Community/Commercial**
 - ⇒Stress Eating Workshops (each were 4 consecutive Wednesdays, 60-minute virtual interactive workshops): 38 attendees
 - ⇒Caring for the Frontline: Practical Mindfulness for Helping Professionals
 - ⇒3 Virtual 60-minute interactive group sessions, 7 In-Person 60-minute interactive group sessions (adapted for COVID protocols)
 - ⇒Ongoing through FY22
 - ⇒8 In-Person facilitated by Clinical Psychology Post-Doctoral Fellow, Christy New PhD
 - ⇒Students/Learners: Practical Mindfulness for Helping Professionals: SOM Fellows, Dermatology Resident Retreat
 - ⇒6 Practical Mindfulness for Stress sessions with all Physical Therapy First Year Students (60-minute sessions, each approximately 12-15 participants)
 - ⇒State of Slim Weight Loss Program: 2 Bonus Stress Eating Workshops (60 minutes each) for Virtual Participants

- **Marketing/social media for Center**

⇒ *Mindful Mondays* brief 7-minute videos: <https://anschutzwellness.com/resources/>; <https://www.youtube.com/playlist?list=PLHMFkBBa7TImf19Xd6xMue8nJZ2AvSSpw>

⇒ FB/Twitter Mindfulness content for graphics: <https://www.facebook.com/AnschutzWell/photos>

⇒ Local news interviews (KDVR FOX31)

- **Research:** Elm Study, Virtual ELM Pilot with Rush University, Drift Study (Stress Eating mini workshops (2))

- **Campus Wellbeing initiatives**

⇒ The AHCWC has an Advisory Board whose membership includes Peter Buttrick, MD; Jean Kutner, MD, MPH; Stephen Daniels, MD, PhD; Richard Schulick, MD, MBA; C. Neill Epperson, MD; Ronald Sokol, MD; Venu Akuthota, MD; Wendy Kohrt, PhD; Tom Purcell, MD MBA; and Matt Vogl. This group has met once over the last year to advise the director of the AHCWC on the performance of the center, opportunities to be a more effective resource to the campus and what role to play in the overall wellness activities of the campus. With Tom Purcell leaving the University, Peter Kabos, MD, has agreed to be the Physician Champion for our BFitBWell cancer fitness/survivor program. Bessesen has maintained ongoing contact with Rachel Davis, MD; Elizabeth Harry, MD; and Katie Morrison, MD, who are leaders in the area of wellness on campus. We will continue to work with our Advisory Board and stakeholders on campus over the coming year.

⇒ Our goal is to make the AHCWC a campus resource in the areas of health and wellness. We will continue to use the resources of the center to promote nutrition, physical activity and mental wellbeing as pillars in supporting the wellbeing of students/trainees, faculty, patients, campus employees, research investigators, and the community surrounding the Anschutz Medical Campus. The COVID pandemic has reinforced the importance of wellbeing in the optimal functioning of our medical campus.

Barbara Davis Center for Diabetes

The Barbara Davis Center for Childhood Diabetes (BDC) is one of the largest centers in the world specializing in type 1 diabetes research and care for children and adults. Clinicians, clinical researchers, and basic biomedical scientists work at the BDC to find the most effective treatment, prevention, and cure for type 1 diabetes.

Clinical Care

The center provides state-of-the-art care for over 7,600 children and adults with diabetes. Barbara Davis Center clinics offer extensive education and support for patients and their families, as well as specialized programs such as the Pregnancy and Diabetes Clinic, the Hispanic/Latino Diabetes Care Program, and a model telehealth program. The Barbara Davis Center provides type 1 diabetes care for Children's Hospital Colorado diabetes and endocrine program, currently ranked No. 4 in the country by US News & World Report.

- BDC serves >90% of Colorado children diagnosed with type 1 diabetes.
- Patients from 46 out of 50 U.S. states receive care at the BDC.
- Patients from over 33 countries receive care at the BDC.
- 66% of pediatric patients use insulin pumps and 77% use continuous glucose monitors.
- >55% of adult patients use insulin pumps and 75% use continuous glucose monitors.
- BDC clinics accept >700 new patients annually.

Research

BDC research goals include investigation of the causes of type 1 diabetes, the early detection of autoimmunity, prevention, and early intervention. BDC clinical faculty members are developing new strategies and treatments for improved outcomes of care including prevention strategies for complications of both type 1 and type 2 diabetes. Investigators of the BDC were awarded >\$16.5 million in direct cost competitive funding in 2020 and published over 110 peer-reviewed papers in high-profile journals.

Clinical Research Highlights:

BDC investigators continue to increase the body of knowledge around the identification, cause, treatment, and outcomes of type 1 diabetes. Recent contributions include:

- BDC clinical trials pivotal for FDA approval of therapies and devices including: the first hybrid closed-loop system to automate insulin dosing; insulin FiAsp; nasal glucagon (Baqsimi); and Control IQ hybrid closed loop system for patients ≥ 14 yrs and for patients 6-13 yrs.
- Diabetic ketoacidosis at diagnosis of diabetes in children has increased to 59% (2017) and 68% during COVID-19 pandemic; it predicts poor diabetes control.
- SGLT adjunctive therapy improves outcomes in type 1 diabetes patients.
- Enteroviral infections predict islet autoimmunity.
- Autoimmunity Screening for Kids (ASK) study finds 1% of children in Denver have early type 1 diabetes and 2% have undiagnosed celiac disease.

Basic Science Research Highlights:

BDC was awarded the highly competitive NIH P30 Diabetes Research Center (2020), providing core resources, enrichment programs and pilot & feasibility grants to integrate and foster interdisciplinary cooperation of investigators conducting research in diabetes and related areas of endocrinology and metabolism.

BDC contributions to several high-profile studies that focused on the pancreatic islet in type 1 diabetes include:

- Determination that methyl dopa blocks the diabetes-specific activation of HLA-DQ8 molecules.
- The contribution of RNA processing in regulating islet function in type 1 diabetes.
- The modification of insulin B-chain fragments create superagonists for T cells in type 1 diabetes.
- Novel techniques to promote maturation and functionality of human stem cell-derived beta cells.
- Modulation of type 1 diabetes progression using CAR T cells targeting a pathogenic MHC Class II peptide complex.
- In vitro generation of thymic epithelial cells to begin to model type 1 diabetes autoimmunity in a dish.
- Utilizing novel technologies to identify new biomarkers for earlier prediction of type 1 diabetes.

Leadership: BDC investigators sit on planning and leadership committees for organizations including the American Diabetes Association, the American Heart Association, International Society for Pediatric and Adolescent Diabetes, Keystone Research Symposia, nPOD and the T1D Exchange Clinic Registry.

Service Centers

The BDC Research Division provides cytometry and islet preparation services for diabetes researchers across CU. The molecular biology service center provides basic molecular biology support, DNA sequencing, cell line authentication and mycoplasma testing. In 2019, BDC established the microscopy program providing access to equipment and expertise for better visualizing the tissues affected in type 1 diabetes. In 2021, BDC also participated in the establishment of a new human organoid core to facilitate the study of how human tissues are affected in type 1 diabetes. The CAP & CLIA certified autoantibody/HLA service center performs studies which include assays for islet autoantibodies and markers of other autoimmune disorders, including celiac and Addison's disease. This laboratory serves as the core laboratory for numerous national and international trials for the prevention of type 1 diabetes.

Education

The BDC provides an outstanding training environment for developing physician-scientists, clinicians, and basic science researchers. Faculty members provide laboratory and clinical research training opportunities for young investigators from around the world including participants in the highly successful T32 Pediatric Endocrinology Fellowship Training Program, K12 Pediatric Endocrinologist Career Development Program, and a newly established T32 Interdisciplinary Bioengineering Research Training in Diabetes. The annual Keystone Conference remains the center's flagship in the area of continuing medical education in management of diabetes, regularly selling out with over 600 participants.

Website: www.barbaradaviscenter.org

The Barbara Davis Center is led by **Marian Rewers, MD, PhD**, executive director; **Paul Wadwa, MD**, director of pediatric diabetes division; **Satish Garg, MD**, director of adult diabetes division; **Lori Sussel, PhD**, director of basic and translational research division; and **Janet Snell-Bergeon, PhD**, director of clinical epidemiology division.

Cardiovascular Institute

The University of Colorado Cardiovascular Institute is co-directed by **Peter M. Buttrick, MD**, and **Leslie Leinwand, PhD**, with a focus on the integration of cardiovascular research, treatment, and discovery through a collaboration of the University of Colorado Anschutz Medical Campus and the University of Colorado Boulder. **Michael R. Bristow MD, PhD**, is the director of the pharmacogenomics section and **Matthew R.G. Taylor MD, PhD**, and **Luisa Mestroni, MD**, are co-directors of the molecular genetics section. **Timothy A. McKinsey, PhD**, provides leadership in both sections.

The scientific goals of the institute are to understand the genetic basis and specific molecular mechanisms responsible for heart muscle disease and heart failure, and to produce new diagnostic techniques and treatments for patients. By integrating the effort of those committed to curing heart muscle disease and heart failure, the collaborative nature of the institute encourages sharing findings and data, which translates into improved diagnosis and therapies for patients.

In molecular genetics, our mission is to investigate and identify causes of heart muscle disease and heart failure; in pharmacogenomics, our mission is to 1) investigate and identify pathologic gene expression responsible for heart muscle disease and heart failure, and 2) identify and develop therapies that favorably affect pathologic myocardial gene expression or the clinically important consequences of variant gene products.

In the past year, Cardiovascular Institute sections and members have published over 50 peer-reviewed papers, submitted three patents, secured over 15 funding awards (with another 20 funding awards in process), and garnered several academic honors.

<https://medschool.cuanschutz.edu/cardiovascularinstitute>

Center for Bioengineering

Leadership

Robin Shandas, PhD, Distinguished Professor and Founding Chair, Department of Bioengineering
University of Colorado Denver | Anschutz Medical Campus
Professor of Pediatrics (cardiology) and Surgery
Director, Center for Bioengineering
University of Colorado School of Medicine

Mission

The Center for Bioengineering aims to support, catalyze and grow research, training and entrepreneurship at the intersection of clinical medicine and engineering on the Anschutz Medical Campus.

Website address

<https://medschool.cuanschutz.edu/bioengineering>

Accomplishments

New Faculty

Chelsea Magin, PhD, has been appointed as assistant professor in the Department of Bioengineering. Magin also holds joint appointments in pediatrics and medicine. She received the 2019 Colorado Bioscience Association Educator of the Year Award recognizing her excellence in teaching, mentorship, and outreach. This year, Magin has been awarded an NSF Faculty Early Career Development (CAREER) Program Award and an R01 from the NIH/NHLBI for her work in in vitro models of pulmonary fibrosis. Magin runs the Bioinspired Pulmonary Engineering Lab and her team hopes to use their models to identify new life-saving treatments for future use in patients.

Peña-Castellanos, PhD has been appointed as assistant research professor in the Department of Bioengineering with a joint appointment in the Department of Medicine Division of Cardiology. Peña has been involved as an instructor and mentor with the Department of Bioengineering since 2017, teaching graduate and undergraduate curriculum. Peña recently was awarded a K25 grant and will move part of her lab into Bioscience 3, where her research will focus on testing to find the most efficient method to deliver regenerative miRNAs for cardiac tissue engineering.

Brecca Gaffney, PhD, and Mazen Al Borno, PhD, were recently hired through a collaborative search with the College of Engineering, Computing and Design at CU Denver. Gaffney has a primary appointment in Mechanical Engineering and Al Borno is rostered through Computer Science and Engineering; both are members of the Center for Bioengineering, have lab space in Bioscience 3, and are actively developing collaborations across the School of Medicine and Anschutz Medical Campus. Gaffney's research focuses on biomechanics, and how movement compensations impact the musculoskeletal system, specifically regarding the development of pain conditions. Al Borno's research focuses on using computer simulations to understand how the brain generates movement and in developing wearable technology to help people with movement disorders achieve a better quality of life.

Awards

Odalis Castro, bioengineering student, received a Fullbright Fellowship to conduct skin cancer research in Krakow, Poland. Sean Hansen, bioengineering student, received the Colorado Engineering Council Silver Medal for outstanding academic accomplishments in Engineering.

Vira Kravets, PhD, a postdoctoral fellow in bioengineering, received the "Emerging Leaders in Type 1 Diabetes" award.

Duncan Davis-Hall, PhD student in bioengineering, received an F31 predoctoral grant from the National Heart, Lung, and Blood Institute to bioprint three-dimensional mimics of lung blood vessels.

Richard Benninger, PhD, associate professor of bioengineering, received an NIH T32 training grant to support research training at the intersection of bioengineering and diabetes.

Bradford Smith, PhD, assistant professor of bioengineering, received a \$2.8 million R01 award from the NIH National Institute of Heart, Lung, and Blood to establish diagnostic algorithms and computer-controlled mechanical ventilation systems to improve mechanical ventilation safety.

Description

The Center for Bioengineering and the Department of Bioengineering represent the research and academic components of the bioengineering program at the University of Colorado Denver | Anschutz Medical Campus. Built to improve patient care by fully integrating engineering principles of design with biological systems and biomedical technologies, the program continues to expand. Over \$33 million in new grant funding was generated last year by center faculty. More than 100 CU Anschutz, Denver, and Boulder faculty have affiliations with the Center for Bioengineering.

The Department of Bioengineering in the College of Engineering, Design and Computing employs 10 tenure-track and 25 non-tenure track bioengineering teaching and research faculty that deliver both graduate and undergraduate degree programs. The majority of this instruction occurs on the Anschutz Medical Campus, also home of the Bioengineering Opportunities and Leadership Training (B.O.L.T.), focused on introducing high school and middle school students to bioengineering, and the BioEngineering Empowerment Program (B.E.E.P.), focused on expanding opportunities for underrepresented students in bioengineering and related STEM disciplines.

Bioscience 2, in the Fitzsimons Innovation Community adjacent to the Anschutz Medical Campus, is the primary location for the academic programs, where bioengineering students learn how to apply engineering skills and knowledge to solve clinical problems. Opportunities for research and innovation in medical technology were recently enhanced through the opening of Bioscience 3, which houses new research labs, the Center for Inclusive Design and Engineering (CIDE), and design innovation studios to incubate new medical technologies.

Funded research projects include studies that use cardiac cells to repair congenital heart defects; studies in ventilator-induced lung injury in pediatric patients; projects in disability and aging; projects in neuro-optics and prosthetics; and research in thrombosis and homeostasis. Research in the Center for Bioengineering is carried out in research space in Bioscience 2 and Bioscience 3. Additional research space is utilized on the downtown campus by the CIDE as well as in the Barbara Davis Center, Research 1 North, Research 2, and the Research Institute at the Children's Hospital Colorado.

Robin Shandas, PhD, is the director of the Center for Bioengineering and chair of the Department of Bioengineering. Faculty membership is representative of the diverse and translational research projects that bridge engineering and medicine, and our program collaborates with more than 100 faculty in the CU School of Medicine. The Center for Bioengineering has active research collaborations with the Colorado Translational Research Imaging Center, the neuroscience program, the Barbara Davis Center for Diabetes, Data Science to Patient Value, the Division of Pulmonary Sciences and Critical Care Medicine, the Ludeman Family Center for Women's Health Research, Gates Center for Regenerative Medicine, Hemophilia and Thrombosis Center, Center for Cancer and Blood Disorders, Developmental and Behavioral Biology, Orthopedics, Geriatrics, Physical Medicine and Rehabilitation, the Linda Crnic Institute, the Clinical Translational Research Center, Organoid and Tissue Modeling program and the iPSC Core at the CU School of Medicine.

Faculty in bioengineering have active collaborations with the Heart Institute, the Breathing Institute, the Gait Lab, the Cardiovascular Pulmonary Research Lab, the Pediatric Heart-Lung Center, the Colorado Fetal Care Center, and the Single Ventricle Care Program at Children's Hospital Colorado. Faculty have active collaborations with the VA medical center, National Jewish Health, CU Boulder, Colorado State University, and Colorado School of Mines. The Department of Bioengineering and the Center for Bioengineering also collaborates with the Colorado Bioscience Institute as well as with many local industry partners, including Medtronic, Securisyn, EndoShape, Inc., EnteroTrack, LLC, Stryker, AlloSource, Inc., Couragion Corporation, mindSpark Learning and Aurora Public Schools, Sharklet Technologies, Inc., Point Designs, National Seating and Mobility, NuMotion, BenchMark Advanced Manufacturing, and Google.

The center features strong and successful programs in medical device innovation and entrepreneurship. Faculty and students have started 12 companies over the last 11 years, several in collaboration with School of Medicine faculty. Several technologies have been invented at the center and over 110 patents or patent applications have been generated over the last 11 years.

Center for Children's Surgery

The Center for Children's Surgery (CCS), a multi-disciplinary center housed within the School of Medicine, was established in 2011 to represent faculty who specialize in providing surgical care to children. The CCS is promotes the continued growth and development of CCS members to fulfill the multiple missions of the School of Medicine and the Children's Hospital Colorado (CHCO). The center's continued focus on strengthening and deepening the partnership and synergies between these two entities will remain an important factor in supporting the advancement of the Anschutz Medical Campus.

CCS leadership includes **Duncan Wilcox, MBBS, MD**, director and surgeon-in-chief at Children's Hospital Colorado, **Michael Handler, MD, FACS, FAAP**, associate surgeon-in-chief, **Thomas Inge, MD, PhD**, associate surgeon-in-chief for research, **Cindy Barrett, MD, MPH**, medical director for surgical quality and safety, and **Sandra Talley, MPH**, director of finance and administration. The CCS is comprised of the following pediatric divisions/sections: adolescent and pediatric gynecology, pediatric cardiothoracic surgery, pediatric neurosurgery, pediatric ophthalmology, pediatric orthopedics, pediatric otolaryngology, pediatric surgery, pediatric plastic surgery, pediatric urology, pediatric transplant surgery, and pediatric dermatology.

The past year saw significant progress on CCS goals, including the appointment of **Jill Kaar, PHD** as the director of our research outcomes in children's surgery (ROCS) team and adding a quality-and safety-focused pilot grant program. In the coming year, the CCS will focus on continuing to develop our quality and safety program, publishing outcomes on our website, applying for ACS verification, investing in and supporting new pediatric section leaders, as well as implementing a mentorship program for advanced practice providers.

<https://medschool.cuanschutz.edu/ccs>

<https://www.childrenscolorado.org/doctors-and-departments/departments/surgery/>

Center for Health Artificial Intelligence

The Center for Health Artificial Intelligence (AI) fosters a thriving community of researchers on the Anschutz Medical Campus who are inventing and deploying advanced analytical approaches. The center mission is to make the Anschutz Medical Campus a leader in translating data into advances in research practice, health care delivery, and population health, and scaling these to provide nationwide benefit through innovative technologies. In its launch phase, the center is laying the groundwork for inclusive, supportive, and collaborative communities of practice and center membership; leading the recruitment of faculty with research programs in advanced analytical methods; and addressing gaps in computational infrastructure.

Founded in 2020, the Center for Health AI (CHAI) is led by Director **Casey Greene, PhD**; Director of Finance and Administration **Audrey Wen, MS**; and Deputy Director **Sean Davis, MD, PhD**. Faculty advisors guiding the center during its launch phase include Melissa Haendel, PhD, Lawrence Hunter, PhD, and Tell Bennett, MD, MS. These faculty, who currently comprise the center, have submitted grant applications totaling more than \$260 million since its founding in November 2020 and are supported by more than \$20 million in active extramural funding.

Center faculty and their research programs have been featured in articles of science journalism since November. Hunter shared his expertise with *Nature Methods* on the topic of [quantum computing in biology](#). Work from the Greene lab using AI to examine disparities between the authorship of research manuscripts and quotes in pieces of science journalism was [covered by Physics Today](#) and addressed in [an editorial in Nature](#). The National COVID Cohort Collaborative (N3C), created as a team science project with leadership from Haendel and Bennett, was [highlighted by MIT Technology Review](#) as the leading example of a national infrastructure for medical records.

Over the next year, the center will shift its focus from laying the foundations for success to enhancing and integrating analytics-focused communities on campus across the translational spectrum from bioinformatics to clinical implementation. This effort will include recruitment of faculty in partnership with departments, the development of a membership program for faculty and trainees, and the development of an annual symposium with an external keynote speaker. The center will seek to enhance education and training opportunities focused on data intensive research, in part through leveraging the [Orchestra training platform developed by center faculty](#). The center will work to establish partnerships with key stakeholders on the Anschutz Medical Campus and in the broader University of Colorado system including academic departments, communities, and operational units focused on information technology. The center will move into the new Anschutz Health Sciences Building during the next year, which will put the center in proximity with teams from the Colorado Center for Personalized Medicine, the Colorado Clinical and Translational Sciences Institute, and the Adult and Child Consortium for Health Outcomes Research and Delivery Science, and other data-intensive research programs. We will continue to invest in our ability to bring NIH funding to the campus by establishing the processes, expertise, and infrastructure required for highly competitive data-intensive research programs. We look forward to continuing to grow the center's research programs and impact on the Anschutz Medical Campus in the years ahead.

Center Website: <https://medschool.cuanschutz.edu/ai>

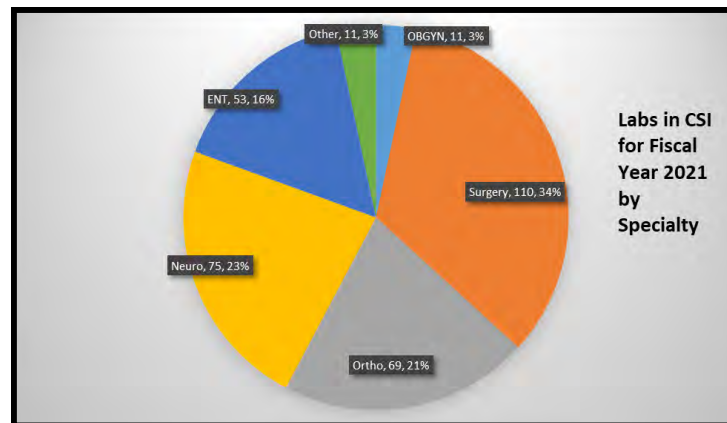
Center for Surgical Innovation

The Center for Surgical Innovation's (CSI) mission is to provide cutting-edge surgical training courses aimed to train medical affiliates in the latest surgical techniques and technology locally, regionally, nationally, and globally, and to study surgical and procedural educational methods to advance how surgical procedures are learned and taught.

CSI was created in 2007 and is supported and overseen by five surgical departments on the University of Colorado Anschutz Medical Campus. The participating departments are surgery, neurosurgery, orthopedics, obstetrics/gynecology, and otolaryngology.

The CSI leadership team is **Thomas Robinson, MD**, medical director; **Sarah Massena, MBA**, business director; **Alexandra Hay, BS**, lab manager; two lab coordinators and two lab techs.

CSI moved into their new lab in Bioscience 3, 2115 N. Scranton St., Suite 1035. The new state-of-the-art facility has multiple conference rooms and a larger lab with over 8,000 square feet of space.



Colorado Sickle Cell Treatment and Research Center

The Colorado Sickle Cell Treatment and Research Center, established over 45 years ago, is the region's primary source of specialty expertise and facilitation of comprehensive specialty care for children and adults living with hemoglobinopathies. Basic, clinical, and health services research conducted by the center and its collaborators serves to elucidate the pathophysiology of sickle cell disease, develop and implement treatments and systems of care that prevent or minimize complications and that prolong and improve the quality of life, are supported by funding from the National Institutes of Health and other federal agencies, industry, and foundations.

The center holds a longstanding contract with the Colorado Department of Public Health and Environment to coordinate short-term follow-up of newborn screening for sickle cell disease. The staff continue to assist the Department of Public Health and Environment laboratory as it expands its newborn screening testing services.

Direct patient care is provided by our Director **Kathryn Hassell, MD**, for adults at UHealth University of Colorado Hospital and by Associate Director **Rachelle Nuss, MD**, for pediatric patients at Children's Hospital Colorado (CHCO).

Funding awarded annually to the center since FY2019 from state Medicaid surplus funds helps support our sickle cell providers as they promote health systems changes to improve the quality of care for this underserved population. A transition program, directed by a full-time transition coordinator, targets 12- to 26-year-olds to facilitate self-advocacy and health system navigation skills as youth move from pediatric to adult health care throughout Colorado. Leveraging this expertise, center staff contribute to the development of an institutional transition program for all patients at CHCO.

The center also organizes a state plan for sickle cell disease, with funding from the Pacific Sickle Cell Regional Collaborative, part of a national Health Resources and Services Administration program. This state plan enhances communication and education for providers across Colorado, facilitates collaboration between health care systems and insurers, and disseminates care guidelines, major research advances and awareness of available resources to all stakeholders including patients and their families. An expanded website encompasses this information and serves as a statewide resource and point of contact. For more information about the center, please visit: www.coloradosicklecell.org or <https://medschool.cuanschutz.edu/sickle-cell-center>.

Gates Center for Regenerative Medicine

The Gates Center for Regenerative Medicine was established in 2006 with a generous gift in the memory of business entrepreneur and philanthropist Charles C. Gates. Under the direction of Dennis Roop, PhD, the Gates Center's mission is to bring together and support researchers and clinicians in stem cell biology and regenerative medicine to accelerate discoveries from the lab through clinical trials to therapies and cures. The Gates Center works across the Anschutz Medical Campus and with many research partners, bringing together and fostering research and clinical talent, regulatory and intellectual property expertise, commercial partners, and diverse funding. Facilities and benefits for our 124 medical research and clinician members, who are from the Anschutz Medical Campus, CU Boulder, CU Denver, Colorado State University, Colorado School of Mines and National Jewish, and private industry, include: core labs, patent-pending cell production platforms, the best-in-class Good Manufacturing Practice (GMP) production center at the Gates Biomanufacturing Facility, business development and commercial guidance, and affiliation with undergraduate and graduate education programs.

COLLABORATION AND RESEARCH

- The Gates Center negotiated discount access for its members to two core facilities on the Anschutz Medical Campus: The Genomics Core and the Human Immune Monitoring Shared Resource. The Gates Center is pleased to be able to leverage existing infrastructure so that members have subsidized access to existing cutting-edge equipment and technology in addition to those available in other Gates Center subsidized cores, including the Flow Cytometry Core, the Histology (Morphology and Phenotyping) Core, the Organoid Core, and the Stem Cell Biobank and Disease Modeling Core.
- The Gates Center's Stem Cell Biobank and Disease Modeling Core was established in 2017 and uses Gates Center members Ganna Bilousova, PhD, and Igor Kogut, PhD's safe and efficient reprogramming technology (reported in Nature Communications in February 2017) to generate banks of induced pluripotent stem cells (iPSCs) as a platform. It then employs the iPSCs as tools to understand the underlying basis of diseases that affect tissues that cannot be easily biopsied, such as the brain.

This core continues to provide services for numerous clients on the Anschutz Medical Campus and at CU Boulder, as well as for national and international external clients. Additionally, the core works on several projects that have been initiated and generously underwritten by community benefactors. These include using iPSCs to determine the underlying causes and specific treatments of neurological diseases such as epilepsy, as well as the ongoing research program for the Ehlers-Danlos Syndrome (EDS) Center of Excellence to determine the genetic basis of EDS and develop a cell-based therapy.

GOOD MANUFACTURING PRACTICE FACILITY

The Gates Center's affiliated, state-of-the-art Gates Biomanufacturing Facility (GBF) remains key to the facility's mission of translating innovative research discoveries into safe and effective cell therapy and protein biologic products for human clinical trials. During 2021, it served on- and off-campus researchers and remained both GMP-compliant and busy working with outside companies during the campus shutdown. Significantly, in 2021 the Gates Biomanufacturing Facility in collaboration with the CU Anschutz campus reached the following milestones:

- Manufactured cancer-fighting chimeric antigen receptor T cells (CAR T cells) developed by faculty in the CU School of Medicine;
- Launched a clinical trial at UHealth University of Colorado Hospital and Children's Hospital Colorado; and
- Enrolled patients who had no other viable therapeutic options.

This UCD19 CAR T trial conducted over the last year represented the first cellular immunotherapy project in which the developmental science, the regulatory filing and approvals, the manufacturing process, and the infusion of adult and pediatric patients in clinical trials had all been completed at the Anschutz Medical Campus. This made the campus one of the few academic medical campuses in the country where such bench science can move to manufacturing to patient treatment within walking distance.

BUSINESS DEVELOPMENT AND COMMERCIALIZATION

- In fall 2020, the Gates Center and CU Innovations worked with its Gates Grubstake Fund's Scientific Investment Advisory Committee to make three awards of \$350,000 toward the translational development of promising regenerative medicine projects into patented, clinic-ready products for patients in need. Awardees included Ulli Bayer, PhD, Eduardo Davila, PhD, and Michael Zuscik, PhD. Additionally, previous Grubstake Fund awardees Ken Liechty, MD, Holger Russ, PhD, and David Wagner, PhD, received "Second Tranche Funding" designed to further existing projects. Finally in February 2021, David Wagner, PhD, became the first Gates Grubstake Fund recipient to achieve the goal of this Grubstake funding: launching a first-in-human clinical trial with a drug he designed to benefit patients suffering from type 1 diabetes, with applications for multiple sclerosis and other conditions. Since 2014 when the Gates Center launched the Gates Grubstake Fund, 21 Grubstake awards totaling an investment of \$6.2 million have been directed towards scientists with promising research discoveries to accelerate the development of viable products and technologies for human benefit. To date, Grubstake awardees have received \$35.5 million in follow-on funding.
- Another Gates Center commercialization program, called Startup Toolbox, helps fund business assistance resources and has funded nearly 20 projects since its creation in 2018. Between the Gates Grubstake Fund and Startup Toolbox, five startups have been created, more than 10 SBIR/STTRs have been received with subawards to the University, ten pre-IND/IND/IDEs are in prep or filed, one clinical trial has started, and over \$35 million has been received in follow-on funding.

EDUCATION AND OUTREACH

- In the summer of 2021, the Gates Center sponsored the seventh year of the Gates Summer Internship Program (GSIP) that places highly qualified undergraduate students from across the country in center members' labs to encourage them to incorporate regenerative medicine into their career plans. Following the summer 2020, during which the program operated virtually due to COVID, GSIP accepted 25 students out of over 150 applicants for the on-campus 2021 program, including 14 students from the Class of 2020. Data collected in a fall 2020 project to assess the impact of the first six years of the program demonstrated GSIP's overall success. As of June 2021, 127 student interns from 68 colleges and universities have been beneficiaries of this program, and the majority have proceeded to pursue academic or professional paths in science and medicine with at least 16 GSIP alumni working on the Anschutz Medical Campus as students or employees. Significantly, the program has also enabled the Gates Center to place interns in members' labs at no charge, providing a valuable boost to their research portfolios.

- The center continued to support the Graduate Program in Cell Biology, Stem Cells and Development (CSD) to help attract and train candidates in the regenerative medicine field.
- Despite COVID, the Gates Center held virtual meetings, events, and its seminar series throughout the year to maintain and broaden the center’s reach.

GRANTS AND FUNDRAISING

- As of the end of calendar year 2020, the center and its members had received over \$233 million in peer-reviewed funding from the National Institutes of Health, the U.S. Department of Defense, and other foundations.
- Private philanthropy is an increasingly vital driver of innovative research and education initiatives at the Gates Center. In 2020, generous gifts were directed toward the Director’s Innovation Fund in support of research and other projects, the Gates Summer Internship Program for college undergraduates, the iPSC Discovery Platform Fund to employ induced pluripotent stem cells to study a variety of diseases, and the Startup Toolbox Fund to provide center members with business resources to move discoveries to cures.

SENIOR PROGRAM LEADERSHIP

Dennis R. Roop, PhD, Director

Mark Petrash, PhD, Associate Director

Joseph Brzezinski, PhD, Gates Summer Internship Program Co-Director

Heather Callahan, PhD, JD, EMBA, Gates Center Entrepreneur in Residence

Jill Cowperthwaite, Director of Marketing and External Relations; Gates Summer Internship Program Co-Director

Carmen Garcia, MBA, Research Administrative Manager

Matthew Seefeldt, PhD, Gates Biomanufacturing Facility

Michael Tortoro, Philanthropy

<https://medschool.cuanschutz.edu/gates-center-for-regenerative-medicine>

Helen and Arthur E. Johnson Depression Center

The mission of the Helen and Arthur E. Johnson Depression Center (JDC) is to improve the lives of people with depression, bipolar, anxiety, and related disorders through clinical excellence, innovative care models, community engagement, research, and workforce development.

The three primary goals of the JDC are to

- Promote mental health as key to healthy living for all Coloradans;
- Develop, provide, and disseminate effective care for people with depression and bipolar disorder; and
- Eliminate barriers to quality care and healthy communities.

www.coloradodepressioncenter.org

The JDC, in partnership with the Cohen Veterans Network, opened the Steven A. Cohen Military Family Clinic at the University of Colorado Anschutz Medical Campus (Cohen-AMC) in April 2018.

www.coloradodepressioncenter.org/mfc

As of January 1, 2021, the JDC is part of the Department of Psychiatry.

Clinical Excellence and Innovative Care Models. The JDC clinicians form a multi-disciplinary team of therapists and psychiatric providers delivering care to patients across the lifespan and family system. The center has deep expertise providing services to individuals with mood and related disorders, developing and implementing integrated care models, both in-person and virtually, and understanding other technology-based solutions. The JDC completed over 10,000 patient visits during the past year, and close to 70,000 since 2009. The JDC has led telehealth efforts locally and nationally through practice innovations, training and education, and guideline development. This background in telehealth operations facilitated the rapid transition to 100% virtual care beginning March 16, 2020. Since that time, the JDC has seen an increase in demand for services and a decrease in no-show rates to as low as 5%.

The JDC continues to provide administrative oversight of the Cohen-AMC, which provides targeted, evidence-based outpatient mental health care to post-9/11 Veterans and their families regardless of discharge status or military role. The Cohen-AMC began seeing active duty service members this year. The clinic provided over 3,500 clinical services, all virtually, this year, and over 7,000 services since opening.

Innovative Research. The center conducts research for the purpose of improving the identification and treatment of depression, bipolar, anxiety and related disorders, preventing suicide, and developing sustainable integrated care models. Center faculty are committed to developing best practice solutions for care delivery. The clinic is uniquely positioned to evaluate implementation of these solutions. JDC research activities focus on the interactions between basic science, innovated care models, and standard of care practices.

As a charter member of the National Network of Depression Centers (NNDC), the JDC partners with world-renowned academics and clinicians to better understand and treat mood disorders including the Mood Outcomes Program, which is a patient registry of mood, anxiety, and suicidality ratings. The JDC continues to evaluate the benefits of integrated care delivery systems and provides nationwide leadership by disseminating integrative care best practices. JDC faculty serve as leads for several NNDC task groups.

Community Engagement. The JDC's community and education programs are designed to extend the reach of the center to communities across the state and nationally through diverse educational offerings to increase understanding of depression, bipolar, anxiety, and related disorders, reduce stigma, prevent suicide, and increase access to quality mental health care. Educational offerings are delivered to communities, in schools, businesses, and to professional groups including first responders, health care professionals, and university faculty, staff, and students.

The JDC community and education programs director has trained, often at no cost, over 25,000 individuals since September 2016. Over 10,000 individuals were trained during the past year and the JDC saw the average number of trainings per month increase from 10 to 16, and the average number of participants per training increase from 29 to 60. JDC faculty also have led community events in topics such as mindfulness, teen anxiety, deciphering teen behavior, school anxiety, resiliency, social media and suicide, and now offer mental health first aid training. Workplace trainings have been an increased emphasis with almost 40% of all trainings now occurring in work settings. The Cohen-AMC began conducting community-based training in 2020, with a focus on Mental Health First Aid.

Workforce Development. The JDC has provided mini-rotation supervision for social work and psychology graduate students and psychiatry residents interested in delivering outpatient mental health services, integrated care, and community programs. Cohen-AMC has also provided development opportunities to students interested in gaining experience with Military and Veteran communities.

LEADERSHIP TEAM:

Neill Epperson, MD, Executive Director

Matt Mishkind, PhD, Deputy Director

Christopher Schneck, MD, Medical Director

Melissa Sinclair, CPC, MA, Director of Finance and Administration

Alex Weber, MA, Director of Education and Community Programs

Azure Brame, Clinic Manager

Marcus Palas, Philanthropic Advisor

Courtney Hughes, Board of Directors Chair

Kammy Bishop, LPC, Cohen Clinic Director

Hemophilia and Thrombosis Center

The University of Colorado Hemophilia and Thrombosis Center (HTC) is one of 142 centers for the comprehensive treatment of bleeding and clotting disorders recognized by the United States Department of Health and Human Services, Maternal Child Health Bureau. Serving nearly 2,000 pediatric and adult patients in Colorado, Wyoming, Montana, and surrounding states, the HTC operates a freestanding School of Medicine outpatient clinic specializing in inherited bleeding and clotting disorders, hemorrhagic stroke, ischemic stroke, or fetal brain injury, and women's bleeding disorders.

Led by co-directors Marilyn Manco-Johnson, MD, and Michael Wang, MD, the center has been on the forefront of development and adoption of a comprehensive care model for patients with inherited bleeding disorders and the prophylactic use of factor replacement products for the treatment of hemophilia, transforming bleeding disorders patients' lives around the world. Manco-Johnson received a Lifetime Achievement Award in 2021 from the National Hemophilia Foundation for her contributions to the field. Wang is widely recognized as an expert in the field of clinical trials for new therapies. Following their leadership, HTC hematologists and pharmacists, in partnership with patients, are in the vanguard of novel treatments through participation in clinical trials for new therapies. This commitment to the future directly impacts the health and well-being of targeted patient populations. As a result, patients have experienced improved outcomes, more convenient administration, and lower total cost of care.

Through the operation of the HTC Pharmacy providing therapeutic drugs to its patients, the center is financially self-sustaining. During the 2021 fiscal year, the pharmacy was accredited by the Accreditation Commission for Health Care. This accreditation joins the pharmacy's Utilization Review Accreditation Commission (URAC) accreditation as recognition of the pharmacy's commitment to excellence. The center operates the pharmacy and its multi-disciplinary clinics on the University of Colorado Anschutz Medical Campus in collaboration with Children's Hospital Colorado and University of Colorado Hospital. In addition, the HTC conducts remote clinics in Colorado Springs and Grand Junction, and in Billings and Missoula, Montana.

The COVID-19 pandemic, which dominated the School of Medicine's attention during the fiscal year, presented many challenges to the center's comprehensive care model and its mission to conduct research in search of novel treatments for congenital bleeding and clotting disorders. At the same time, it served to highlight staff nimbleness, adaptability, resilience, and commitment to our patients as center health care providers quickly pivoted the comprehensive care model to regional telehealth. HTC Providers are now licensed to practice medicine in nine states as part of the effort to provide care via telehealth. While the HTC clinical and pharmacy teams continued working on site to ensure uninterrupted access to needed therapeutics, the bulk of the center's administrative and research staff learned to work remotely.

In 2021, the center embarked on a major expansion of its clinical facilities, adding 10,000 square feet to its clinical operations and an additional 4,000 square feet to clinical administration. The renovation/expansion will include a state-of-the-art laboratory for the study of gait and bleeding-related arthropathies in patients and the creation of individualized therapeutic regimens in the pursuit of precision medicine in collaboration with center physical therapists.

HTC patient care is delivered by multidisciplinary, physician-led teams, including, hematologists (doctors who specialize in blood), neurologists, neurosurgeons, gynecologists, orthopedists (doctors who specialize in bones, joints, and muscles), physiatrists (doctors who specialize in rehabilitation and a return to function), advanced practice providers, physical therapists, pharmacists, psychologists, genetic counselors, nurses, social workers and other mental health professionals, lab medical technologists and pathologists, and other specialists by referral, (e.g., dentist, nutritionist). With a staff of 60 full and part time professionals, including both clinical and lab research physicians, the HTC actively pursues both industry-sponsored and investigator-initiated research in bleeding and clotting disorders. Current research is centered on rare genetic causes of bleeding and clotting, the physiology of Von Willebrand Factor (particularly the regulated release of VWF from the endothelium), platelet function, pain management, and joint biomechanics. Center researchers conduct clinical trials employing new treatment options in collaboration with international pharmaceutical companies. HTC clinical researchers collaborate with bleeding disorder centers around the globe, producing research and results that impact patients worldwide.

HTC Academic Accomplishments

1. Grants

HTC investigators were successful in securing external research funding during the 2020-2021 academic year.

- Beth Warren, MD, was awarded an NIH K23 award to study joint biomechanics.
- Pavel Davizon-Castillo, MD, was awarded an NIH K99 award to study platelet function.
- Tyler Buckner, MD, continued in his NIH K23 award to study pain in hemophilia.
- Christopher Ng, MD, continued his research into Von Willebrand Factor with a grant from Versiti (formerly Blood Works Wisconsin).

2. Service to the Academic Community

- Tyler Buckner, MD, serves on the Medical and Scientific Advisory Council of the National Hemophilia Foundation.
- Michael Wang, MD, serves as chair of the Gene Therapy Work Stream of the Council for the Hemophilia Community.
- Timothy Bernard, MD, serves as Vice Chair of the International Pediatric Stroke Study Group.
- Sharon Funk, DPT, serves as co-chair of the Musculoskeletal Health Expert Working Group of the International Prophylaxis Study Group
- Steven Powell, MBA, serves on the board of directors of the Hemophilia Alliance.
- Paul Limberis, PharmD, serves on the board of directors of The Alliance Pharmacy.

CU ANSCHUTZ Hemophilia & Thrombosis Center Information:

Program Co-Director/Principal Investigator: **Marilyn Manco-Johnson, MD**

Program Co-Director/Clinic Medical Director: **Michael Wang, MD**

Pharmacy Director: **Paul Limberis, RPh**

Program website: <https://medschool.cuanschutz.edu/hemophilia-thrombosis>.

Kempe Center for the Prevention and Treatment of Child Abuse and Neglect

Founded in 1972 by C. Henry Kempe, MD, the Kempe Center for the Prevention and Treatment of Child Abuse and Neglect is one of the longest-running and leading agencies in the field of child maltreatment. Kempe professionals work to improve the lives of children and families and the systems that serve them. The faculty and staff number over 70 professionals committed to realizing the Kempe vision: a world without abuse and neglect.

This unique organization, comprised of multi-disciplinary professionals, covers several core areas of work comprised of integrated health care, expert consultation, professional training, and institutional education, transformative research and pediatric law, ethics, and policy. The integration of these disciplines serves as a catalyst connecting child- and family-serving professionals with information and best practices to translate knowledge into action. Forty-nine years after Kempe opened the center's doors, the current team honors his legacy while looking ahead to the future by developing innovative strategies that transform the field.

In the past year, the leadership team has been implementing the five-year strategic plan released in 2020, making strides in reframing the Kempe Center organizational structure. Led by the Executive Director **Kathryn Wells, MD**, a new CORE executive team was installed to serve as thought leaders offering strategic vision intended to expand Kempe's reach and ensure that its work aligns with mission and vision. Several new additions to this executive team have been brought on board, including **Warren Binford, JD, EdM**, Kempe's new director for pediatric law, ethics and policy (also W.H. Lea for Justice Endowed Chair for Pediatric Law, Policy and Ethics). Binford will be responsible for developing robust policy advocacy, research, and education programs on child and family well-being, including preventing and treating child abuse and neglect. Kempe also welcomed **Suzanne Kerns, PhD**, as the new director of transformative research. She has directed a diverse set of research, teaching, and clinical activities toward a single professional aim: to improve the quality and effectiveness of child and family services in real-world settings in order to maximize their public health impact.

During the past year, Kempe's professionals have modernized connection with child- and family-serving professionals through new virtual mechanisms to provide exceptional service to the communities they serve while navigating the trying circumstances faced by a global pandemic.

Kempe's Child Protection team has continued to play a critical role in our community, providing evaluation, diagnosis, and treatment to suspected victims of child abuse and neglect during this time of extreme stress and uncertainty. They have continued to see patients in person while developing new telehealth processes to meet current needs.

In 2020, the Kempe team launched the Child Abuse Response and Evaluation Network to provide technical assistance and resources to develop and maintain a standardized response to suspected child maltreatment cases by establishing a network of designated healthcare providers throughout the state. Last year, funding for provider payments was cut due to state budget constraints related to the pandemic. Fortunately, with the support of Kempe's foundation, a private grant was obtained to offset this loss. Despite challenges, over 50 meetings were held with providers and community partners over the past year. In May 2021, a new group of providers virtually participated in the second annual new provider training. Thirty-seven providers from cities and towns across Colorado joined the training, which included behavioral health providers for the first time. Kempe looks forward to expanding this program, and the Colorado Governor and the Joint Budget Committee have recommended restoring last year's \$300,000 budget in the FY2021-2022 budget.

The COVID-19 pandemic has brought persistent anxiety to Colorado's children and families. In uncertain times like these, trauma-informed care is crucial. The Trauma-Responsive Implementation and Practice (TRIP) Program has made strides in training and implementing this necessary care during this crisis. This program fosters healthy, safe, and responsive environments in children, youth, and family-serving systems across Colorado. Over the past year, TRIP has made some notable progress in expanding its program throughout the state utilizing their Colorado Trauma-Responsive Schools Theory of Change Toolkit. Their work is especially relevant at the current time when there is so much uncertainty, loss, and transition, which can cause fear and difficult emotions for all, including teachers, administrators, families, and students.

Kempe's professional training programs also stepped up to meet new learning needs this past year. The Child Welfare Training System (CWTS) continued all state-wide pre-service training deliveries for caseworkers, supervisors, and foster families, expanding a virtual format developed at the beginning of the pandemic. This team continued to create new learning experiences specifically targeted to meet child welfare needs during this difficult time. Amid uncertainty with children going back to school in 2020, CWTS launched Not Too Cool for School, training educators and child welfare to work collaboratively towards better outcomes for children. A new Foster Parent Learning Exchange was established to create a support system designed to connect the foster parent community statewide and provide them with resources to meet their needs. Last year we also saw a global response to societal inequities and issues of systemic racism that were brought to light in the wake of the pandemic. In response, CWTS created supports for the communities they serve to address these inequalities and disparities to help cause change in the field. The team developed a new coaching program called Courageous Hearts | Disrupting Racism, a relationship coaching-informed approach to creating Race Intelligence. They also released a series called, Calling All Courageous Hearts. In these sessions, participants read, watched, or listened to a media resource (articles, poems, podcasts, songs, TEDTalks, and more) then joined small groups to engage in discussions about race equity in child welfare.

Last October, the Kempe Center also hosted its first international virtual conference, A Call to Action to Change Child Welfare. Over 1,400 people attended this groundbreaking event joining from 20 countries. This diverse community of practice convened to address issues of justice, social inequality, race equity, family leadership, and oppression in the child welfare and allied systems, and to discuss, debate, and propose solutions about how systems, communities, and individuals can begin the process of fundamentally changing the structure of these systems. A Kempe team of 10 faculty and staff collaborated over five months to create a highly ambitious conference agenda: 270 sessions over four days that spanned 17 hours each day, promoting new thinking, behaviors, and decision-making advocating that children, family, and community need to be the driving force in changing child welfare systems. The team looks forward to reconvening and expanding this community for the 2021 October event.

Kempe's faculty continue to contract with multiple states to provide independent evaluation for their child welfare systems, including an ongoing collaboration with the Quality Improvement Center for Workforce Development (QIC-WD) and a timely project launched in early 2020 with the Washington Department of Children, Youth and Families to implement telework practices that have been integral in strengthening their child welfare workforce during the pandemic.

Center faculty also embraced their responsibility for educating graduate students, pediatric residents, and postdoctoral fellows despite constraints by virtually hosting Kempe's Annual Interdisciplinary Research Institute. The team took the opportunity to use the flexibility of virtual learning to increase participation from across the country and to expand the pool of scholars trained to conduct child maltreatment research, increasing knowledge and the evidence base. Instructors included faculty from Kempe and several other leading research organizations and universities throughout the nation.

In the past year, Kempe's Fostering Healthy Futures (FHF) team ran two programs, a fully in-person program serving metro Denver and a pilot hybrid program of in-person mentoring and online skills groups serving children across the state. Beginning in the fall, three new agencies will be offering the FHF program. Kempe will act as the intermediary to provide ongoing training and support. Since Kempe will no longer be running the program, the FHF team will continue dissemination efforts for both the preteen and teen programs in Colorado and beyond.

Kempe's SafeCare© Team contract was also approved this year to continue working as the statewide SafeCare intermediary. They will continue to partner with the Colorado Department of Human Services and providers across the state to connect at-risk families to SafeCare Colorado.

This past year the Colorado Hospitals Substance Exposed Newborns (CHoSEN) Collaborative approached the Kempe Center to help develop a Perinatal Navigator Program that would take a collaborative approach to empower and support families, beginning in the perinatal period. CHoSEN is an effort to increase consistency in the implementation of best practices in the identification of and response to newborns prenatally exposed to substances throughout the Rocky Mountain region.

As of July 2021, The Rocky Mountain MST Network (formerly the Center for Effective Interventions) is now located at The Kempe Center. This team collaborates with agencies, communities, tribes, and governmental entities to support the development, implementation, and evaluation of multisystemic therapy, which promotes emotional and behavioral health and helps keep children and youth with their families and in their communities. Their work reduces juvenile justice and child welfare involvement and costs by increasing the availability of effective psychosocial interventions. MST is an intensive, home-based treatment model for families with children ages 12-17 who have serious delinquency and substance use problems and are at high risk for juvenile justice and child welfare involvement. MST is rated as a well-supported program on the Title IV-E Prevention Services Clearinghouse and is part of the Colorado state plan for FFPSA.

With Binford now serving as Kempe's director for pediatric law, ethics, and policy, the center has drastically expanded its work in this area. Human Rights Watch recently published a lengthy report summarizing Binford's research on the multi-disciplinary team interviewing children and families sent to Mexico under Migrant Protection Protocols (MPP) since 2019. The report was used by attorneys briefing the lawsuits challenging MPP in federal courts. This year, Binford was elected to serve as president of the International Human Rights Section of the Association of American Law Schools. She also chairs the International Law Association's first study group on children's rights comprised of renowned children's rights experts from around the world. In May, this group submitted a 121-page report on enforcing the rights of children in mMigration. Binford also recently published an illustrated book, "Hear My Voice: The Testimonies of Children Detained at the Southern Border of the United States." This book amplifies the voices and experiences of immigrant children detained at the Mexico-United States border using the children's actual words, illustrated by 17 Latinx artists. Binford conducted an extensive radio tour around the nation, promoting the book and a better understanding of children's rights and the current migration situation at our southern border.

<https://medschool.cuanschutz.edu/pediatrics/sections/child-abuse-and-neglect-kempe-center>

Linda Crnic Institute for Down Syndrome

We are on a mission to improve the lives of people with Down syndrome. We use state-of-the-art, transformational research platforms to decipher the unique biology and disease spectrum of people with Down syndrome. Our ultimate goal is to enable precision medicine approaches to improve health outcomes in Down syndrome, including the development of new diagnostic and therapeutic tools.

Founded in 2008, the Crnic Institute is led by **Joaquin Espinosa, PhD**, executive director, and **Huntington Potter, PhD**, director of the Alzheimer's disease program. The intramural faculty include professors Kelly Sullivan, PhD, Michael Yeager, PhD, Matthew Galbraith, PhD, Lina Patel, PsyD, and Angela Rachubinski, PhD, all of whom are supported by an administrative team led by Monica Lintz, MBA, director of finance and administration. The Crnic Institute is a collaborative, joint venture between the University of Colorado School of Medicine, CU Boulder, Children's Hospital Colorado, the Global Down Syndrome Foundation and the Anna and John J. Sie Foundation, funded by donor gifts and sponsored awards, including the National Institutes of Health.



\$20M
Funding received
From sponsored projects

1
UNIFYING
GOAL

\$27M
Gifts received
From external donors



Each year, we award grants to qualified University of Colorado investigators who want to apply their expertise to advance our understanding of Down syndrome. These Grand Challenge Grants are renewable, \$50,000-per-milestone awards meant to support extramural investigators until they can obtain independent funding for their Down syndrome research. The Grand Challenge program also provides support for other special projects or research resources, as needed by investigators. Since this program's inception in 2013, we have granted CU researchers 102 awards, funding \$6.7 million in Down syndrome research.

The Crnic Institute is also home to the most comprehensive cohort study of people with Down syndrome, called the Human Trisome Project (www.trisome.org). Launched in 2016, this project fuels a multidimensional biobank serving Crnic Institute investigators and enabling large pan-omics studies of Down syndrome in a way not previously possible. In 2020 and 2021, the Crnic Institute team leveraged the Human Trisome Project platform in collaboration with the School of Medicine and the Office of the Vice Chancellor for Research to create a sister project studying COVID-19, called the COVIDome Project (<https://medschool.cuanschutz.edu/covidome>). To-date, the Human Trisome Project involves:



750+
Participants



27,000+
Samples in biobank



30+
Projects supported



13
Publications

Altogether, the Crnic Institute's intramural and extramural faculty and programs comprise the largest academic home for Down syndrome research in the United States. Crnic Institute investigators hold more NIH awards for Down syndrome research than any other organization in the country. Furthermore, in close collaboration with NIH, our investigators and administrative staff are co-leading the creation of the INCLUDE Project Data Coordinating Center, which is the first and only centralized platform for Down syndrome research data and analysis tools.



100+ principal investigators



8 universities/hospitals



30+ departments/divisions



20+ active NIH awards

In 2021, the Crnic Institute launched a membership program to formalize our diverse, multidisciplinary community and commit further support to our members. We look forward to continuing local and national programming and collaborations that accelerate research and medical care for individuals with Down syndrome.

To learn more, visit us online at: www.crnicinstitute.org • www.trisome.org • Facebook and Twitter @CrnicInstitute

Ludeman Family Center for Women's Health Research

Women's health and sex differences research have been chronically understudied, creating a knowledge gap between men's and women's health. Until 1993, with the passage of the NIH reauthorization act, research studies typically included only men. Males were considered the standard for medical research and clinical care, and women were viewed as more complicated to study because of fluctuating hormone levels and menstrual cycles. Additionally, there was concern about exposure to experimental risk during childbearing years, and a belief that women would have the same responses as men had to treatments.

The Ludeman Family Center for Women's Health Research was founded on the idea that women's health and sex differences are important aspects of medicine and deserve attention in research. We envision a future in which research includes women and accounts for sex and gender differences, thus shaping better health care for all.

The Ludeman Center was founded in 2004 by **Judy Regensteiner, PhD**, JoAnn Lindenfeld, MD, and Lorna Moore, PhD. Today, the center is directed by Regensteiner, Deputy Director **Jennifer Engleby** and Associate Directors **Wendy Kohrt, PhD**, and **Jane Reusch, MD**. Laura Brown, MD, C. Neill Epperson, MD, and Anne Libby, PhD, are senior faculty members, and Amy Huebschmann, MD, is lead scientist for community outreach and education.

This year, we announced the center's new name: the Ludeman Family Center for Women's Health Research. This naming represents a transformational planned investment from the Ludeman family.

The Ludeman Center mission has three components.

Research: To perform cutting-edge research in women's health and sex/gender differences across the lifespan, with a focus on cardiovascular disease, diabetes, and the intersection of mental and physical health.

Researchers are foundational to our vision of transforming women's health. The Ludeman Center has developed a strong reputation for assisting young researchers in building their careers and acquiring external funding. Since 2006, the Ludeman Center has awarded nearly \$1.9 million in seed grants through internal peer-review processes to 74 researchers. These same researchers have in turn been awarded over \$107 million in external funding from the NIH, American Heart Association, American Diabetes Association and other major organizations. For every \$1 in seed grants, Ludeman Center scientists have been awarded \$55 from external sources. Our researchers work on projects across the lifespan and represent 35 different departments, divisions, and centers on campus. Our scientists are contributing to their fields both by furthering research and providing clinical care. Ludeman Center researchers have produced over 1,180 peer-reviewed publications since 2006. Over 18,000 patients are seen every year by Ludeman Center physician-scientists at adult and children's hospitals and clinics in the Denver area. These scientists bring their evidence-based findings to the clinic to improve health for patients and many have developed new clinics based on their research.

Mentoring: To mentor, fund, train, and retain the next generation of researchers to build careers in women's health and sex/gender differences research.

In addition to a strong understanding of scientific thinking and methods, researchers also must have leadership and management skills. As Ludeman Center scientists, they receive critical funding and intensive mentoring, academic and career development trainings, and a community of support. Over the past year, we organized and provided 12 training sessions.

Education: To educate the public and healthcare providers, so that our research findings are translated into improved care.

We also work with groups on campus and in the community to provide educational outreach. Each year, we hold more than 30 events, live and virtual, reaching a total of more than 3,400 participants. Highlighted below are some program offerings.

●**Let's Talk:** In partnership with UCHealth, the Ludeman Center organizes this lecture-based community education series that bridges research to care. By providing evidence-based information to the community, attendees can make more informed healthcare decisions for themselves and their families. In 2020 and 2021, we hosted five virtual programs on brain health, infectious diseases, and more.

In response to the COVID-19 pandemic, we transitioned these lectures online. In addition, every year we host an opportunity for high school girls to explore careers in health care and research at the CU Anschutz Medical Campus. The May 2021 event was held virtually and featured CU Anschutz faculty in psychiatry, endocrinology, pediatrics, and nursing.

●**Women’s Health Research Day:** This annual event features a nationally recognized keynote speaker and a poster session for campus researchers. In 2021, our keynote speaker was Patricia Gabow, MD, MACP, a leader in healthcare and former CEO of Denver Health for over 20 years, who spoke about women in health care.

●**Women’s Health Symposium:** This annual half-day CME-accredited training is an opportunity for medical professionals to learn the most recent evidence-based guidelines and treatments relevant to women’s health and sex differences. Topics have included: exercise in the management of diabetes, women’s heart failure, sex differences in cardiac arrhythmia, health disparities with COVID-19, and mental health of health care providers.

●**National Conference on Women’s Health and Sex Differences Research:** The Ludeman Center hosts a biennial national conference focusing on cardiometabolic health across the lifespan. The Ludeman Center National Conference features leading scientific experts and offers a program for community members to hear from prominent researchers. The next National Conference is scheduled for October 12-14, 2022 at the Broadmoor Hotel in Colorado Springs.

●**Annual Community Event:** As the Ludeman Center’s signature outreach event, the Annual Community Event focuses on educating the community about important health issues, providing evidence-based information, and highlighting women’s health and sex differences research. The 2020 keynote speaker was Laurie Santos, PhD, a renowned psychologist who shared research findings on happiness. The virtual event reached over 1,600 people in seven countries.

●**Outreach:** Educating our community and building awareness are critical to ensuring that women’s health and sex differences are studied and considered during the development and utilization of medical treatments. We established a monthly e-newsletter and have developed a robust presence on three social media platforms Twitter, Facebook, and LinkedIn. Collectively, they reach thousands of people in our community and around the country.

●**Community & Business Partnerships:** The Ludeman Center is proud to partner with community organizations and companies to regularly provide education and healthcare programs.

Additionally, we partner with groups on campus, in the community, and around the country and help bring large, institutional site grants to campus.

●On campus, the Ludeman Center participates in educational programs for faculty including Women in Medicine and Science.

●We are actively engaged with the community, raising awareness of and support for women’s health and sex and gender differences research. Our Community Advisory Board has been integral to our success, helping us raise over \$23 million in philanthropy since 2004. Additionally, community leaders who serve on our Medicine Cabinet provide advice, expertise, and connection to our community.

●Nationally, the Ludeman Center works closely with leaders in women’s health who are part of the Ludeman Center’s Scientific Council. In addition to the Ludeman Center director and associate directors, current members include Nanette Wenger, MD (Emory); Yoel Sadovsky, MD (Magee-Womens Research Institute); Bill Haskell, PhD (Stanford); Jill Goldstein, PhD (Harvard); Noel Bairey Merz, MD (Cedars-Sinai); Anne Peters, MD (USC); and Ginger Graham, MBA.

●Nationally, Regensteiner is on the advisory board of the Office of Research in Women’s Health at NIH. She is also the principal investigator of the Building Interdisciplinary Research Careers in Women’s Health NIH K-12 grant and the Doris Duke Fund to Retain Clinical Scientists. Kohrt is principal investigator of the NIH Specialized Center of Research Excellence in Sex Differences (SCORE) grant; Regensteiner is the director of the Career Enhancement Core for this program. These programs, although they are all national, benefit early career scientists on campus.

Other major accomplishments of 2020-2021 include:

●The Ludeman Center received a transformational philanthropic commitment from the Ludeman family that will help transform women’s health and sex differences research. This generosity was recognized by naming the Ludeman Family Center for Women’s Health Research.

●Awarded seven \$25,000 Early-Career Faculty Research Development Awards and 12 \$15,000 COVID-19 Relief Supplemental Grants.

- Formed a partnership with CU Innovations designed to encourage the translation of research findings of Ludeman Center faculty into inventions that directly impact patients and improve their lives.
- Garnered generous support to begin a scholar program on the Anschutz Medical Campus in 2021-2022.
- Ludeman Center scientists achieved a milestone of over \$107 million in grant funding directed to women's health and sex differences research since 2006.
- The Leaders Empowering the Advancement of Diveristy in Education, Research and Science (LEADERS) in Women's Health Committee encourages the development of endowed chairs in women's health across the field of medicine by bringing together endowed chair holders and key leaders in the field.

The Ludeman Center is a leading voice increasing awareness and change in women's health and sex and gender differences on campus, in the community and nationally. To learn more about our work or join our mailing list, visit www.ludemancenter.org.

Marcus Institute for Brain Health

The Marcus Institute for Brain Health (MIBH) was created in 2017 with a transformational gift from The Marcus Foundation. The institute provides specialty care for military veterans and retired elite athletes struggling with mild to moderate traumatic brain injuries (TBI), including concussion, and associated changes in psychological health.

MIBH provides innovative, interdisciplinary care through a three-day diagnostic evaluation involving neurology, physical therapy, speech and language pathology, neuropsychology, and other disciplines. This evaluation is usually followed by a three-week intensive outpatient program where these disciplines work with alternative therapies such as creative arts, acupuncture, yoga, mindfulness, and other therapies to create a personalized, holistic healing experience.

MIBH is led by **James P. Kelly, MD**, executive director, Wendi Petro, director of finance and administration, Irma Smith, director of clinical operations, Daniel Wilkerson, director of special projects, and Spencer Milo, director of veteran programs. MIBH has its own staff of clinicians and therapists and is augmented by faculty from multiple schools on the Anschutz Medical Campus.

The MIBH team is the TBI hub of the Gary Sinise Foundation Avalon Network and are honored to be serving America's Veterans by

- Providing state-of-the-art therapies and assisting in the transition to civilian life;
- Investigating new and better ways to identify and treat TBI and its associated psychological health conditions;
- Advocating for better reimbursement for the care Veterans deserve; and
- Teaching a new generation of expert TBI healthcare professionals.

Additional information regarding the Marcus Institute for Brain Health can be found online at <https://medschool.cuanschutz.edu/mibh>.

NeuroTechnology Center

The University of Colorado School of Medicine Neurotechnology Center (NTC), directed by Mark Dell'Acqua, PhD, celebrated its second anniversary on July 1, 2021. The NTC missions are: 1) To support core facilities that provide School of Medicine investigators access to key, cutting-edge technologies that are essential for neuroscience research at CU Anschutz; and 2) To work with School of Medicine departments to jointly recruit additional neuroscience-focused faculty to CU Anschutz who emphasize development and application of novel technologies, with a goal of building strong collaborative, cross-disciplinary research teams. Eight School of Medicine departments have joined the NTC as members, representing basic science and clinical programs.

The NTC also engages in educational and outreach activities by hosting/co-hosting and administering research seminars, retreats, and symposia in partnership with the Neuroscience Graduate Program, the Rocky Mountain Neuroscience Group, and the NSF-funded Rocky Wearable Microscopes Summit.

In addition, the NTC is a sponsor of the Summer Research Training Program and a supporter of the NINDS-funded BRAiN summer research program that provide research internships on the campus for undergraduate students from groups historically underrepresented in science.

NTC website: <https://medschool.cuanschutz.edu/neurotechnologycenter>

NTC Director: **Mark Dell'Acqua, PhD.**

NTC Administrator: Paula Robinson

NTC IT Specialist/Web Support: Christopher McClendon

NTC accomplishments 2020-21:

Faculty Recruiting:

In fall 2020, Daniel Kramer, MD, joined the School of Medicine faculty. Kramer, an NTC joint recruitment with the Department of Neurosurgery, is a neurosurgeon whose research program employs cutting-edge electrophysiological recording, signal processing, and data analysis methods to support deep brain stimulation implantation surgeries and other novel brain-computer interface technologies.

In Spring 2021, Jason Christie, PhD, joined the School of Medicine faculty. Christie, an NTC joint recruitment with the Department of Physiology and Biophysics, uses cutting-edge optical imaging and manipulation approaches and electrophysiological recording both in vitro and in vivo to study circuit function and plasticity in the mammalian cerebellum that underlies control of movement and motor learning.

NTC Cores:

The NTC manages six cores operating as three service-oriented core clusters that provide investigators with powerful transformative tools to incorporate cutting-edge approaches.

Core Cluster 1-Advanced Light Microscopy Core (ALMC): Richard Benninger, PhD (Director); Radu Moldovan, PhD (ALMC Manager); Dominik Stich, PhD; Gregory Glazner, MS

ALMC 20-21 Highlights:

- Total usage of the core: 3,460 hours
- Total number of laboratories that have used the core: 99
- Number of new users of the core: 55
- Number of papers published that acknowledge usage of the core: 21
- 2 OER grants received
- New light-sheet microscope system established
- Submitted NIH S10 grant for new STED super-resolution microscope system

Core Cluster 2-Optogenetics and Neural Engineering (ONE) Core, (IDEA) Core, and the Neuroscience Machine Shop: Gidon Felsen, PhD (Director); Andrew Scallon, MS (ONE Core manager); Ryan Williamson, PhD (IDEA Core manager); Michael Hall, PhD (Neuroscience Machine Shop manager)

ONE Core 20-21 Highlights:

- Designed novel equipment and method for acute and chronic stereotaxic control of high-density (Neuropixel) electrophysiological recording probes.
- Engineered robust hardware and software for concurrent recording of multiple commonly utilized signals in systems neuroscience experiments.
- Designed circuit to real-time transform an alternating analog signal into a signal suitable for commonly utilized analog-to-digital converters.

IDEA Core 20-21 Highlights:

- Conducted preliminary rat sciatic nerve recordings for a School of Medicine investigator working with the NTC In vivo Neurophysiology Core leading to a successful grant application to study peripheral nerve injury recovery.

- Produced a mobile device for neurology that can acquire three-dimensional video of patients performing a hand-motion task with the assistance of a physician. For HIPAA compliance, the computer was controlled without the use of a keyboard, mouse, or monitor.
- Automated an experiment for a School of Medicine investigator to deliver a water reward at various locations along a radius surrounding a head-fixed mouse.

Neuroscience Machine Shop 20-21 Highlights:

- Designed and built a surgical microscope mount and joystick control system for a prism-directed laser for otolaryngology.
- Phantom boxes and stainless steel probes for physician training purposes for radiation oncology.
- Novel hexagonal open-field chambers with accessories for the NTC Animal Behavioral Core.
- Custom designed behavioral apparatuses for neurosurgery.
- Designed and built a micro-drive system working with the NTC In vivo Neurophysiology Core to allow GRIN lenses and electrodes to be simultaneously lowered into brain (for recording and visualization of neuronal activity).

Core Cluster 3-Animal Behavior Core (ABC) and In Vivo Neurophysiology Core (IVNC): Michael Mesches, PhD (Director); Nicolas Busquet, PhD (ABC manager); Connie Brindly, BS; Jessica Carlsen

Animal Behavior Core (ABC) 20-21 Highlights:

- Helped research teams design, plan, and perform long-term and short-term behavioral studies.
- Instituted new behavioral testing paradigms (Dynamic Weight Bearing, Gait Analysis, Home Cage Monitoring)
- Total number of laboratories that have used the core: 15
- School of Medicine departments/divisions served: 10

In Vivo Neurophysiology Core (IVNC) 20-21 Highlights:

- Instituted new visual evoked potential recording and analysis and sciatic nerve recording and analysis services (collaboration with NTC IVNC).
- Added new electrode placement verification service
- Added new EEG recording data analysis service
- Upgraded rat EEG recording equipment
- Total number of laboratories who have used the core: 9
- School of Medicine departments/divisions served: 7

Perinatal Research Center

The Perinatal Research Center (PRC) is one of the leading national and international centers for research in perinatal biology and medicine, including studies of maternal, placental, and fetal physiology.

The PRC was built with funds from National Institutes of Health National Center for Research Resources with matching funds from the University of Colorado. Research at the PRC is funded by NIH grants and the Section of Neonatology in the Department of Pediatrics. The PRC houses nine faculty members who collectively hold multiple NIH R01 or equivalent awards, NIH K and other career development award, several pilot awards, and the University of Colorado T32 Training Program in Perinatal Biology and Medicine.

Research at the PRC involves reproductive and developmental physiology, biochemistry, and molecular biology. Primary aims of the research are to better understand processes involved in fetal growth and development and the response to adverse perinatal conditions.

Paul Rozance, MD, is the scientific director of the PRC. Rozance is the principal investigator of NIH R01 research project grants from both the National Institute of Diabetes and Digestive and Kidney Diseases and the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

Rozance is also the principal investigator and program director of the NIH-NICHD T32 Training Program in Perinatal Medicine and Biology, which has been funding neonatology, maternal fetal medicine, and non-clinician post-doctoral fellows at the university since 1979.

<https://medschool.cuanschutz.edu/pediatrics/research/programs/perinatal-research-center>

Rocky Mountain Taste and Smell Center

The Rocky Mountain Taste and Smell Center includes scientists who work on studies of the chemical senses including taste, smell, and chemical irritation of the oral and respiratory passageways. The goal of the Center is to facilitate research by providing communal resources and by bringing together productive investigators in the chemical senses and allied senses of hearing and balance. The center, under the leadership of **Diego Restrepo, PhD**, and **Tom Finger, PhD**, embraces work from 17 laboratories in five departments of the School of Medicine, including the Department of Cell and Developmental Biology, along with investigators from the CU School of Dental Medicine and the University of Denver. While the center provides direct support for infrastructure and multi-user research facilities, the underlying research is supported by more than 25 research and training grants from the National Institutes of Health totaling over \$5 million. Investigation of disorders of the senses of taste and smell is enhanced by cooperation and collaboration with the Sinus Clinic of UHealth University of Colorado Hospital and the Department of Otolaryngology.

University of Colorado Cancer Center

<https://medschool.cuanschutz.edu/colorado-cancer-center>

The University of Colorado Cancer Center (CU Cancer Center) is the only National Cancer Institute (NCI)-designated cancer center in Colorado. Nearly all researchers who participate in cancer-related basic, translational, clinical, population, and behavioral research in Colorado are CU Cancer Center members. This statewide inclusiveness of cancer researchers and academic institutions provides a scientific breadth and depth that strengthens the center's comprehensive cancer research and clinical care activities. The CU Cancer Center stands as a unique organization and resource in Colorado and the surrounding region in cancer research, clinical care, prevention, and outreach.

Vision: Prevent and conquer cancer. Together.

Mission: Uniting our community to overcome cancer through innovation, discovery, prevention, early detection, multidisciplinary care, and education.

The CU Cancer Center's history began with the award of an NCI Cancer Center Support Grant in 1988, resulting in a clinical cancer center designation. In 1997 the center was designated as an NCI Comprehensive Cancer Center indicating that it met stringent research-focused metrics in basic, clinical, translational, and population science research. In 2013, the center was elected as a member of the National Comprehensive Cancer Network (NCCN) and went from unranked to a top 50 cancer center over the past six years according to U.S. News and World Report. In February 2015, the CU Cancer Center joined the Oncology Research Information Exchange Network (ORIEN), a research partnership among top U.S. cancer centers that is designed to facilitate discoveries in precision medicine by CU scientists. In January 2021, the center successfully submitted its seventh competitive renewal (2P30CA046934-34). Based on the strong score, we expect to be funded for the 2022-2027 period starting in February 2022.

Strategic Goals for this next era are:

- Ensure a robust infrastructure to foster research across the spectrum from basic discovery to translation to prevention and control.
- Invest in targeted areas of research where the CU Cancer Center can best accelerate its impact.
- Perform highly innovative and accessible clinical trials.
- Provide unparalleled comprehensive patient-centered cancer care.
- Be the premier cancer center and destination of choice, regionally in five years and nationally in ten.

- Advance health equity and reduce disparities across the continuum from prevention to survivorship.
- Train the next generation of cancer researchers, providers, and administrators.
- Cultivate a cohesive, effective, accountable organization that attracts and retains outstanding talent.
- Secure sustainable funding.

Cancer Center Leaders

The senior leaders of the center represent the four research areas of a comprehensive cancer center, as well as key priority areas including community outreach and engagement, cancer research education and training, and cancer informatics and data sciences.

Senior Leaders	
Director	Richard Schulick, MD, MBA
Deputy Directors	Cathy Bradley, PhD and James DeGregori, PhD

Senior Leaders (cont.)	
Associate Directors:	
Basic Research	Heide Ford, PhD
Clinical Research	Christopher Lieu, MD
Population Science Research	Linda Cook, PhD*
Translational Research	Wells Messersmith, MD
Community Outreach & Engagement	Evelinn Borrayo, PhD
Cancer Research Education & Training	Eduardo Davila, PhD
Data Science and Cancer Informatics	Sean Davis, PhD*
Administration & Finance	Stephanie Farmer, MHA

*New leader

The center fosters cancer-focused research through the creation of formal scientific research programs. A program comprises the activities of a group of investigators who share common scientific interests and goals and participate in competitively funded research. Programs are highly interactive and lead to the exchange of information, experimental techniques, and ideas that enhance the individual productivity of scientists and often result in collaborations and joint publications. Ultimately, the success of a program is measured by scientific excellence and the emergence of productive collaborations.

Currently the center is comprised of four research programs, all of which are organized around mechanistic themes in cancer research.

Cancer Center Programs and Program Leaders	
Basic Sciences Molecular & Cellular Oncology (MCO)	Tin Tin Su, PhD, Craig Jordan, PhD, Patricia Ernst, PhD
Translational and Clinical Sciences Tumor-Host Interactions (THI) Developmental Therapeutics (DT)	Jennifer Richer, PhD, Michael Verneris, MD, Jill Slansky, PhD Lia Gore, MD, Dan Gustafson, PhD, Antonio Jimeno, MD, PhD
Population Health Cancer Prevention and Control (CPC)	Rajesh Agarwal, PhD, Jamie Studts, PhD, Stacy Fischer, MD

Affiliated Organizations

Academic Institutions

- University of Colorado Denver (CU Denver)
- University of Colorado Boulder (CU Boulder)
- Colorado State University (CSU)

Affiliated Hospitals

- UHealth University of Colorado Hospital (UCH)
- Children's Hospital Colorado (CHCO)
- Veterans Affairs Medical Center (VAMC)

Facts

Membership

- 214 Full members
- 56 Mentored members
- 71% of members are in the School of Medicine (SOM)

Research Portfolio

- 558 cancer related publications in FY20
- \$62.1M (direct costs) annual cancer-focused sponsored research funding
- \$49.0M (79%) held by members in the SOM

Clinical Trial Portfolio

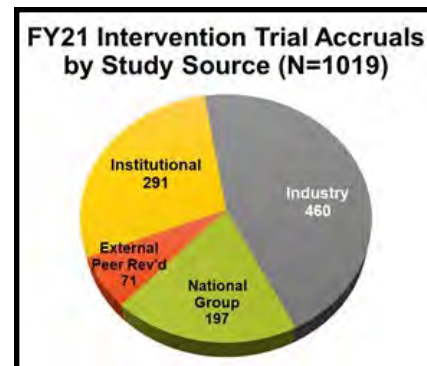
- 1,959 accruals to all types of human subject protocols
- 1,019 Intervention trial accruals
- 753 Observational trial accruals
- 187 Ancillary/correlative trial accruals

Major Accomplishments 2020-2021

- Submission of the 7th competitive renewal for the 2022-2027 period
- Recruitment of Linda Cook, PhD, as Associate Director for Population Science Research
- Recruitment of Sean Davis, PhD, as Associate Director for Data Sciences and Cancer Informatics
- Funding of an NCI Specialized Program of Research Excellence (SPORE) in Head and Neck Cancer (PIs: Antonio Jimeno, MD, PhD, and Xiao-Jing Wang, MD, PhD | 1P50CA261605-01)
- Over \$11 million invested in strategic initiatives and recruitments to support the Center's mission
- Selected Research Accomplishments:
 - ⇒CU Cancer Center, led by Dan Pollyea, MD, (DT), facilitated and led multi-institutional trials testing the efficacy of venetoclax-based therapy for older patients with AML. These trials demonstrated that venetoclax-based therapy induces durable remissions in most older patients with AML and substantially improved survival, leading to accelerated FDA approval in November 2018 and regular approval in October 2020. Follow-up studies led by the lab of Craig Jordan, PhD, (MCO) explored how this therapy alters cellular metabolism; the appreciation of the unique metabolic vulnerabilities of AML led to the discovery of a subset of AMLs that are refractory to the venetoclax therapy [1] and additionally for why AMLs in patients who relapse on conventional chemotherapy are mostly resistant to this therapy

Sponsor	Direct Cost \$s
Cancer Center Support Grant	2,878,617
NCI	14,382,083
Other NIH	17,097,856
Other Peer-Reviewed	7,957,360
Industry	12,634,630
Other Non-Peer Reviewed	7,115,233
Grand Total	62,065,779

*As reported to the NCI May 2021



[2], with therapeutic interventions to restore therapeutic responses currently in progress. References: [1] Pei S, **Pollyea DA (DT)**, Gustafson A, Stevens BM, Minhajuddin M, Fu R, Riemondy KA, Gillen AE, Sheridan RM, Kim J, **Costello JC (THI)**, Amaya ML, Inguva A, **Winters A (DT)**, Ye H, Krug A, Jones CL, Adane B, Khan N, Ponder J, Schowinsky J, Abbott D, Hammes A, Myers JR, Ashton JM, Nemkov T, **D'Alessandro A (MCO)**, Gutman JA, Ramsey HE, Savona MR, **Smith CA (DT)**, **Jordan CT (MCO)**. Monocytic Subclones Confer Resistance to Venetoclax-Based Therapy in Patients with Acute Myeloid Leukemia. *Cancer Discov*, 2020. PMID: 31974170 / PMC7124979 and [2] Jones CL, Stevens BM, **Pollyea DA (DT)**, Culp-Hill R, Reisz JA, Nemkov T, Gehrke S, Gamboni F, Krug A, **Winters A (DT)**, Pei S, Gustafson A, Ye H, Inguva A, Amaya M, Minhajuddin M, Abbott D, Becker MW, **DeGregori J (THI)**, **Smith CA (DT)**, **D'Alessandro A (MCO)**, **Jordan CT (MCO)**. Nicotinamide Metabolism Mediates Resistance to Venetoclax in Relapsed Acute Myeloid Leukemia Stem Cells. *Cell Stem Cell* 2020. PMID: 32822582 / PMC7655603 (available on 2021-11-05) ⇒Mentored member, Rustain Morgan, MD, (CPC), led a study that was inspired by his clinical observations of the superiority of PET with CT imaging to detect and appropriately stage non-small cell lung cancer. He hypothesized that low-income and racial/ethnic minorities may be less likely to receive these services, leading to less optimal treatment plans and poorer survival. Using the Surveillance, Epidemiology, and End Results-Medicare database, Morgan and mentors C. Bradley, PhD, (CPC) and S. Karam, MD, PhD, (DT) found that Blacks and Hispanics were less likely to receive PET with CT imaging relative to non-Hispanic whites. Awareness of this difference in standard of care represents an opportunity for clinical practice improvement that could reduce survival disparities and improve health equity. **Morgan RL (CPC)**, **Karam SD (DT)**, **Bradley CJ (CPC)**. Ethnic Disparities in PET/CT Utilization at Diagnosis of Non-Small Cell Lung Cancer. *J Natl Cancer Inst* 2020. PMID: 32134453 / PMC7735772

COVID-19 Initiatives and Contributions

- In March 2020, an unprecedented global pandemic suspended all campus activities. Amid this crisis, center leaders, shared resources, and staff joined together with campus leaders and colleagues to develop solutions to critical needs and shortages, innovate new ways to keep research moving forward, and joined in the efforts to develop testing and find answers. The creativity shown through innovations in operations and the rapid mobilization of our center's research expertise to support front-line efforts to provide testing and care, and to keep as much research going as possible, was impressive. While the contributions are too numerous to list them all in this report, here are some highlights:
- Chris Lieu, MD, Tiffany Colvin, and the Cancer Clinical Trials Office maintained a level of operations that allowed cancer patients to remain on or be added to clinical trials, providing them with critical cancer care.
- Natalie Serkova, PhD, and Jenna Steiner of the Animal Imaging Shared Resource worked tirelessly to continue critical animal imaging services to prevent research losses for investigators.
- Steve Anderson, PhD, and Lori Sherman from the Cell Technologies Shared Resource, in collaboration with Thomas Morrison, PhD, and Dara Aisner, MD, PhD, produced much-needed proteins to support testing for COVID-19 antibodies.
- Eric Clambey, PhD, Alistaire Acosta, MBA, and the staff of the Flow Cytometry Shared Resource revolutionized ways to enable remote operation of the shared resource's flow cytometers using remote desktop software.
- Angelo D'Alessandro, PhD, and Kirk Hansen, PhD, co-directors of the Mass Spectrometry Shared Resource, developed new methods in high-throughput omics to support processing thousands of COVID samples characterizing the serum, plasma, red blood cells, and other matrices from COVID patients within weeks of the start of the pandemic
- Joaquin Espinosa, PhD, Tom Flaig, MD, and numerous other investigators, shared resource directors, and campus leaders who created COVIDome – a highly collaborative, multidisciplinary effort to accelerate translational research in COVID-19 for the development of better prevention, diagnostic, and therapeutic tools.

Additional Notable Accomplishments

- Five supplements to the Cancer Center Support Grant funded in FY20:
 - ⇒SARS-COV-2 Environmental Constraint Effects on Cancer Prevention and Management Outcomes (3P30CA046934-32S3); Project leader: Evelinn Borrayo, PhD
 - ⇒Infrastructure Development and Team-Building for a Statewide Approach to Address Cancer and Aging in Colorado (3P30CA046934-32S4); Project co-leaders: Dan Sherbenou, MD, and Liz Kessler, MD

⇒Building Capacity to Engage Underrepresented Coloradoans in Developmental Therapeutics Research (3P30CA046934-32S5)

⇒Project co-leaders: Evelinn Borrayo, PhD, and Antonio Jimeno, MD, PhD

⇒Development of Standardized Electronic Treatment Plan Builds for NCI Cancer Centers (3P30CA046934-32S6)

⇒Project leader: Sunnie Kim, MD

⇒Boosting T-cell Immunity Against COVID19 after CAR T-cell Therapy by Vaccination (3P30CA046934-32S7)

⇒Project leader: Tuoqi Wu, PhD

- Two new NCI R01s to address issues faced by cancer patients and survivors in rural communities

⇒Precision Lung Cancer Survivorship Care Intervention: A Randomized Controlled Trial Serving Rural Survivors and Communities (Co-PIs: Jamie Studts, PhD and Jessica Burris, PhD | 1R01CA240097-01)

⇒Improving Timeliness and Quality of Care for Rural Lung and Head-and-Neck Cancer Patients (PI: Evelinn Borrayo, PhD | 1R01CA254730-01)

- Numerous impactful publications out of 558 total cancer-focused publications reported to the NCI in December 2020, including:

⇒Higa KC, Goodspeed A, Chavez JS, De Dominic M, Danis E, Zaberezhnyy V, Rabe JL, Tenen DG, **Pietras EM (THI)**, and **DeGregori J (THI)**. Chronic Interleukin-1 exposure triggers selection for Cebpa-knockout multipotent hematopoietic progenitors. *J Exp Med.*, 2021. PMID: 33914855 / PMC8094119

⇒Borrayo EA (CPC), Scott KL, Drennen A, Bendriss TM, **Kilbourn KM (CPC)**, **Valverde P (CPC)**. Treatment challenges and support needs of underserved Hispanic patients diagnosed with lung cancer and head-and-neck cancer. *J Psychosoc Oncol*, 2020. PMID: 31920170

⇒Jordan KR, **Sikora MJ (THI)**, **Slansky JE (THI)**, Minic A, **Richer JK (THI)**, Moroney MR, Hu J, Wolsky RJ, Watson ZL, Yamamoto TM, **Costello JC (THI)**, Clauset A, **Behbakht K (DT)**, **Kumar TR (CPC)**, **Bitler BG (DT)**. The Capacity of the Ovarian Cancer Tumor Microenvironment to Integrate Inflammation Signaling Conveys a Shorter Disease-free Interval. *Clin Cancer Res* 2020. PMID: 32928797 / PMC7923250

⇒Stevens BM, Jones CL, **Pollyea DA (DT)**, Culp-Hill R, **D'Alessandro A (MCO)**, **Winters A (DT)**, Krug A, Abbott D, Goosman M, Pei S, Ye H, Gillen AE, Becker MW, Savona MR, **Smith C (DT)**, and **Jordan CT (MCO)**. Fatty acid metabolism underlies venetoclax resistance in acute myeloid leukemia stem cells. *Nature Cancer*, 2020. PMID: 33884374 / PMC8054994

⇒Min M, Rong Y, Tian C, **Spencer SL (MCO)**. Temporal integration of mitogen history in mother cells controls proliferation of daughter cells. *Science*, 2020. PMID: 32241885 / PMC8363187

- \$18.7 million total costs in additional new peer-reviewed cancer-focused funding in FY21 including:

NCI Grants New in FY21					
Sponsor	PI	Grant #	Start Date	Project Title	Total Costs Awarded
NCI	Altunbas C	1R01CA245270-01A1	9/15/2020	Improving Quantitative Accuracy and Tissue Visualization in CBCT Guided Radiation Therapy	460,915
NCI	Anderson SM with Findlay V and Turner DP	1R01CA245143-01A1	7/1/2020	Lifestyle Associated Reactive Metabolites and their Negative Impact on Breast Cancer Risk	459,328
NCI	Fishbein L	1R01CA246586-01A1	8/4/2020	Inherited Genetic Variation and Penetrance of Hereditary Paraganglioma-Pheochromocytoma Syndrome	366,745
NCI	Foreman N	1R01CA239302-01A1	7/1/2020	Epigenetic Regulation of LDOC1 Drives Tumor Biology in High Risk Ependymoma	355,706
NCI	Jones B	1R21CA249647-01A1	12/1/2020	Coded-aperture Compton scatter imaging for real-time tumor motion tracking during ablative radiotherapy	172,460
NCI	Jordan C	1R35CA242376-01A1	9/8/2020	Therapeutic Targeting of Human AML Stem Cells	340,338
NCI	Kutateladze T	1R01CA252707-01A1	7/1/2020	Molecular Analysis of ASH1L	380,148
NCI	LaBarbera D	1R01CA251361-01	8/1/2020	The Development of First-in-Class Inhibitors of Oncogenic CHD1L for the Treatment of Colorectal Cancer	354,514
NCI	Scherer L	1R37CA254926-01	2/1/2021	Understanding Affective Processing of Scientific Evidence to Promote Informed Choice for Breast Cancer Screening	663,745
NCI	Tennis M with Magin C	1R21CA252172-01	7/15/2020	Engineering Ex Vivo Models of Lung Cancer and Chemoprevention	399,830
NCI	Watson Z	1R03CA249571-01A1	12/3/2020	Targeting histone methyltransferases EHMT1 and EHMT2 to sensitize PARP inhibitor-resistant ovarian cancer	77,750
NCI	Weiser M and Nemenoff R	1R21CA255246-01	12/1/2020	The Lung Tumor Microenvironment: Role of Resident Pulmonary Vascular Progenitor Cells in Cancer Progression and Metastasis	218,089
Total NCI					4,249,568

Other NIH Cancer-Focused Grants New in FY21					
Sponsor	PI	Grant #	Start Date	Project Title	Total Costs Awarded
NIDCD	Barlow L	1R01DC018489-01A1	7/1/2020	Characterization of Progenitor Populations in Adult Taste Epithelium	509,332
NIAID	Black J Sullivan K	1R01AI155918-01	1/4/2021	Defining the Role of DNA Rereplication of Chromosome 21 in the Development and Pathophysiology of Down Syndrome	1,918,500
NIA	Hesselberth J	1R01AG071467-01	9/11/2020	Biochemistry at Single-Cell Resolution: A New Approach to Understand Functional Heterogeneity	652,347
NIGMS	Luger K, Stowell M, and Hoenger A	1U24GM139174-01	9/8/2020	CU Boulder Center for Cryo-ET (CCET)	36,610
NIAID	Kedl R	1R01AI148919-01A1	8/19/2020	CD8 T Cell and B Cell Collaboration Following Subunit Vaccination	2,479,996
NIA	Kutateladze T	1R56AG067664-01	9/15/2020	Targeting Acetylated Histone H4 by MLL4	511,945
NIDCR	Lu S and Frank D	1R21DE029262-01A1	7/1/2020	Oral Microbiota and Toll-Like Receptor Pathways in Head and Neck Cancer	233,250
NIAID	Rincon M	1R56AI148434-01A1	12/1/2020	Targeting mitochondrial regulator MCJ to enhance CD8 cell immune response	316,407
NIAID	Taatjes D	1R01AI156739-01	9/22/2020	Mediator Kinases as Interferon Antagonists in Down Syndrome	494,478
NIGMS	Taatjes D	1R35GM139550-01	1/1/2021	Mechanisms of RNA Polymerase II Transcription Regulation	633,029
NIAID	Tamburini B	1R01AI155474-01	9/21/2020	PD-L1 Reverse Signaling in Dermal DCS Promotes DC Migration and Skin Immunity to Cutaneous Pathogens	452,434
NIAID	Tamburini B	1R21AI155929-01	11/23/2020	Molecular tracking of antigen following vaccination	227,700
NICHHD	Thorburn A and DeGregori J	1R01HD103828-01	9/18/2020	Down Syndrome as a Systemic Autophagy Deficiency Disorder	2,594,673
NIGMS	Wuttke D	1R01GM139274-01	7/7/2020	RPA and RPA-Like Complexes at Telomeres	302,738
Total Other NIH					11,363,439

Select Other National-Level Cancer-Focused Grants New in FY21

Sponsor	PI	Grant #	Start Date	Project Title	Total Costs Awarded
DOD	Flaig T	W81XW2010853	9/30/2020	Optimizing High-Dose Testosterone Therapy for the Treatment of Advanced Prostate Cancer	1,166,247
DOD	Foreman N	W81XWH2010672	9/30/2020	Single-Cell RNAseq Directed Targeting of Therapy-Resistant Subpopulations that Drive Relapse in Childhood Ependymoma	311,000
DOD	Richer J	W81XWH2010617	7/15/2020	Targeting Metastasis by Inhibiting Breast Cancer Metabolism and Immune-Suppression	777,498
ACS	Sikora M	RSG-20-042-01-DMC	9/1/2020	Novel Roles of MDC1 in Endocrine Response and Resistance in Breast Cancer	792,000
Total Select Other National Sponsors					3,046,745
Combined Total Costs for New Grants Awarded					18,659,752

New Members in FY21

Cancer Center Program	Member	Member Type	Academic Rank	Affiliation
Cancer Prevention & Control	Brubaker, Jed	Mentored	Assistant Professor	Information Science College of Media, Communication and Information University of Colorado Boulder
Cancer Prevention & Control	Davis, Sean	Full	Professor	Medicine Medical Oncology School of Medicine University of Colorado Anschutz Medical Campus
Cancer Prevention & Control	Lum, Hillary	Mentored	Associate Professor	Medicine Geriatric Medicine School of Medicine University of Colorado Anschutz Medical Campus
Cancer Prevention & Control	Marker, Ryan	Mentored	Assistant Professor	Physical Medicine & Rehabilitation School of Medicine University of Colorado Anschutz Medical Campus
Cancer Prevention & Control	O'Leary, Sean	Full	Professor	Pediatrics Infectious Diseases School of Medicine University of Colorado Anschutz Medical Campus
Cancer Prevention & Control	Shields IV, Charles	Mentored	Assistant Professor	Bioengineering College of Engineering and Applied Science University of Colorado Boulder
Cancer Prevention & Control	Singh, Sarguni	Mentored	Assistant Professor	Medicine Hospital Medicine School of Medicine University of Colorado Anschutz Medical Campus
Developmental Therapeutics	Davizon-Castillo, Pavel	Mentored	Assistant Professor	Pediatrics Hematology, Oncology & Bone Marrow Transplantation School of Medicine University of Colorado Anschutz Medical Campus
Developmental Therapeutics	Faulk, Kelly	Mentored	Assistant Professor	Pediatrics Hematology, Oncology & Bone Marrow Transplantation School of Medicine University of Colorado Anschutz Medical Campus
Developmental Therapeutics	Gross, Thomas	Full	Professor	Pediatrics Hematology, Oncology & Bone Marrow Transplantation School of Medicine University of Colorado Anschutz Medical Campus
Developmental Therapeutics	Patil, Tejas	Mentored	Assistant Professor	Medicine Medical Oncology School of Medicine University of Colorado Denver
Molecular & Cellular Oncology	Asturias, Francisco	Full	Associate Professor	Biochemistry & Molecular Genetics School of Medicine University of Colorado Denver
Molecular & Cellular Oncology	Brumbaugh, Justin	Mentored	Assistant Professor	Molecular, Cellular & Developmental Biology College of Arts and Sciences University of Colorado Boulder
Molecular & Cellular Oncology	Cooper, Julia	Full	Professor	Biochemistry & Molecular Genetics School of Medicine University of Colorado Denver
Molecular & Cellular Oncology	Dahl, Nathan	Mentored	Assistant Professor	Pediatrics Hematology, Oncology & Bone Marrow Transplantation School of Medicine University of Colorado Anschutz Medical Campus
Molecular & Cellular Oncology	Greene, Casey	Full	Professor	Biochemistry & Molecular Genetics School of Medicine University of Colorado Denver
Molecular & Cellular Oncology	Musselman, Catherine	Full	Associate Professor	Biochemistry & Molecular Genetics School of Medicine University of Colorado Denver
Tumor-Host Interactions	Kohler, Mark	Mentored	Assistant Professor	Pediatrics Hematology, Oncology & Bone Marrow Transplantation School of Medicine University of Colorado Anschutz Medical Campus
Tumor-Host Interactions	Woods, David	Mentored	Assistant Professor	Medicine Medical Oncology School of Medicine University of Colorado Denver

Webb-Waring Center

Webb-Waring Center (WW) continues basic and translational investigations of inflammation and immunologic mechanisms that contribute to health and disease. This unifying focus fits well the stated mission of the WW which is “to conduct and teach innovative biomedical research that improves understanding, treatment and prevention of diseases worldwide.”

Led by **John E. Repine, MD**, the Waring Professor of Medicine, Pediatrics, and Surgery, WW’s integrated research projects are gaining a better understanding of the causes, diagnosis, treatment, and prevention of common disorders like the Acute Respiratory Distress Syndrome (ARDS), diabetes, multiple sclerosis, atherosclerosis, traumatic brain injury, fatty liver disease, the metabolic syndrome, and macular degeneration. Many of these efforts are also directed to learning about the importance and finding ways to combat the effect of aging on health and disease progression.

WW’s research endeavors are focused on developing translational discoveries that have more immediate application to human health care. This orientation has led to patenting and developing several innovations by Repine that are being supported by the Knoebel and Bonfils-Stanton Foundations. David Wagner, PhD, has secured competitive grants from the NIH SBIR and the Gates Grubstake programs to advance new technologies that deal with the treatment and prevention of diabetes, multiple sclerosis, and other autoimmune disorders.

WW has highly competitive training programs for undergraduate and medical students who are interested in biomedical research. The WW Colorado Undergraduate Summer Program (“CUSP”) that was founded and directed by Repine has become nationally prominent. More than 100 undergraduate students from universities nationwide apply to the annual CUSP summer program. Following a highly competitive selection process, approximately 20 interns—half of them meeting diversity designations—are selected from Princeton University, the University of Notre Dame, University of California San Diego, Stanford University, Williams College, Baylor University, University of Denver, University of Colorado, University of Oregon, Colorado State University, and other schools. CUSP is supported by Repine’s recently renewed five-year undergraduate diversity training grant from the NIH, the North Foundation, endowments established by Brian Fitzgerald, and generous donors. In addition, approximately 10 emerging second-year Colorado medical students from diverse backgrounds are supported by the Department of Medicine DREAM Program, led by Repine. They also participate in a WW summer research training program. At the end of the summer, all students present research in a formal campuswide poster session. These pipeline research training programs fit with other CU pipeline programs designed to recruit and inspire young individuals to learn and contribute to research that impacts medical care.

<https://medschool.cuanschutz.edu/webb-waring-center>



The photo above is courtesy of @cumedschool Instagram, April 22, 2021.



Vice Chancellor for Health Affairs

The photo above is courtesy of @cuanschutz Instagram, March 20, 2021.

Colorado AHEC Program

Mission: We work to ensure health equity in Colorado. We increase the diversity and distribution of the health care workforce to address health care disparities in this state. We support practice transformation throughout Colorado to ensure high-quality health care delivery for everyone. We serve as the link between Coloradans, state resources, and the resources of Anschutz Medical Campus to help healthy people thrive in healthy communities.

Vision: We envision every person in Colorado having the opportunity to attain their full and best health potential.

Colorado AHEC (COAHEC) is jointly funded by a federal grant from the Health Resources and Services Administration (HRSA) and by the Vice Chancellor for Health Affairs with the University of Colorado Anschutz Medical Campus. COAHEC is celebrating its 44th year of continuous operation.

COAHEC received new five-year funding from HRSA in 2017. The current HRSA five-year cycle (2017-2022) requires COAHEC to address the following goals:

- **Diversity:** Increase the potential for secondary, college, and health profession students from underrepresented populations, educationally disadvantaged, and rural backgrounds to successfully pursue a health profession career with an emphasis in public health;
- **Distribution:** Increase the potential for health profession students in medicine, dentistry, nursing, pharmacy, public health and allied health to practice in a rural or urban underserved community by immersing them in rural or underserved community experiences through community-based education training programs, field placements, and interprofessional education and training; provide access to evidenced-based health information, accredited high-quality continuing education programs and support for health professionals serving in rural and medically underserved areas in Colorado; and
- **Practice Transformation:** Facilitate and support practice transformation of Colorado's healthcare system by promoting a patient-centered approach, addressing social determinants of health through a team-based, data-centered approach with a focus on improving quality and community health outcomes in rural and medically underserved areas.

The AHEC system in Colorado is organized into six regional centers overseen by COAHEC Program office on the Anschutz Medical Campus (AMC). The entity known as Central Colorado AHEC is no longer in business and we welcomed a new 501(c)3, Front Range AHEC, to serve the areas in the urban corridor. The remaining five regions are also titled geographically, based on the areas of the state in which they serve: Centennial, San Luis Valley, Southeastern Colorado, Southwestern Colorado, and Western Colorado. The six regional AHEC offices work under the grant directives in collaboration with the COAHEC Program Office, which provides governance and guidance in meeting grant and program deliverables. The COAHEC Program Office partners with the School of Medicine, including the Physical Therapy and Child Health Associate/Physician Assistant programs, and the School of Dental Medicine, College of Nursing, and Skaggs School of Pharmacy and Pharmaceutical Sciences, to meet the program's goals under the HRSA grant.

Colorado AHEC Program Office Leadership:

Josina Romero O'Connell, MD is an assistant professor in the Department of Family Medicine in the School of Medicine. She is a family medicine doctor at Denver Health's Montbello Clinic and a Faculty COMPASS Guide for the new Longitudinal Integrated Clerkship (LIC) curriculum in the School of Medicine. She serves as principal investigator on the HRSA grant and on the HRSA CARES Act Grant. She is pending acceptance of a new NIH grant, Discover Health/Descubre La Salud 2.0 to work with StarNet and OMSI in continuation and improvement of the completed original grant, Discover Health/Descubre la Salud. She is working with the School of Medicine LIC program to develop rural LIC sites for the future curriculum change and is on faculty supporting the Rural Track Program. As a former public secondary school teacher for 17 years, her work's emphasis is on educating and delivering care and education to underserved people throughout Colorado, with an emphasis on the Spanish-speaking community, a main mission for the Colorado AHEC program.

Udai (Ken) Tadikonda, the administrator for COAHEC, has more than 16 years of experience in accounting, finance, budget development, office administration and management, grant administration, and community programs. He worked from September 2002-April 2010 in accounting and finance at Johnson & Wales University, where he served in the roles of assistant professor and controller and director of human resources. Ken was also the interim controller at Community College of Denver from April 2010-August 2011. He served as the accounting manager at Auraria Higher Education Center from August 2011-October 2015 before joining the University of Colorado Cancer Center as the assistant director of finance. From December 2018 -November 2019, Ken worked as the business strategy and fiscal planning analyst in the Office of the Chief Financial Officer of the Anschutz Medical Campus. Throughout his career, Ken has worked with 501(c)3's in accounting and finance and progressed into management roles. Colorado AHEC's mission and vision.

Matthew Hess is the academic services program manager for COAHEC. Matt has been an educator for his entire career. He oversees AHEC's pipeline programs including the newly developed Health Occupations Promoting Equity (HOPE) statewide high school pipeline designed to provide rural and underserved students programming to learn more about the many careers available in health care. He is overseeing the on-going development and implementation of AHEC Scholars, a HRSA program initiative new to this funding cycle that connects students in health career programs around the state to build skills in team-based health care. He oversees the annual Advisor's Day that bring students and career counselors to this campus, as well as the newly implemented Colorado AHEC Medicina y Urban-Rural Art Lessons en Salud (MURALS) program. COAHEC received a grant award from HRSA under the CARES Act 2020 and Matt manages activities within this grant now in a no-cost extension through the end of October 2021.

Samantha Hanson has over 26 years of experience in information technology development and oversight, primarily in health care and medical education. Prior to transitioning her career into information technology, she worked in applied molecular biology for five years. For the last five years, Sam has worked to design and improve the implementation of the Salesforce platform database for COAHEC, which is used by all six regional AHEC Centers and the Program Office. Salesforce is used to collect, analyze, and report all activities and clinical housing rotations for the current HRSA grant as well as all other private grants. Sam serves as an evaluator for the current HRSA grant and works to design and implement the evaluation tools and provide the technical support for their use.

Patti Jo Wagner has over 21 years of experience in customer service, project management, event management, and administration for many public, private, and nonprofit entities. Her work has ranged from initiation and coordination of educational programs, special events, and volunteer outreach to administration and support of executive level staff. Her work at COAHEC has advanced the quality of programming here and this year she was promoted from a program assistant I to an academic services senior professional. She is the team lead on key COAHEC activities, such as the COAHEC health screenings offered at the National Western Stock Show, is the housing coordinator of COAHEC, and the event coordinator for the COAHEC biennial NEAR Conference. She provides graphic design, editing, reporting and evaluation assist, and other administrative support as needed.

We welcomed **Maria Francisca Zabalaga-Haberman** (Fran) to our staff in January 2021. Fran is a recent graduate of the School of Medicine's Master of Science in Modern Human Anatomy with a certification in Anatomical Science Education and brings an educator-specialist perspective to our programs. She has experience in coordination of undergraduate pipeline programs at Denver Health. She revived our Anatomy in Clay program and implemented it virtually to HOPE students this summer. As a certified medical Spanish interpreter, she works on written and oral translations of many of our materials. She is heading up the development and implementation of the much-needed refresh of the COAHEC Cadaver Experience and is leading the Gang Action Program initiative in the initial stages of its development. She assists our finance administrator in bookkeeping, our evaluator in data analysis, and has become an integral member of the COAHEC housing team.

AHEC Accomplishments during 2020-2021

COAHEC continued to implement new initiatives during the pandemic. Most of the year we continued to work in a remote environment. We returned to a hybrid model of work in the office on July 1, 2021, and will continue using this model while keeping our offices fully staffed.

- Provided funding for the six regional AHEC offices to run programming with over 2,700 contact hours and reached nearly 37,000 Coloradans in medically underserved and rural communities, which is nearly 57% of non-pandemic totals.
- Provided 17,971 nights of housing for health professions students serving clinical rotations away from the Anschutz Medical Campus (a reduction of approximately 2,700 nights due to COVID-19 pandemic). Comparatively, provided 20,641 nights of housing in the first pandemic year (2019-2020). Historically, pre-pandemic totals have been, approximately, 24,000 nights of housing annually.
- Effected our new housing policy to address long-term housing for extended rotations for the School of Medicine’s LIC curriculum.
- Conducted a virtual training event for 79 Colorado faculty and pre-health advisors who advise over 19,000 students from high schools, two-year and four-year colleges.
- Participated in and presented a session at the virtual National AHEC Organization’s biennial conference in June-July 2021.
- Developed, implemented, and presented our new COAHEC Networking Education and Research biennial conference to 931 attendees in a virtual format. In the fall 2020, winter 2021, and spring 2021, we rolled out sessions and provided 326 continuing education (CE) credits in the disciplines listed in the table below. These CE credits are the most that COAHEC has offered in a single year.

FY 2020-2021	Year offered	CE credits available	Total CE credits awarded		
			CNPD	CDE	CME
Preceptor 101	2020	5	45	15	70
CU School of Medicine Curriculum: Reform, Revision, Redesign	2020	1	0	0	3
A Pathway for Rural Health Care to Thrive in a COVID World	2020	1	0	3	1
Burnout and Healing in the Face of Global Pandemic	2020	1	3	3	7
“Basics of Gender Affirming Care”	2020	3	36	9	87
The San Luis Valley Unsheltered: A Story of Barriers to Health and a Tool Kit for Authentic Engagement.	2021	1	1	1	2
Populations Experiencing Homelessness & Pandemic Implications	2021	1	6	4	9
Closing the Gap—Perceptions & Reality of Youth Substance Use	2021	1	0	0	3
COVID-19 and The Indian Health Service: Lessons from A Rural Medical Center in the Four Corners	2021	1.5	3	3	12
Totals		15.5	94	38	194

- We ended the Cadaver Experience/Obesity project and are developing an authentic cadaver pipeline experience that discusses modern dissection, prosection, and technology; the importance of cadavers in arts and medicine; and the ethics of cadaver use.
- Submitted a new NIH SEPA grant proposal to continue the work accomplished in our completed Discover Health/Descubre la Salud program that provided an interactive bilingual library health exhibit and reached Colorado communities including Sterling, Evans, Aurora, and Pueblo. This program’s community outreach focused on bilingual English/Spanish education for adults and children, with emphasis on obesity, diabetes and cardiovascular disease. It built on strong partnerships between the regional AHEC offices and local libraries to provide health education to rural and underserved communities. Our data suggested the increased collaboration among AHEC, state libraries, StarNet, and now Oregon Museum of Science and Industry (OMSI), to create permanent learning centers in select libraries, provide community outreach and education, and expand our delivery of free health screenings to those communities.

- Through May 31, 2021, COAHEC continued to provide support and grant management for the Urban Underserved Track (UTT). The track provided students with the skills and support needed to become health care providers who are committed to work in urban underserved communities.
- Continued the development and oversight of the AHEC Scholars Program, an interdisciplinary education and training program with curriculum that trains individuals seeking health care certifications to use those certifications in service to rural and/or underserved populations. We have enrolled over 324 students across three cohorts, 16 students have fully completed all portions of the program, 39 students have completed the didactic and experiential portions of the program and are in a one-year follow-up period. HRSA mandates most AHEC Scholars should complete this program in the last two years before graduation from their undergraduate education or post high school training programs. For each AHEC Scholar, the curriculum provides:
 - 40 hours of training in interprofessional, community-based practice in a rural and/or an underserved area.
 - 40 hours didactic education focused on five national core topic areas including: Interprofessional Education, Behavioral Health Integration, Social Determinants of Health, Cultural Competency, and Practice Transformation and HRSA defined health issues important to Colorado. These include: The Opioid Epidemic, COVID-19, Cannabis, Oral Health, Access to Mental Healthcare, Suicide, and Oil and Gas Development.
- Continued our work in the opioid use disorder (OUD) epidemic by enrolling 311 individuals to participate in our curriculum modules this year alone. The free modules train individuals working on the front lines of the opioid crisis by offering free online self-paced learning modules. Family members and friends of trainees who are struggling with an OUD are also encouraged to participate in the training. Trainees gain knowledge in treatment, recovery, harm reduction, and they learn how to conduct opioid abuse educational outreach programs in their communities. Twenty-five individuals have completed all the modules.
- Developed a statewide arts in medicine program, COAHEC Medicina y Urban-Rural Art Lessons en Salud (MURALS).
- Is writing, developing, and producing, in collaboration with Denver Health's Montbello Clinic, a patient informational video that informs people on telemedicine and its effective use in their health care.
- Updated the COAHEC website into user-friendly, educational format. <https://www.cuanschutz.edu/centers/coahec>
- Worked with our regional Centers to complete the following COVID-19-related programming and activities with funds from the HRSA Cares Act Grant:
 - Distributed over 8,000 masks and trained nearly 2,000 individuals in the use of masks.
 - Trained 111 healthcare workers in the use of personal protective equipment (PPE).
 - Trained 38 healthcare workers in communication while wearing PPE.
 - Trained 440 patients on telehealth.
 - Trained 133 providers on burnout prevention.
 - Educated 302 individuals about COVID-19 vaccines.
 - Added Spanish translation in some regional centers. Services included creating Spanish language versions of mask education materials and a vaccine education video.
 - Recorded 200 interviews in Centennial AHEC concerning the personal impact of the pandemic on health care workers. The interviews were edited into several short videos to provide historical context regarding provider response to a global pandemic
 - Approved by HRSA to add COVID-19 to our current and emerging topics, and to AHEC Scholars curriculum. We produced a video titled "Messaging for Mask Wearing" to support healthcare workers in preventing disease transmission.
- Maintained collaborative relationships with other organizations and programs whose goals complement the AHEC mission. These include:
 - Colorado Health Extension System (CHES) coordinates and facilitates practice transformation activities across Colorado.
 - Colorado Consortium for Prescription Drug Abuse Prevention.

- o Rocky Mountain Public Health Training Center.
- o Patient Navigator Training Center.
- o Anschutz Marketing and Recruiting Collaborative.
- o University of Colorado's Central Office of Diversity, Equity, Inclusion and Community Engagement at the Anschutz Medical Campus.
- o National Institute of Medical Assistant Advancement.
- o Colorado Rural Health Center.
- o Colorado Community Health Network.
- o Colorado Department of Public Health and Environment.
- o Colorado and National Health Service Corps.
- o Denver health and Hospital Authority.
- o Colorado Center for Nursing Excellence.
- o CU School of Medicine Office of Community-Based Medical Education
- o ECHO Colorado
- o STAR Library Network (STAR Net)
- o Colorado Association of Family Medicine Residencies
- o Oregon Museum of Science and Industry
- o Knight Williams, Inc.

Center for Bioethics and Humanities

The University of Colorado's Center for Bioethics and Humanities (CBH) offers an array of ethics, humanities, arts, and health law programs that are integral to academic life and work across CU Anschutz and that enrich university and community-based programs across all four CU campuses and around the state.

- **Education and training:** CBH faculty are involved in teaching learners in all professional schools and allied health programs at CU Anschutz and in undergraduate and graduate programs on the Denver, Boulder, and Colorado Springs campuses.
- **Clinical service:** the clinical ethics consultation programs of the two campus hospitals are integral aspects of care for patients seen on our campus and provide critical support to affiliated hospitals and clinics across the state.
- **Research:** CBH researchers focus on conducting world-class empirical research on topics at the intersection of health policy and bioethics including but not limited to medical aid in dying, disability, AI ethics, stakeholder engagement in research, real-world evidence generation, mass drug administration, college sports medicine, and conflicts of interest in medicine and research.
- **Community outreach:** CBH creates bioethics and health humanities programming that extends well beyond the university to engage health care professionals and citizens locally, regionally, and nationwide, including lectures, seminars, case studies and discussions.

Matthew Wynia, MD, MPH, FACP, has been director of the center since July 2015. Wynia is a national leader in health care ethics, having served as the head of the Institute for Ethics at the American Medical Association, president of the American Society for Bioethics and Humanities, Chair of the Ethics Section of the American Public Health Association and chair of the Ethics Committee at the Society for General Internal Medicine, among other elected and appointed positions. He is also recognized for his work in patient safety and quality after developing the AMA's Center for Patient Safety and he has served on National Academy of Sciences, Engineering and Medicine groups addressing team-based care, transdisciplinary professionalism, catastrophic disaster response, the use of public health methods in "countering violent extremism," evidence-based practices in public health emergency response, improving medical supply chain resiliency, and best practices for assessing morbidity and mortality in disasters. Wynia's research uses health services research methods to explore ethical issues in health care and public health policy. His training is in internal medicine, infectious diseases, public health and health services research. He is a professor in the Department of Medicine at the CU School of Medicine with a secondary appointment in the Department of Health Systems Management and Policy in the Colorado School of Public Health.

Therese Jones, PhD, is the associate director of the CBH and leads our educational and training programs. She is an associate professor in the Department of Medicine, Director of the Center's Arts and Humanities in Healthcare Program, Editor of the *Journal of Medical Humanities* and, in 2015, she published a landmark textbook for those who teach health humanities, *Health Humanities Reader* (Rutgers University Press). She is currently under contract with Routledge to publish an international volume, *Handbook of Media and Health*. She teaches required and elective humanities courses for health professions students; for undergraduate students who are enrolled in the Health Humanities Minor, a collaborative curriculum between the CU Anschutz Medical Campus and the CU Denver campus; and graduate students. She also serves as the lead on the development of our 12-credit hour Graduate Certificate in Health Humanities and Ethics (HEHE), which started in 2017 and now has enrolled over 50 students.

Other leaders in the Center's education and training work include **Daniel Goldberg, JD, PhD**, who is the co-leader of the certificate program and integrates ethics content throughout the new Trek Curriculum for the School of Medicine. He is also the associate director for Mentored Scholarly Activity in the Bioethics, Arts, Humanities & Education domain for the School of Medicine. He maintains an active research agenda in public health ethics, law/policy, and the history of medicine, and was the 2015-2016 Helfand Fellow at the New York Academy of Medicine. In 2019, Goldberg received a highly competitive \$150,000 grant from the Well Being Trust to study the effects of laws and regulations on structural stigma.

Jackie Glover, PhD, HEC-C, is a professor in the Department of Pediatrics and leads the center's work on clinical ethics case consultation. She serves as a lead ethics consultant for both the University of Colorado Hospital (UCH) and Children's Hospital Colorado and helps create shared educational, outreach, and research programs across the two hospitals and throughout their respective hospital networks. She is also director of the Humanities, Ethics and Professionalism Thread in the School of Medicine, which integrates bioethics and humanities content throughout the four years of the medical school curriculum. Other leaders of the center's clinical ethics work include **Karen Jones, MS, RN, HEC-C**, who is a clinical nurse ethicist, co-chair of the Children's Hospital Colorado Ethics Committee, and director of the hospital's Ethics Liaisons. **Brian Jackson, MD, MA, HEC-C**, is a critical care physician and co-chair of the Children's Hospital Colorado Ethics Committee. Brian was also a member of the question bank writing committee for the newly developed ethics consultation certification test of the American Society for Bioethics and Humanities. He and Jackie taught the first Clinical Ethics elective as part of the HEHE certificate in the fall 2018, again in 2019 and 2021. **Curtis Coughlin, MS, HEC-C**, is a genetic counselor and researcher who serves as a lead ethics consultant at Children's Hospital Colorado. **Dan Reirden, MD, HEC-C**, is an associate professor in adolescent medicine and the medical director of the TRUE clinic serving transgender patients and the HIV clinic and serves on the ethics consult service and **Heather Fitzgerald, MS, RN, HEC-C**, is a former nurse ethicist and new Director of Resilience, Ethics and Wellness at the Children's Hospital Colorado. Heather is again co-chairing the National Nursing Ethics Conference at UCLA and she has been appointed to the Advisory Board for ANA's Center for Ethics and Human Rights. **Kristin Furfari, MD**, is a hospitalist physician and a clinical ethics lead consultant at UCH and she and Jackie Glover serve as interim co-medical directors of the ethics consultation service. Kristin also is an associate director for medical student preceptorships as part of the Foundations in Doctoring course and the co-lead for the Health and Society Pillar in the new curriculum for the School of Medicine. **Megan Prescott, LCSW, HEC-C**, is a social worker with palliative care and also a lead consultant at UCH. Megan has developed and piloted a new online training program for moral resiliency. **Anne Dondapati-Allen, MDiv, PhD, HEC-C**, is the fourth lead consultant in the ethics consultation service at UCH. She is staff chaplain who does extensive work with staff resiliency. The center has the distinction of having eight out of our nine ethics consultants achieve the Healthcare Ethics Consultant Certification (HEC-C) from the American Society for Bioethics and Humanities, which was introduced in 2018.

Eric Campbell, PhD, is a professor of medicine and director of research at CBH. He joined the faculty of CU in April 2018. As director of research, he is responsible for building the research infrastructure of CBH. This includes hiring new faculty and research staff, fostering collaborations to facilitate research, creating a postdoctoral program for empirical researchers in bioethics and the health humanities, launching pilot grant programs, and creating a culture of research excellence in CBH. He maintains an active research program focused on empirical bioethics research at the intersection of health policy and bioethics. **Matthew DeCamp, MD, PhD**, is a practicing internist, health services researcher, and philosopher. He employs both empirical and conceptual methods to identify and solve cutting-edge problems at the interface of health care, policy, and bioethics. Special emphases of his research include engaging patients in health care organizational decision-making, ethical issues in the use of social media, big data, artificial intelligence, and global health (with a focus on short-term global health ethics; e.g., <http://ethicsandglobalhealth.org>).

He is an award-winning teacher and mentor, and has more than a decade of service on Institutional Review Boards. **Christine Baugh, PhD, MPH**, conducts interdisciplinary research at the intersection of health, policy, sport, and ethics. Much of her work has focused on the acute and chronic health implications of repetitive brain injury from sport, and the resultant individual, institutional, policy, and ethical considerations. She is the author of more than 50 peer-reviewed research articles and her work has been featured by leading media outlets including the *New York Times*, *Washington Post*, *ESPN* and *Sports Illustrated*. She has won numerous awards for her teaching and research, including being named to *Forbes* 30-under-30 list in sports. **Lisa Bero, PhD**, is internationally recognized for her work on evidence synthesis, bias, conflicts of interest, and use of evidence in decisions. She joined our research team as chief scientist in July 2020. She has developed and validated qualitative and quantitative methods for assessing bias in the design, conduct, and dissemination of research on pharmaceuticals, as well as tobacco, food, and chemicals. She has pioneered the utilization of internal industry documents and transparency databases to understand corporate tactics and motives for influencing research evidence. **Megan Morris, PhD MPH, CCC-SLP**, is an associate professor in the Division of General Internal Medicine in the Department of Medicine. She is a leading expert on the documentation of patients' disability status in the electronic health record and health care disparities experienced by patients with communication disabilities.

In the last year we:

- Wrote 35 new research proposals: 18 to the NIH and 17 to other funders
- Grew our total research portfolio to \$13,225,855
- Authored 22 articles based on original empirical research
- Built a network of collaborators across CU

Warren Binford, JD, EdM, joined CBH in July 2020. Warren is an internationally recognized children's rights scholar and advocate who is a frequent writer and speaker on children's issues, including 21st century forms of child abuse, exploitation, and neglect.

The CBH maintains an *Academic Leadership Council*, with one representative from each of the health professional schools and college on the CU Anschutz Campus appointed at 0.2 FTE to help lead CBH programs. These individuals serve a liaison role for their respective programs, ensuring the relevance and reach of CBH activities across all Campus programs, and they lead CBH initiatives in their particular areas of interest and expertise. 2020-21 members of the CBH Academic Leadership Council were Catherine Campisi, MSN, RN, PMHNP-BC (College of Nursing), Inge Wefes, PhD (Graduate School), Catherine Flaitz, DDS, MS (School of Dental Medicine), Morgan Unruh, DO (School of Medicine), Lisa Bero, PhD (Colorado School of Public Health), and Brett McQueen, PhD (Skaggs School Pharmacy and Pharmaceutical Sciences).

Finally, the center produces a number of programs to serve and engage key local, state and national communities.

- The CBH Art Gallery was closed for the 2020-2021 academic year due to the pandemic. Normally, the art gallery opens and displays four major exhibits each year featuring nationally recognized artists whose work explore health and healthcare related themes. Our last public spring 2020 exhibit, [Put Me Back Like They Found Me](#) by artist Daisy Patton opened on March 5 and was on display for only six days before the Art Gallery closed due to the pandemic. The exhibit, [now online on our website](#) with a video walk through of the work narrated by the artist, features embroidered portraits of girls and women who were victims of eugenic thinking, which continued to influence some health care practices even later in the 20th century. Patton's work centers on the stories of female survivors of forced sterilization in the United States. The gallery will open a new exhibit, *Stigma and Survival*, on September 16, 2021 by artist William Stoehr exploring themes of the opioid crisis and substance abuse disorder. The opening panel will feature Nora Volkow, MD, Director, National Institute of Drug Abuse, National Institutes of Health. Check [website](#) for gallery information. The approximate number of visitors to the Art Gallery since its opening in August 2012 is 66,295.
- In 2020-2021, the center hosted the *Intersections of Race, Class and Health Lecture Series*, made possible by the Henry and Janet Claman Endowed Visiting Professorship in the Medical Humanities and the Shivers Health Law Endowment. This series featured nationally acclaimed speakers such as journalist Harriet Washington, author of *Medical Apartheid*, physician-writer Damon Tweedy, MD, author of *Black Man in a White Coat: A Doctor's Reflections on Race and Medicine*, Jonathan Metz, MD, PhD, professor and author of *Dying of Whiteness: How the Politics of Racial Resentment Is Killing America's Heartland*, Dayna Matthew, JD, PhD, author of *Just Medicine: A Cure for Racial Inequality in American Health Care*, and others. This virtual lecture series featured eight events during the academic year and received over 5,000 RSVPs.

- In 2020-2021, the CBH compiled the 14th volume of *The Human Touch*, an annual edited volume of literature and visual arts on the human aspects of health and health care, with powerful works contributed by members of the Anschutz Medical Campus community, which will be [published online in September 2021](#). This publication is supported by a generous gift from Jeff Hill, MD, a School of Medicine alumnus, and his spouse, Molly Hill. In addition *The Curve*, a new special online edition of *The Human Touch* was launched in March 2020 in response to COVID-19. *The Curve* collected national and local submissions of creative/reflective writing and visual art for 12 months of the pandemic and [is now available as an online publication](#).
- Each year from 2016-2020, CBH collaborated with The Aspen Center for Social Values, the American Association for Physician Leadership, and other health organizations to produce the Aspen Ethical Leadership Program. This executive retreat brings together leaders from hospitals, health plans, and other health care organizations for 3three days of intimate discussions on ‘ripped from the headlines’ ethical and moral dilemmas confronting health care leaders. The 2020 program was cancelled due to COVID, but we are looking forward to the 2021 program with our new partner, the Colorado Health Institute. The 2021 program will explore themes of Equity for Individuals and Communities, Moral Injury and Workforce Wellbeing, and Future Tech and Data Ethics.
- The center’s Music and Medicine Initiative’s (MAMI) supports the CU Anschutz Orchestra and Choir. Normally these groups perform a fall and spring concert. While live performances were canceled for the 2020-2021 school year, they released the [‘Band Together’ Concert](#) in December, 2020. This concert, a special gift from the chancellor to the CU Anschutz community during the 2020 holiday season, brought the talent of the choir and orchestra together for a little magic to end a difficult year.
- The 2020-2021 Arts and Medicine Lecture Series hosted several virtual events. One featured filmmaker Neil Prose and his documentary, *Keepers of the House*, about the critical role environmental service workers play in emotional support of health institutions. Another lecture featured center faculty member Warren Binford JD, EdM and her children’s book *Eschucha Mi Voz* on the stories of children detained at the border. Each event attracted 250-350 RSVPs. In addition, we also co-hosted an additional eight events with the Colorado Resiliency Arts Lab (CORAL) which each attracted an average of 125-225 RSVPs. Check our [past events](#) page for the full list.
- Under the leadership of Jackie Glover, PhD, HEC-C, and Jean Abbott, MD, MPH, our faculty offer education and training programs to individuals and ethics committees at hospitals and other care delivery organizations around the state.
- Karen Jones, RN, MS, HEC-C, and Jackie Glover, PhD, HEC-C, made major contributions to the Moral Distress and Resiliency site that is part of the CHER effort (Colorado Healthcare Ethics Resources) for COVID. <https://cohcwcovidsupport.org/>
- For the 2020-2021 season, faculty member Jackie Glover, PhD, HEC-C transitioned the monthly Ethics Grand Round series to the virtual realm, producing nine online events attracting 100-300 RSVPs each, from across the region. Ethics Grand Rounds are co-sponsored by UHealth and addressed topics such as caring for transgender patients, scarce medications, COVID Research, intimate partner violence, and others. For the full list and event recordings, visit our [Ethics Grand Rounds](#) webpage.
- The center partnered with CU Boulder Radio 1190 to begin production of Season Two of the *Hard Call*[®] podcast series. This new partnership produced several episodes in a new series, *COVID Quandaries*, which explore ethical issues raised by the pandemic. Across the two seasons, the *Hard Call*[®] podcasts exceed 20,000 plays worldwide. The top 10 countries with the most listeners are the United States, Canada, Australia, United Kingdom, India, Ireland, Singapore, Germany, Mexico, and Uganda. Listen at: hardcallshow.org or iTunes, Google Play and other major podcast hosting platforms. Selective *Hard Call*[®] episodes have also been adapted into educational modules to be used in CU ethics curricula across the CU campuses.
- Center faculty including Center Director Matt Wynia, MD, MPH have been busy answering questions from the press about COVID, triage, reopening, medical marijuana, stigma, conflicts of interest, and the role of Nazi doctors in the Holocaust. See our faculty’s 80+ media appearances in our [newsroom](#).
- With support from Heather Fitzgerald, MS, RN, HEC-C, and Jean Abbott, MD, MH, the center teams with the Colorado Healthcare Ethics Forum (CHEF) to offer an annual two-day clinical ethics education program for area clinicians and ethics committee members. The 2020 program was canceled due to COVID. A series of four free webinars was offered throughout the year instead, exploring topics such as first responders and mental health, public guardianship, and vaccine equity in rural areas. The center’s outreach pillar lead, Meleah Himber, MEd, serves on the CHEF Board as Secretary.
- In spring of 2021, CBH held the fifth annual [Holocaust Genocide and Contemporary Bioethics](#) program commemorating the involvement of health professionals in the Holocaust and other genocides. The program takes place annually in April during the Days of Remembrance and is supported by the William S. Silvers endowment in collaboration with many local philanthropic and educational organizations

The 2021 program was virtual with the theme *Then and Now: Courage, Complicity and Compromise* and featured keynotes Rebecca Carter-Chand, PhD, director of programs on Ethics, Religion and the Holocaust at the *US Holocaust Memorial Museum*, Susannah Sirken, MEd, director of policy and senior advisor at *Physicians for Human Rights*, and Tessa Chelouche, MD, co-director of the *Maimonides Institute of Medicine, Ethics and the Holocaust* and co-chair of the Department of Bioethics and the Holocaust at the UNESCO Chair of Bioethics. In addition, the program hosted a virtual International Remembrance Day lecture on the history of Nazi doctors during the Holocaust and its impact on ethics today and an international panel discussion on teaching the Holocaust in the health professions. The combined events received over 2,000 RSVPs with the international panel discussion drawing 866 attendees from 27 countries. Silver Sponsors for the extended 2020-2021 sponsor season were JEWISHcolorado and the Rose Community Foundation.

- Throughout 2021-2021, the center maintained a COVID Resources and Recommendations webpage with resources to highlight articles and resources that address ethics and health humanities issues that are salient to health care workers, policy makers, and public health professionals. This page was updated on a rolling basis per the recommendations of CBH faculty, staff, and affiliates.
- In a new partnership with the Colorado School of Public Health's Center for Health, Work & Environment (CHWE), in 2020-2021 we hosted [Work and Play in a Pandemic: Ethics and Occupational Health](#), a webinar series of five episodes discussing facets of the COVID-19 pandemic that intersect workplace health and safety and ethics. Topics included COVID-19 and collegiate athletes, at-risk minority workers, and OSHA regulations. The series attracted over 2,000 RSVPs across all events, and for this collaboration [CBH was named the 2021 "Partner of the Year" by CHWE.](#)
- In a new partnership with the Denver Museum of Nature and Science, Center Director Matt Wynia, MD, MPH, participated in several webinars regarding ethical issues around COVID as well as a webinar on mistrust in science. In addition, we held an evening public webinar on the [ethical dilemmas of technological advances in gene editing](#) with national experts moderated by Colorado Public Radio health journalist John Daley. This partnership opened access of the center's work to a wider public audience. Full programs [are posted on the CBH website.](#)

www.coloradobioethics.org

Colorado Center for Personalized Medicine

The Colorado Center for Personalized Medicine is a multi-institutional collaboration that links extensive electronic medical record data to 'omics' information to promote the development of tools and knowledge in biomedical informatics in order to expand prognostic and diagnostic capacity using molecular diagnostics. The primary objective is to apply personalized medicine research, education, and clinical care across diseases to accelerate the development and application of personally tailored prevention, diagnosis, and treatment techniques. These efforts serve the center's overarching goal to integrate personalized medicine into our routine health care to improve the lives of our patients.

Center accomplishments this past year

- Pivoted to address campus needs at the start of the COVID epidemic and established a high-throughput clinical diagnostic assay for SARS-CoV-2 virus with which we performed over 100,000 tests.
- Held the 4th annual CCPM retreat in virtual format.
- Developed and administered COVID-19 survey to 180,000 Biobank participants (June 2020 – April 2021) and have gathered roughly 22,000 responses to date.
- Re-consented ~20,000 participants for return of results.
- Updated and expanded pharmacogenomics (PGx) clinical decision support (CDS) tools across the UHealth system for 10 medications (clopidogrel, voriconazole, citalopram, escitalopram, clobazam, brivaracetam, omeprazole, pantoprazole, lansoprazole, and dexlansoprazole).
- Developed and deployed a HIPAA-compliant cloud-based high-performance computing platform to replace CCPM Rosalind.
- Developed Colorado Biobank Portal application to explore CCPM Biobank GWAS analysis summary, which is currently undergoing testing prior to rollout to the campus community.
- Processed and quality-controlled a total of 1,051 samples received from the EMSB for the COVID epigenetics project and housed and inventoried 791 additional samples received from the EMSB.

Plans for the coming year

- Conduct and complete a national search for a new director of CCPM.
- Make operational and process improvements to support our core mission of applying personalized medicine research, education, and clinical care across diseases to accelerate the development and application of personally tailored prevention, diagnosis, and treatment strategies.
- Implement a workflow for the clinical annotation of variants in the first ~35,000 exomes from our partnership with Regeneron.
- Establish strategies for the return of results for PGx genes beyond CYP2C19.

Key Components of the Center

Biobank

Overview: Generate genetic data to advance research, discovery, and clinical implementation

Accomplishments over the past year

- Biobank sample processing to date
 - 47,087 samples received
 - 32,489 accessioned
 - 32,189 DNA extracted
 - 30,537 genotyped
- Established high-throughput clinical diagnostic assay for SARS-CoV-2 virus. Performed over 100,000 tests.
- Successful compliance with all CAP proficiency testing.
- First laboratory in Colorado to receive College of American Pathologists (CAP) accreditation under the Biorepository Accreditation Program. We also achieved CAP accreditation under the Laboratory Accreditation Program.
- Expanded staffing to include a laboratory manager and two additional laboratory technologists. Team consists of Laboratory Director, Clinical Laboratory Manager, and six laboratory staff.
- Implemented core features of the Laboratory Information System.

Plans for the coming year

- Implement additional features of the Laboratory Information System.
- Extract and ship DNA samples for Regeneron Devise and implement workflow for the clinical annotation of variants in the first ~35,000 Regeneron exomes.
- Continue to return pathogenic and likely pathogenic findings for actionable genetic conditions (e.g., *BRCA1*-related hereditary breast and ovarian cancer syndrome).
- Work with interim CCPM Director Casey Greene on key initiatives (e.g., microarray genotyping versioning, software decisions supporting return of results).

Clinical Operations

Overview: CCPM clinical operations refers to all operational aspects of patient recruitment, sample collection, patient and provider education and engagement (i.e., marketing), and coordination of activities between the clinical environment (hospital, clinics) and the CCPM Biobank to support the return of results to patients. Starting in FY2022, this will be expanded to include additional 'omics, predictive algorithms, and EHR-based decision support applications to personalize care for UCHhealth patients.

Accomplishments over the past year

Biobank participation:

- Consented an additional ~30,000 participants (~180,000 total).
- Collected additional 27,000 samples (~90,000 total).

- Continued quarterly newsletters to all Biobank participants via email.
- Began transition to joint web and engagement presence with UHealth marketing.
- Developed and administered COVID-19 survey to 180,000 Biobank participants (June 2020 – April 2021); 22,000 responses to date.
- Re-consented ~20,000 participants for return of results.
- Resumed return of incidental findings of high-risk genes via virtual visit model.
 - Total 20 identified, 13 returned, 25 more pending.
- Established telemedicine/telehealth/virtual visit clinical services as next major initiative for results return.
- Developed curriculum for engaging providers in person, virtually, asynchronous on-line learning.
- Hired a full- and a part-time clinical research coordinator.

Plans for the coming year

- Enrollment:
 - Increase overall enrollment (1.5 million prospective participants).
 - Close gap between consent and sample collection (current overall 50%).
 - Targeted enrollment in specialty clinics (transplant, psychiatry, behavioral health, acute medicine, primary care, cancer center).
 - Increase diversity of participant population.
 - Continue efforts to re-consent participants for return of results.
- Education: provide Biobank updates and education around return of results to providers and clinical staff at primary care and specialty care forums across UHealth; update patient and provider education materials on website; continue dissemination of newsletters, patient information sheets.
- Patient advisory committees: optimize contribution/involvement of UHealth Patient Family Advisory Council (PFAC); establish new advisory group with diverse representation of Biobank participants.
- Engagement/surveys: administer health survey to (prospectively) enrolled participants to supplement clinical data in EMR.
- Marketing – collaborate with UHealth to create more coherent participant experience.
 - UHealth.org: Target prospective participants
 - ⇒ Recruitment
 - ⇒ Consent/enrollment
 - ⇒ Sample collection
 - CUAnschutz.edu
 - ⇒ Enrolled participants
 - Additional studies/surveys
 - Self-education
 - ⇒ Clinical resources for providers
 - ⇒ Academic research collaboration opportunities
 - ⇒ Prospective industry partner info (with CU Innovations)
- Clinical services
 - Interpretation of commercial genetics panels
 - Guidance regarding selection of genetics screening panel
 - Biobank results
 - Direct-to-consumer tests (e.g. 23andMe, Ancestry.com)
- Select future clinical genotyping platforms and develop IT pipeline to return results to Epic
 - Targeted microarray
 - Next-generation sequencing
- Program Evaluation: complete and begin implementation of evaluation plan for return of results (PGx and non-PGx)

PGx

oUpdated and expanded PGx clinical decision support (CDS) tools across the UHealth system for 10 medications (clopidogrel, voriconazole, citalopram, escitalopram, clobazam, brivaracetam, omeprazole, pantoprazole, lansoprazole, dexlansoprazole).

⇒PGx CDS tools have alerted in the clinical setting for 94 distinct Biobank participants, for a total of 107 drug-gene interactions (~77% PPIs, 21% SSRI, 2% clopidogrel).

⇒~10% of prescribing decisions for new medications or active meds/refills were likely influenced by PGx warnings.

⇒~44% of prescribing decisions were likely influenced by PGx warnings when the analysis is limited to *new medications* only.

⇒Clinician feedback: UHealth Metro Primary Care Physician on the SSRI PGx warning – *“Just saw this alert on my patient. It was excellent – clear, easy to read and follow. AND it changed our plans.”* – September 2, 2020.

oBuilt PGx CDS tools for two new drugs

⇒Simvastatin/*SLCO1B1* (est. go live Dec 2021)

⇒5-fluorouracil/capecitabine/*DPYD* (est go-live 2022)

oCompleted the clinical evidence review and detailed evaluation of 78 additional drug-gene pairs, in preparation for future genotyping platforms.

oTo date, we have conducted over 150 stakeholder meetings to socialize the PGx initiative, obtain feedback on the PGx CDS tools, and annually reevaluate our existing CDS tools and processes.

oEstablished a partnership with the UHealth System Pharmacy Department, to enhance support of the CCPM/ UHealth PGx program by collaborating on gap analysis, partnering in revision and dissemination of education tools for new and existing drug-gene pairs, and increasing overall involvement in the program.

oIn collaboration with the UHealth Pharmacy Department, disseminated a systemwide survey to pharmacists to identify educational gaps related to PGx and the CCPM Biobank initiative.

oCompleted the development of a detailed implementation science-based evaluation plan in collaboration with ACCORDs.

oParticipated in four IGNITE Pharmacogenomics Network research studies, resulting in the following co-authored publications

⇒Prescribing prevalence in pediatric patients of medications with potential genotype guided dosing. Ramsey LB et al, JAMA Netw Open. 2020 Dec 1;3(12):e2029411. PMID: 33315113.

⇒Opportunity for Genotype-Guided Prescribing Among Adult Patients in 11 U.S. Health Systems. Hicks et al, Clin Pharmacol Ther. 2021 Jul;110(1):179-188. PMID: 33428770.

⇒Multi-site investigation of strategies for the clinical implementation of preemptive PGx testing. Duarte et al, Genet Med. 2021 Jul 19. Online ahead of print. PMID: 34282303.

⇒Multi-site evaluation of institutional processes and implementation framework characteristics for pharmacogenetic testing to guide antidepressant therapy. Tuteja et al, Clin Transl Sci, 2021, in press.

oSubmitted two research grants

⇒AHRQ R21 (Aquilante/Kao) – PGx CDS interoperability (not funded).

⇒ALSAM Skaggs Scholars Program Grant (Aquilante/Kao) – Clinical Integration of PGx in Rural and Underserved Communities (funded).

oNotable national/international presentations

⇒IGNITE Network Virtual Meeting, January 2021

⇒Netherlands Precision Medicine Network Annual Symposium, March 2021

⇒National University of Singapore, July 2021

Plans for the coming year

o In collaboration with the Return of All Results Committee, the Biobank Laboratory, and the CCPM Clinical Operations Team, resume return of results for *CYP2C19* and begin return of results for a new PGx gene, *SLCO1B1*. Please note – this outcome is dependent on our IT vendor, BC Platforms, meeting their deadlines for deliverables.

oIn collaboration with the UHealth IT team and the CCPM Clinical Operations Team, implement the Epic Genomics Module.

oConvert existing PGx tools to the Epic Genomics Module functionality.

oTransition to a more scalable PGx CDS development framework by instituting a drug-gene pair prioritization tier structure and using Epic Genomics Module CDS functionality.

oContinue to build and turn on PGx CDS tools for clinically actionable medications, thus expanding the clinical reach of our initiative into new therapeutic areas (e.g., oncology).

- oBuild PGx CDS tools in Beacon (Epic’s Oncology Module) for relevant non-oncology medications (e.g., PPIs).
- oBegin implementation science-focused evaluation process for high-impact drug-gene pairs with >50 alerts.
- oin collaboration with CCPM interim leadership and the Biobank Laboratory, identify genomic platforms (e.g., GDA, WGS) and IT vendors to enable future clinical return of PGx results, beyond the MEGA chip.
- oin collaboration with Health Data Compass, conduct a large-scale CCPM Biobank PGx Landscape Research study to characterize prescribing patterns, including geographic regions, of actionable PGx medications at UHealth (study already approved by COMIRB). Use this information to inform Biobank enrollment activities and future PGx implementation work.
- oSubmit a manuscript(s) describing the frameworks we have developed for our drug-gene pair prioritization work and PGx CDS development and evaluation activities.
- oDevelop patient and clinician PGx consult services to support and enhance the PGx implementation initiative. The patient PGx services will mirror those we are already conducting under the auspices of the UCH Patient Coordinated Services Clinic.
- oThrough extramural grant funding and potentially industry partnerships, expand the scope of our PGx efforts, with a focus on 1) CDS interoperability, and 2) clinical informatics-facilitated PGx in rural and underserved settings.
- oThrough collaborations with pharmaceutical outcomes researchers, begin to evaluate the health economics and outcomes of preemptive genotyping at scale in a large healthcare system.
- oContribute to national PGx networks to foster research and implementation advancements in the field.

Health Data Compass

Overview: Health Data Compass is a shared, multi-institutional resource of integrated data and analytic services designed to transform data-driven processes in clinical research, operational excellence, molecular discovery, and precision medicine. We achieve this by maintaining a comprehensive, scalable, data integration and management system, providing analytic infrastructures, and fostering forward-thinking approaches to technological solutions. In September 2020 Ian Brooks, PhD, joined as associate director, becoming interim director in December 2020, and permanent director in May 2021. Brooks halted or modified several ongoing projects that were missing milestones/planning or faced budget constraints. Brooks has focused on upgrading the Compass engineering and data delivery teams and services with a narrower focus on self-service tools; data governance; and data security and compliance. Compass goals are closely aligned to stakeholder institutional expectations, and responsive to campus needs reflected through CCPM, in collaboration with the Center for Health AI and the Office of the Chief Research Informatics Officer.

Previously listed Accomplishments over the past year, with notes

- Roll out a fully statistically deidentified UHealth research dataset.
 - o*On hold: originally intended for the BCPlatforms “BC|Link” service this project was put on hold due to lack of project planning, data governance, and consensus support from stakeholders.*
- Free-text clinical note deidentification and targeted term extraction on targeted clinical notes.
 - o*DLP – originally proposed; put on hold due to lack of project planning, data governance, and consensus support from stakeholders.*
 - o*NLP: More successful approach, although a deep dive on GCP solutions proved them to be too expensive for general academic use. We are exploring other options with the CRIO Office.*
- HIPAA-compliant geocoding of patient addresses.
 - o*Complete.*
- Add social determinants of health third party data, images, physiological signals.
 - o*Complete/In Progress*
 - ⇒*SDoH data is imported and undergoing governance rule development and other documentation steps.*
 - ⇒*Images: Compass is working with SOM-OIT to host Flywheel DICOM research technology.*
 - ⇒*Physiologic Signals: Proof of Concept with UHealth ventilator data is underway.*
- Add CDPHE state immunization registry, Colorado state cancer registry.
 - o*Halted for a gap analysis against current CUA data assets.*
- Incorporate cloud-based high-performance computing platform to replace CCPM Rosalind.
 - o*Complete. HIPAA compliant high performance computing environment is running in Compass Cloud.*

- Migrate on-premise bioinformatics tools (BC Platform) to HDC cloud.
 - *Complete from the standpoint of Compass hosting these services. Software implementations not all complete; this project is no longer managed by Compass.*
- Expand existing HDC educational workshops into cloud-based analytics.
 - *Cancelled. No educational needs analysis was performed; goal ill-defined.*
- Continue expanding capabilities in Eureka Release 4.0, focus on expanding AI/Machine Learning infrastructure to support novel AI-based modeling.
 - *Project has pivoted to produce a more user-friendly, stable and cost-effective R/Python system, due 2022.*
- Expand self-service tools, including pre-approved deidentified self-service data extraction – deploy ATLAS and Leaf.
 - *In progress.*
- Expand technical relationship with Google Cloud Platform health care and life sciences teams via joint technology projects and presentations.
 - *Blog post focused on data ingestion and data management in GCP.*
 - *Kahn and Brooks engaged with multiple GCP partners & pending partners on the benefits of cloud computing for academic & healthcare.*
 - *Brooks did a GCP/BCPlatforms sponsored presentation on cloud genomics.*
 - *Compass Engineering team engaged with GCP to redesign data ingestion process.*
 - *Compass is engaged with GCP on a novel FHIR-OMOP data project for a CDC sponsored public health surveillance project.*

Plans for the coming year

Multiple high-value initiatives exist for FY22 focused on improving data security and compliance, data governance, and data engineering. Many of these are process improvements and do not have an encapsulated deliverable. These efforts are often performed in collaboration with, or under the advisement of the CRIO and the Office of Research Compliance. Engineering projects with specific deliverables of note for FY22 include:

- Self-Service: Leaf data viewer as a self-service data searching tool, coupled with training programs, self-service staff support and online documentation, and data dictionaries. Leaf will provide secure & auditable, HIPAA-compliant access to de-identified and limited-data sets for research.
- Self-Service: ATLAS OMOP data browser – this is a more advanced tool allowing informaticians and data scientists with experience in the OMOP data model to query data. Full support and documentation will be provided.
- Enterprise change management: OS Ticket – project and user management system providing enterprise support to users and audit trails for change management of the Compass Google Cloud.
- Cloud Enterprise Security & Compliance: BCE & SCC – these are critical security tools to track non-normal user behavior (indicating potential identification compromise) as well as data fidelity.
- HL7 data ingestion: MLLP – a software pipeline allowing ingestion of HL7 data sources (e.g. physiological device data such as ventilator settings). Appropriate governance and data security is in development.
- Research Imaging: A proof-of-concept Flywheel research imaging system in Compass Cloud as a service for, and in collaboration with, the School of Medicine Office of Information Technology. This is in collaboration with CHCO.

Translational Informatics Service (TIS)

Overview: TIS pursues three objectives: 1) to support CCPM clinical and research operations; 2) to disseminate knowledge generated by CCPM and provide education; 3) to perform translational research.

Operations: TIS provides informatics pipelines for return of genetic results for clinical decision support, performs quality control and analysis of genotyping data from the Biobank, runs analyses and distributes data to university researchers, and handles operational requests from CCPM industry partners.

Dissemination of knowledge: The Colorado Biobank Engine (CBE) is a flagship application currently being developed by TIS, which will provide access to the results of association studies generated by TIS for ~ 50 million genetic variants and 1368 phenotypes. The CBE uses graphics user interface and does not require knowledge of informatics from the user. Tzu Phang, PhD, leads education of researchers and scientists in genomics and electronic health records data analysis methods, Biobank, and personalized and genomic medicine.

Innovation: TIS works in close collaboration with Compass and Polygenic Risk Score group led by Chris Gignoux, PhD, to identify and explore clinically relevant questions that can be answered using Biobank genetic data and clinical data in Compass. TIS implements methods and tools for genetic and clinical data analysis. The long-term goal of the innovation arm of the TIS is to transform CCPM expertise and data into translational and clinical research within the university as well as partnerships with biomedical industry.

Accomplishments over the past year

- TIS human research protocol has been approved by COMIRB.
- Processed, performed quality control, and imputed genotyping data generated by the CCPM Biobank. The most recent imputed dataset contains data for ~50 million variants for ~ 34,000 Biobank participants. This data freeze is available to university and UHealth researchers through the Access to Biobank Committee (ABC).
- Delivered data for research projects for university faculty in collaboration with ABC and Colorado Anschutz Research Genetics Organization (CARGO)
- Migrated data from the Rosalind, an on-premises supercomputer, to the HIPAA-compliant Google cloud infrastructure. Migrated TIS bioinformatics pipelines for GWAS, polygenic risk computation, next generation sequencing data processing, and others to the Google cloud high performance compute infrastructure.
- Implemented, tested, and operationalized two state-of-art genome wide association study (GWAS) pipelines SAIGE and REGENIE.
- Launched TIS website <https://medschool.cuanschutz.edu/ccpm/tis>
- Established workflow for cohort exploration requests for the Biobank clinical data (<https://redcap.ucdenver.edu/surveys/?s=7NNHFL4RET>) and completed 34 requests from researchers and industry partners.
- Taught GWAS Analysis Workshop (instructor Tzu Phang, PhD) in April 2021.
- Performed GWAS for 1368 clinical phenotypes using genetic data in CCPM Biobank.
- Established online database to store ~ 60 billion summary statistics from CCPM Biobank GWAS analysis.
- Developed Colorado Biobank Portal application to explore CCPM Biobank GWAS analysis summary (currently undergoing testing).
- In collaboration with Health Data Compass and BC|Platforms launched BC|Rquest application ([BCRQUEST.com](https://bcplatforms.com/BCRQUEST.com)) that permits pharmaceutical industry researchers to explore and request de-identified clinical and genetic data from the CCPM Biobank participants.

Plans for the coming year

- Perform quality control and imputation for whole exome sequencing data scheduled for delivery by the Regeneron Genetics Center in October 2021.
- Incorporate whole exome sequencing data into CCPM Biobank genetic data freeze.
- Perform GWAS analysis for ~ 1600 clinical phenotypes using aggregated microarray and whole exome sequencing data.
- Query whole exome sequencing data for clinically actionable variants for return to patients and clinical providers.
- Continue to collaborate with the CCPM Biobank on developing informatics pipelines for the return of genetic data for clinical care, which may include supporting existing collaboration with BC|Platforms and/or developing homegrown solution for clinical return of genetic results.
- Complete testing, establish access policies and access management for the Colorado Biobank Portal application. Make GWAS summary statistics available to University of Colorado and UHealth researchers through the application graphical user interface.
- Operationalize bioinformatics pipelines for the polygenic risk score computation such as LDpred2. Work on other relevant bioinformatics analysis such as burden tests, copy number changes, expression quantitative trait loci etc.
- Continue fulfilling cohort exploration, genomic data analysis, and data delivery requests from researchers and industry partners in collaboration with the Health Data Compass, ABC, and Biobank.

The Colorado Anschutz Research Genetics Organization (CARGO)

Overview: CARGO was established to be a versatile service core that assist researchers performing studies in molecular biology, biotechnology, and genotyping. We provide high quality, reproducible, economical research services to the internal and external scientific community in the Anschutz Medical Campus.

Accomplishments over the past year

- Optimization of the strategic plan and training of all staff to ensure the CARGO facility is both scientifically and technologically competitive, cost efficient, and sustainable.
- Continued to expand on our expert advisory committee to provide well-informed input on strategic decision making and customized project planning.
- Utilized funds to hire new staff, new equipment, proper tools, and technology to enhance and optimize core services in alignment with our strategic mission.
- Improved on the marketing and accessibility of the core facility by the creation of a new live website with information regarding the core facility, points of contact, and services.
- Expanded services to include and collaborate with internal and external investigators, other core facilities and outside organizations.
- Continued to serve as a demo site for companies including TECAN and Autogen to educate internal and external investigators in the mid-west (*e.g.* Fluid handling and normalization, nucleic acid extractions).
- Processed and QC' d a total of 1051 samples received from the EMSB for the COVID epigenetics project.
- Housed and inventoried 791 additional samples received from the EMSB, extracted in the CCPM biobank for COVID epigenetics project.
- Performed epigenetics on a total of 917 samples including COVID negative, positive, recovered subjects and an interesting group of subjects with other respiratory viral infections.
- Continued research efforts with the CU COVID-19 Epigenetics research projects (DNA extraction, bisulfite conversion, methylation, and genotyping).
- Continued collaborating with Illumina on running custom methylation arrays developed by their team (N2T arrays) and understanding epigenetic signatures in COVID subjects.
- Offered expert guidance and estimates for the service of interest to many investigators who prepared NIH grant applications, most being our existing customers.
- Partnerships and mentorships with Aurora Public High School (Junior and senior level minority students).

Plans for the coming year

- Offer training opportunities for faculty, staff, and students.
- Partner with CCPM, Aurora Public schools and Aurora community college to offer training for disadvantaged and undergraduate students.
- Optimize a strategy to address challenges and solutions to enhancing efficiency, sharing and collaborative efforts.
- Continue to serve as a demo site, partnering with other companies in the field to improve on professional development and increase knowledge of technological innovation.
- Collaborate with additional experts to further optimize decision making and project planning.
- Offer a wider range of customizable nucleic acid extractions and genotyping arrays.
- Offer additional fluid handling services for sequencing cores (automated library prep).
- Continue to partner with internal and external CU community in the design and execution of their projects.
- Develop a core strategic plan that can help CARGO facilitate coordination with other core facilities.
- Create an optimized model for financial management.
- Development and validation of COVID-19-associated epigenetic signatures.
- Continue collaborating with Illumina to explore and understand benefits of data generated from their custom viral detection arrays for COVID subjects.
- Continue to work and discuss new developments and incentives with top companies like Illumina, Qiagen & TeCan as the surge in COVID cases continues.
- Continue to work closely with the drug lab and develop a library prep protocol utilizing TeCan Fluent and D300.

Personalized Ancestry Information Resource (PAIR)

Overview: PAIR serves as a resource to CCPM and the wider Anschutz community to leverage ancestry (from global to fine-scale to relatedness) in biobank discoveries and serve as a portal for disparity-focused research. PAIR will additionally provide an ancestry product for the Biobank.

Accomplishments over the past year

- Began analyses on the second official freeze of CCPM Biobank genotype data (~34,000 participants). PAIR serves as alpha testers and first-line users for data QC and rollout pipelines developed by Translational Informatics Services (TIS). PAIR Instructor Jonathan Shortt, PhD, contributed relevant metadata to TIS necessary for biobank use both within and outside CCPM. Working closely with TIS on research data availability and access.
- PAIR head and CCPM Director of Research, Christopher Gignoux, PhD, led development of a research plan (with TIS and Wiley) to perform primary analyses for the initial CCPM-wide manuscript using COMPASS billing code data to describe CCPM broadly and be an initial read for investigators on campus interested in CCPM.
- Began analyses to uncover high resolution genetic communities using identity-by-descent haplotypes shared between CCPM participants. These analyses are expected to yield insights into the unique populations present in CCPM that are not present in publicly available genetic datasets and whose population structure and history have not been previously characterized in depth.
- 4 new grants funded, including a NHGRI U01 specifically focusing on understanding genetic architecture in diverse populations, thereby relying heavily on PAIR insights. The PAGE consortium linking health systems with research cohorts and DTC companies to predict genetic risk in globally diverse populations across >20 studies, now has had their first annual meeting with another scheduled mid-September 2021.
- Developed close collaboration with the Cancer Center to work towards leveraging PAIR knowledge to develop more opportunities in cancer disparity research at Anschutz. Supplied relevant CCPM information for the Cancer Center renewal. Cancer Center supplement awarded to bridge PAIR insights with Cancer Center initiatives, to develop an internal funding mechanism to encourage pilot proposals from collaborative groups across the Cancer Center and CCPM.
- Developing a resource for CCPM (and therefore all of campus) to bridge genetic risk scoring information with PAIR ancestry variables, given how tightly linked the two components are. This allows us to both develop a greater understanding of health disparities in CCPM participants and provides an understanding for how one could administer clinically relevant risk models across the diverse populations represented in the CCPM biobank. Currently building a resource in collaboration with TIS to understand >600 risk scoring models and their impact on ~1300 phenotypes derived from ICD-10 codes. Leading efforts towards identifying clinical implementation opportunities for these risk models as part of a new working group involving individuals from CCPM, CHAI, and the math/stats department downtown.
- Collaborating with TIS on efficient risk scoring pipelines both within CCPM and in collaboration with our network. Currently the pipeline has been adopted by researchers at UNC, UCLA, Mt Sinai, and others.
- Applied global ancestry analysis pipeline to the first ~34,000 genotyped CCPM participants. The global ancestry analysis is based on broad global populations from publicly available high-quality genetic datasets, and calibrated with extensive simulations. Global ancestry, along with maternal/paternal haplogroups and Neanderthal ancestry, is expected to be one of the core features in the first version of the CCPM ancestry product.
- Continued leading efforts with other CCPM researchers using electronic health records (EHR) and genotypes (where possible) of CCPM Biobank participants and UHealth patients to study COVID-19 severity risk factors. In this research, Gignoux serves as a primary investigator, co-leading the COVID-19 working group, and was the Anschutz lead (also involving Shortt) in the global meta-analysis of COVID-19 genetic risk factors, published in June in *Nature*.
- Betzaida Maldonado, HMGGP student, joined the group full time. Betzaida and Jason Wilson both rotated in the group during the year. Betzaida is the third full-time student to join the group along with Katie Marker (3rd year HMGGP student), and Evan Sticca (4th year HMGGP student). NIA F99/K00 scholar Esteban Lucero, recent graduate of the HMGGP program, is joining the group.
- Continued monthly joint lab meetings with Matthew Keller and Luke Evans at the Institute for Behavioral Genetics in Boulder, with multiple NIH and ABNexus proposals submitted involving CCPM and Boulder investigators.

- Gignoux served as sponsor and mentor for several CCPM members: F32 application for Harrison (Norman Lab), K08 application for Lazorwitz (Ob-Gyn, CCPM). Planning in the next year for K99 applications.
- Published manuscripts involving PAIR data in collaboration with faculty in BIPM, Dermatology, and OB-GYN.
- Gignoux is continuing to serve on the NHGRI Complex Disease Working Group and new task force advising the NHGRI/EBI GWAS Catalog team. Sat on multiple NIH study sections as an *ad hoc* member. Numerous committees on campus including SIRC, Global Health Program; HMGGP retreat and seminar committees; CCPM Executive Committee, BIPM Executive committee, CCPM Biobank Access Committee (now Director), CCPM Biobank Operations, CCPM Seminar Organizer in FY20. Course Director for Evolutionary Genomics, contributor to survey courses for HMGGP and MSGC programs.

Plans for the coming year

- New postdoc hire for joint CCPM/Million Veteran Program research initiatives, as well as an additional hire whose primary focus will be PAIR-related research.
- Preliminary PAIR product rollout across first ~34,000 participants (comprising first two official freezes of genotype data) in the Biobank.
- Release three flagship CCPM-focused papers: our initial report focuses on the development of CCPM and initial genotyping results, as well as a manuscript with an in depth focus on genetic ancestry of the first 34,000 genotyped CCPM participants, and genome-wide association studies across major disease and trait billing codes for the first ~34,000 participants in the Biobank in collaboration with TIS, Compass, and other operational units in CCPM. Submit the initial description of genetic risk score modeling across ancestries from our resource, both as a resource for us and so others can use the risk models easily.
- In collaboration with TIS, develop best practice methods for quality control of exome data and integration with previously genotyped participants.
- Lead COVID-19 severity and susceptibility investigations using CCPM biobank data and UHealth EHR data obtained through Compass (collaboration with Johnson, CCPM). Current investigations on vaccine reactions, development of long haul symptoms, and continued monitoring how our associations remain or change with the Delta variant.
- Continue to work with other groups (regulatory & operations) to develop appropriate access to ancestry results outside of the clinical/medical domain.
- Continue to develop algorithms and contribute to publications, including novel algorithms to harness relatedness information relevant to clinicians and researchers alike. Submit our paternal ancestry algorithm, SNAPPY, for publication.
- Present results as posters and talks within the Anschutz community, and at major international meetings as travel to and participation in such meetings resumes.
- Work with education team in CCPM to develop genetic ancestry materials relevant to CCPM participants, including developing genetic risk scoring slides for the Personalized Medicine Certificate program.
- Outreach: continue to contribute to the CCPM newsletter (Discover), provide slides and materials, contribute to additional focus groups.
- Continue to serve on same national and local committees/working groups. Course Director (Gignoux) and guest lecturer (Shortt), Evolutionary Genomics, Fall 2021. Continue to develop and contribute course materials and lectures to education team for use in the Personalized Medicine Certificate program.

Education

Overview: A core mission of the CCPM is to provide personalized medicine education to current and next-generation health care professionals, scientific researchers, and the community.

Accomplishments over the past year

- Provided educational sessions to all second- and third-year Internal Medicine residents as well as fourth-year Psychiatry residents.
- Continued provider education through Grand Rounds and faculty meetings to various departments on campus.
- Completed development of and began marketing for Graduate Certificate Program in Personalized & Genomic Medicine with first class offerings to begin January 2022.
- Created return of results educational modules for pharmacists affiliated with CU.
- Developed educational materials for non-pharmacogenetic biobank return of results.
- Developed and piloted Genome Wide Association Study (GWAS) workshop for researchers and clinicians.
- Evaluated and revised educational materials for pharmacogenetic results related to two genes and eleven distinct medications.
- Piloted and subsequently revised a four-hour online course in personalized medicine for graduate medical trainees and practicing providers.
- Created tracking metrics to evaluate use of educational materials related to return of results.
- Reviewed and updated Biobank website to include additional biobank participant and provider educational resources.
- Very active participation of BIPM primary faculty in the HMGGP PhD program (course co-directorship, teaching, committee membership/chairing, student mentorship).

Plans for the coming year

- Continue marketing and recruitment of students for Personalized Medicine certificate program.
- Provide first offering of online Graduate Certificate Program in Personalized & Genomic Medicine in Spring 2022.
- Disseminate, evaluate, and revise pharmacy educational modules.
- Continue development of educational resources as needed for biobank return of results.
- Obtain Continuing Medical Education (CME) credit for Personalized Medicine educational course and offer course in a variety of online formats for busy clinicians.
- Continue provider engagement through presentations to various divisions and departments, with focus on ambulatory primary care.
- Expand graduate medical trainee educational efforts and offer Personalized Medicine course to all graduate medical trainees affiliated with CU in an online platform.
- Transition website platform to optimize ease of access to educational resources.
- Continue evaluation of educational materials and need for revision or alternate platforms.

Strategy and Innovation

Overview: CCPM is now partnering with CU Innovations to develop and execute on strategic partnerships and collaborations.

Accomplishments over the past year

- Begun to deliver on our \$11.7 million, five-year collaboration with Regeneron Genetics Center with the aim of building Biobank participants to over 450,000.

Goals for the coming year:

- Continue to deliver on our innovation partnerships.
- Lay groundwork to develop and validate novel technologies in the personalized medicine space.

Center Leadership:

Casey Greene, PhD, Interim Director, Colorado Center for Personalized Medicine

David Kao, MD, Medical Director

Ian Brooks, PhD, Director, Compass

Rasika A. Mathias, ScD, Scientific Advisor

Kristy Crooks, PhD, Director, CCPM Biobank

Emily Hearst, MHSA, Program Manager, Clinical Operations

Christine Aquilante, PharmD, Director, PGx-CLIPr

Monica Campbell, MS, Associate Director, CARGO

Chris Gignoux, PhD, Director, PAIR program

Jan Lowery, PhD, Associate Director, Participant Engagement

Sandra Logue, MA, CRA Director, Finance & Administration

Colorado Clinical and Translational Sciences Institute

The Colorado Clinical and Translational Sciences Institute (CCTSI) is a collaboration between the University of Colorado Anschutz Medical Campus, University of Colorado Denver, University of Colorado Boulder, Colorado State University, six affiliated hospitals and health care organizations, as well as multiple community organizations with a goal of accelerating the translation of research discoveries into improved patient care and public health. The CCTSI partner health care institutions include UHealth University of Colorado Hospital, Children's Hospital Colorado, National Jewish Health, Denver Health and Hospitals, Rocky Mountain Regional Veterans Affairs Medical Center, Kaiser Permanente Colorado, and the private sector.

The CCTSI is a National Institutes of Health National Center for Advancing Translational Sciences (NIH/NCATS)-funded research institute at CU Anschutz. It is part of the national consortium of more than 60 Clinical and Translational Science Awards (CTSA) institutional hubs throughout the United States and is funded by one of the largest federal research grants awarded to the state of Colorado. The CCTSI also receives considerable institutional support from CU Anschutz, CU Boulder, CSU, and its affiliated hospitals. The CCTSI has nearly 7,000 individual members who benefit from its services, funding sources, training programs, and other resources. The CCTSI functions through 15 major programs, each with multiple cores, including: 1) Informatics, 2) Community Engagement and Research, 3) Collaboration and Team Science, 4) Workforce Development, 5) TL1 Training Core, 6) KL2 Institutional Career Development program, 7) Pilot Translational Studies, 8) Regulatory Knowledge and Support, 9) Biostatistics, Epidemiology and Research Design, 10) Participant and Clinical Interactions, 11) Integrating Special Populations, 12) Trial Innovation Network Hub Liaison Team, 13) Innovation Ecosystem, 14) Early Life Exposures Program and 15) Dissemination and Implementation Science. The vision of the CCTSI is to accelerate and catalyze the translation of innovative science into improved health and patient care. To reach this vision, the mission of the CCTSI is to:

- Catalyze and enhance scientific discovery, innovation, dissemination, and translation across the lifespan;
- Educate and sustain a resilient, innovative, and diverse translational science workforce;
- Promote and ensure an efficient, safe, collaborative, and integrated research environment; and
- Engage stakeholders and communities across the entire translational spectrum.

Some of the goals of the CCTSI are to

- Develop, educate, and sustain a diverse translational science workforce to ensure the highest research innovation, quality and safety.
- Create a translational research environment where team science and collaboration are facilitated, supported and valued both locally and nationally.
- Engage local and national communities and stakeholders in all phases of the translational research process.
- Create novel methodologies and resources to support and integrate research in special populations, including children, the elderly, the underserved, and those with rare diseases.

A rigorous tracking, assessment, and evaluation program with a formal quality and process improvement component ensures the best use of resources while protecting the safety of research study participants. These programs are centralized at the CU Anschutz Medical Campus.

The CCTSI was originally funded in 2008 and has been refunded by the NIH several times, most recently for the period 2018-2023 to support the full range of T0.5 through T4 translational research in a disease-agnostic manner across the breadth of the life cycle. Through the partnership with CSU, which is recognized for its world-class school of veterinary medicine and other programs, the CCTSI has expanded the spectrum of translational research to include T0.5 research, translating promising pre-clinical discoveries into naturally occurring animal models (companion to domestic animals) of human disease.

The CCTSI has implemented two information systems for the institution's research community: 1) "Colorado Profiles," a search engine and networking tool for biomedical researchers at CU and affiliates, which receives over 25,000 monthly page views; and 2) REDCap (Research Electronic Data Capture) which is a secure, HIPAA-compliant web-based application designed for research data collection, storage and transfer. Over the past year, REDCap has supported more than 5,705 active users with more than 15,000 projects.



The CCTSI provides resources and services, including five Clinical and Translational Research Centers (CTRCs). Before the COVID-19 pandemic, CTRCs facilitated and supported more than 400 clinical research projects led by over 200 principal investigators. All non-essential research was ceased during Colorado's initial stay-at-home order in March 2020. The CTRC started to allow investigators to engage in a phased reintroduction to research from summer through fall 2020. In summary, during 2020, 261 studies were led by 139 PIs at the University of Colorado Hospital CTRC; 47 PIs led 73 clinical projects at the Children's Hospital Colorado CTRC.

The CCTSI supports additional resources for clinical research, including two Clinical Trials Offices; Biostatistics, Epidemiology and Research Design (BERD); Research Bioethics Consultation services and assistance; Research Studios; informatics and database support; pilot grant funding opportunities; and an array of educational and career development programs for clinical and translational investigators and their staff at all affiliated institutions.

CTRCs (at University of Colorado Hospital, Children's Hospital Colorado, National Jewish Health, and CU Boulder) offer incomparable clinical research facilities, research nursing support, specimen and biopsy processing, bio nutrition expertise, specialized laboratory assays, vascular ultrasound testing, exercise testing facilities, and other services to facilitate the conduct of patient-oriented research.

Education programs include the Clinical Sciences PhD and master's graduate programs, KL2 research scholar program and TL1 pre-doctoral and post-doctoral training program, Clinical Faculty Scholars Program, CO-Mentor training program, K-to-R transition program (mock study section), Pre-K assistance program, the Leadership for Innovative Team Science (LITeS) program, Research Studios and the Innovation-Corps (I-Corps) training program. In 2020, we launched a new workshop series called Communicating Your Science to the Public. The series seeks to build trust in science while empowering researchers with the skills to tell a compelling story about their science and why it is important.

A robust pilot grants program and new methods development funding program are some of the most popular CCTSI programs that have assisted numerous investigators in obtaining follow-on funding.

The CCTSI created the Partnership for Academicians and Communities in Translation (PACT) to transform the way communities and researchers work together to design and conduct research by building bridges and trust between health research, clinical practice and community health initiatives to improve the health of the people of Colorado and the Rocky Mountain region. The PACT encompasses more than 20 Colorado communities, 940 physician practices, and 28 hospitals throughout the region. The Early Life Exposures Research Program (ELEP) facilitates research during pregnancy, infancy and childhood and emphasizes life-cycle research involving fetal and childhood precursors of adult disease.

The Innovation Ecosystem program provides early training in market evaluation (I-Corps@CCTSI) and support for commercialization for promising ideas and products. In 2020, our Innovation Ecosystem started offering a monthly lunchtime forum called Ask the Expert in collaboration with Venture Partners at CU Boulder, CSU Ventures, and the NIH Research Evaluation and Commercialization Hubs (REACH) grant at CU Anschutz. The ongoing series is for researchers and academics who are interested in entrepreneurship, device and technology development, and innovation. Every month, academics and innovators engage in a lively and provocative interview with an expert, followed by a Q&A session.

Our Research Studio Program organizes a customized team of experts to provide feedback and new ideas in a 90-minute focused session to investigators on a variety of topics chosen by the investigator.

Responding to the ongoing pandemic

Once the COVID-19 pandemic hit, the CCTSI adjusted its activities to respond to the greatest needs of researchers and our community. In 2020 we launched a new pilot grant program focused on urgent actionable research needs addressing COVID-19. In the summer of 2021, [we reported on their activity](#). For two years running, our annual academic conference, the CU-CSU Summit, [focused on COVID-19 research](#), attracting expert speakers from the NIH/NIAID, CU Boulder, CU Anschutz, and Colorado State University.

Our pediatric and adult CTRCs and CCTSI researchers have been instrumental in testing treatments for COVID-19 as well as testing multiple vaccines in the adult and child populations.

Examples of innovative projects we are helping to lead include [mAb Colorado](#) and the [NIH CO-CEAL](#). The aims of mAb Colorado are to reach the COVID-positive Coloradans with monoclonal antibody treatments early on to prevent hospitalization and to study how to best disseminate information and reach underserved populations in our state. The Colorado CEAL Team (CO-CEAL) is a partnership between the CCTSI, CU Anschutz, and multiple community-based organizations and individuals. The goal is to provide trustworthy information through active community engagement and outreach to the people hardest hit by the pandemic while building long-lasting community partnerships to improve diversity and inclusion in COVID-19 research for new treatments, vaccines, and other virus prevention practices.

The CCTSI is led by **Ronald J. Sokol, MD**, principal investigator and director of the CCTSI, and a team of dedicated associate directors and administrative staff: Wendy Kohrt, PhD, Janine Higgins, PhD, Tim Lockie, MS, MBA, Chris Baker, MD, Tell Bennett, MD, Cathy Bodine, PhD, Ellen Burnham, MD, Thomas Campbell, MD, Nichole Carlson, PhD, Lisa Cicutto, PhD, Marilyn Coors, PhD, Thomas Flaig, MD, Adit Ginde, MD, Melissa Haendel, PhD, Teri Hernandez, PhD, Goldie Komaie, PhD, Bethany Kwan, PhD, Alison Lakin, RN, LLB, LLM, PhD, Wendy Meyer, MA, Donald Nease, MD, MPH, Jane Reusch, MD, Natalie Serkova, PhD, Debra Szuster, MS, Montelle Tamez. Researchers from CU Boulder, Colorado State University, and National Jewish Health also play leadership roles: Chris DeSouza, PhD, Sue VandeWoude, DVM, Matt Hickey, PhD, and Donald Leung, MD, PhD. Check out the [CCTSI website](#) for further information and opportunities.

Center for Interprofessional Practice and Education

As the complexity of health care has grown, the demand for new, crosscutting interprofessional competencies from health care professionals has become increasingly recognized. The University of Colorado Anschutz Medical Campus is distinguished nationally for its investment, commitment, and innovation in Interprofessional Education (IPE).

Vision: Transform health professionals and health care through nationally and internationally recognized interprofessional education and practice.

Mission: Prepare health professionals for interprofessional, collaborative practice through innovative education and scholarship.

Overview: The CU Center for Interprofessional Practice and Education (CU CIPE) develops, administers, and evaluates the longitudinal interprofessional education curriculum for all health professions students on the Anschutz Medical Campus. The program brings students from health professions programs on our campus together to learn and practice skills during their preclinical and clinical training. Our curriculum consists of several components: early exploratory opportunities, classroom team-based learning, simulation experiences, and advanced practicum experiences at clinical sites. After participating in our program as part of their health professions training, our graduates will be competent to participate as members of a collaborative interprofessional workforce

Background: From 1995 to 2013, the Anschutz Medical Campus ran an interprofessional ethics course, bringing together students from all the health professions. This effort was expanded to include competencies in teamwork and collaboration from 2010-2013 through Josiah Macy Jr. Foundation and Colorado Health Foundation funding. At the termination of the grant, the program was reorganized and led by founding IPE Director, Mark Earnest, MD, PhD, and an IPE Council with designees from each degree-granting school or program on campus. Members of the inaugural council in 2014 included: Wendy Madigosky MD, MSPH (School of Medicine), Kari Franson PharmD, PhD (Skaggs School of Pharmacy and Pharmaceutical Sciences), Diane Brunson RDH, MPH (School of Dental Medicine), Amy Nordon-Craft PT, DSc (Physical Therapy Program), Amy Barton PhD, RN, FAAN (College of Nursing), Darcy Solanyk MS, PA-C (Physician Assistant Program), and Jackie Glover PhD (Center for Bioethics and Humanities).

Leadership:

Director **Suzanne Brandenburg, MD**, School of Medicine

IPE Assistant Directors

Amy Akerman, MS, PA-C, Physician Assistant Program

Doug Fish, PharmD, FCCP, Skaggs School of Pharmacy and Pharmaceutical Sciences

Scott Harpin, PhD, MPH, RN, College of Nursing

Wendy Madigosky, MD, MSPH, School of Medicine

Amy Nordon-Craft, PT, DSc, Physical Therapy Program

Lindsey Yates, DDS, MPH, School of Dental Medicine

IPE Program Representatives from Bioethics and Humanities

Cate Campisi, MSN, RN, PMHNP-BC

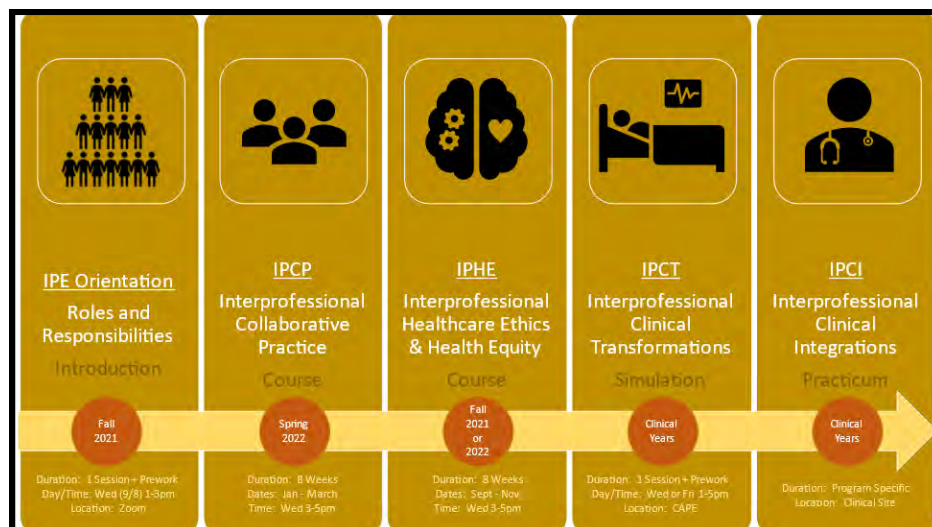
Interprofessional Education & Development (IPED) Course Director Wendy Madigosky, MD, MSPH, School of Medicine

Interprofessional Collaborative Practice (IPCP) Course Director Amy Nordon-Craft, PT, DSc, Physical Therapy Program

Interprofessional Healthcare Ethics and Health Equity (IPHE) Course Director Cate Campisi, MSN, RN, PMHNP-BC, College of Nursing

Interprofessional Clinical Transformations (IPCT) – IPE Simulation Director Elshimaa Basha, MPH, CHSE, Center for Advancing Professional Excellence
Interprofessional Clinical Integrations (IPCI) – Interprofessional Practice Director Eric Gilliam, PharmD, BCPS, Skaggs School of Pharmacy
Interprofessional Instructional Designer Michelle Colarelli, MA, School of Medicine
Program Administration Reesie Roland and Allie Logue

Interprofessional Education Program Components



The CU CIPE Education Program consists of four curricular components:

- In the past, Interprofessional Education Orientation included the Interprofessional Open Campus Program was suspended due to the COVID-19 pandemic. Despite this, students based on their interests and in keeping with their individual health professions program rules, volunteered in several interprofessional endeavors to make a difference in our health care settings and our local communities. Students also participated on a voluntary basis in the One Book One Campus Program and the related lecture series. The IPE orientation focused on the role of interprofessional collaboration in addressing health disparities. Moving forward there will be a greater emphasis on roles and responsibilities during orientation and issues related to health equity will be addressed in the ethics (IPHE) course.
- Interprofessional Collaborative Practice and Interprofessional Healthcare Ethics & Health Equity are two introductory courses that were created in 2020-21 to replace Interprofessional Education and Development (IPED). IPED was developed by the IPE Council and involved first- and second-year students (over 1500 students) from six health professions in a 16-week, team-based learning experience. Students worked together in a classroom setting or via on-line teams using Team Based Learning (TBL) over two semesters (eight sessions in the Spring of Year 1 and eight sessions in the Fall of Year 2). Three competency domains were addressed meeting national accreditation standards and participating school requirements: Teamwork & Collaboration, Ethics & Values, and Quality & Safety. IPED was successfully delivered in a virtual format during the 2020-21 academic year to the credit of our adaptable faculty, facilitators, and students. We look forward to launching the new introductory courses during the 2021-22 academic year.
- As part of their Interprofessional Clinical Transformations (CT) experience, students spend a half day in the Center for Advancing Professional Excellence (CAPE) simulation center. Students practice teamwork and collaboration skills, identify, and discuss ethical and patient safety issues, and engage patients and family members to deliver patient-centered care during 4 hours of video-monitored interprofessional team simulations. Scenarios include acute care, outpatient, and home visit settings. Due to the COVID-19 pandemic, an online option was developed and successfully implemented.

- The overall goal of Interprofessional Clinical Integrations (IPCI) is to provide relevant immersion experiences focused on learning and caring for patients in interprofessional teams. These experiences occur in multiple settings including community-based organizations, hospitals, medical clinics, dental clinics, home visits, transitions in care, palliative care, and others. CU CIPE supports learner assessment, faculty development, and site enhancement during Advanced Clinical Practicums where students interact with patients and interprofessional colleagues in authentic health care settings later in their training. The aim for this portion of the curriculum is to provide a mechanism by which health profession students may demonstrate their collaborative interprofessional team skills in a clinical environment. CU CIPE is working to achieve campus-wide engagement through a standardized student assessment tool aligned with the Interprofessional Education Collaborate (IPEC) 2016 competencies which are endorsed by the Liaison Committee for Medical Education (LCME) Commission on Osteopathic College Accreditation (COCA), and more than 60 other health professional organizations. In 2020-21, students from several programs piloted the assessment tool in the clinical learning environment pandemic restrictions permitting.

Faculty Involvement

Dozens of full-time and many volunteer faculty members contribute to building and implementing these innovative programs, demonstrating the deep commitment of Anschutz Medical Campus to prepare a health care workforce ready to collaborate, practice, and lead in an increasingly complex health care environment.

Key Program Accomplishments 2020-2021

The CU Center for Interprofessional Practice and Education reached over 2,000 students in 2020-21 and focused on sustaining engagement during the pandemic. Initiatives in support of these efforts included:

One Book One Campus: the 2020 selection was *Black Man in a White Coat* by Damon Tweedy, MD, describing his experience grappling with race, bias, and the unique health problems of black Americans. Tweedy participated in a lecture series on the Intersections of Race, Class and Health. His virtual presentation and informative Q&A session were co-sponsored by CU CIPE and the Center for Bioethics and Humanities. CU CIPE also hosted virtual book clubs.

Interprofessional Education focused Federally Qualified Health Center in Aurora, Colorado: CU CIPE is a key stakeholder and participant in the development of the Aurora Community Health Commons with an eye toward implementing learner focused new models of collaborative practice. The anchor of the project is an Interprofessional Education focused Federally Qualified Health Center via a partnership between the University of Colorado Anschutz Medical Campus and Salud Family Health Centers.

Partnership in Education, Training, and Research Advancement (PETRA) is an NIH-funded grant awarded to the University of Zimbabwe College of Health Sciences. The CU CIPE director is participating in grant activities focusing on two of the project aims. These pertain to the development new interprofessional education and collaborative practice curricula, and to advances in the quality and numbers of health professionals retained in areas where they are most needed in Zimbabwe by developing, implementing, evaluating, and disseminating innovative interprofessional health education initiatives. Due to pandemic related travel restrictions, grant activities shifted to virtual workshops during the 2020-21 year.

CU CIPE Curricular Redesign is progressing, and the two new introductory courses - IPCP and IPHE will launch during the 2021-22 academic year. Curricular efforts reinforce the shared responsibility of all health professions to address the complex health care problems of society as they strive to improve the health of patients and populations.

Adaptation to the COVID-19 Pandemic with new and modified curricular elements for both current students and for incoming students. Beginning in the fall 2021 our introductory courses will move toward a HyFlex model. This is a student-centered model of class delivery that integrates in-class instruction, online synchronous sessions, or asynchronous content delivery. This approach will provide more flexibility for students and instructors in the current unsettled and ever-changing environment.

For additional information on the CU Center for Interprofessional Practice and Education (CU CIPE), please see our website: <https://www.cuanschutz.edu/centers/IPE>

CU Multidisciplinary Center on Aging

The CU Anschutz Multidisciplinary Center on Aging (MCoA) includes the following focus areas: **Research, Clinical, Education, Outreach/Engagement**

MCoA is guided by a Multidisciplinary CU Anschutz Medical Campus Executive Committee representing clinicians, researchers, and faculty representatives from each CU Anschutz Medical Campus schools. In 2020, CU MCoA added two faculty to their Executive Committee: Cari Levy, MD, Rocky Mountain Regional VA Medical Center and Ethan Cumbler, MD, FACP, FHM, Professor Departments of Medicine and Surgery, CU Anschutz Medical Campus

Research: Research includes over \$7.4 million annually in funded grant projects

- ***MoTrPAC (Molecular Transducers of Physical Activity in Humans):*** Wendy Kohrt, PhD, director of research, directs one of the six clinical centers for this \$180 million national initiative sponsored by the NIH Common Fund, and she is chair the executive committee.
- ***SCORE (Specialized Center of Research on Sex Differences):*** This innovative interdisciplinary NIH research program focuses on sex differences and major medical conditions affecting women.
- ***T32 Integrative Physiology of Aging Training Grant:*** Since 2001, this NIH grant has supported five pre-doctoral and five postdoctoral trainees conducting aging research with university faculty mentors.
- ***Eastern Colorado GRECC (Geriatric Research, Education, and Clinical Center):*** The most recent of the 20 national GRECCs, the program supports research, education, and clinical demonstration projects. It also supports four Advanced Geriatric Fellows (MD and PhD).
- ***CU Anschutz Advance Practice Provider (APP) Geriatric Training Program:*** The first of its kind, our APP Geriatric Training Program attracts, and trains APP interested in providing geriatric care in Colorado. A companion Senate Bill (SB158), passed during the 2021 Colorado Legislative Session, will provide significant loan repayment for APPs who provide geriatric care in underserved rural or urban setting.
- ***Multidisciplinary Elder Protection Clinical Team:*** This is a two-year award from Colorado Department of Criminal Justice (\$831,972) to build the first statewide Vulnerable Elder Protection Services and Advocacy Team serving patients at UHealth University of Colorado Hospital and Denver Health.

Clinical/Engagement

- In response to COVID-19, a ***CU Anschutz Multidisciplinary Student Outreach Team*** (Schools of Medicine and Pharmacy, and College of Nursing) was formed to make calls to check up on the health of isolated older adults' patients. The program, COAST-IT (Connecting Older Adults and Students Through Interprofessional Telecare) expanded in 2021 to include the School of Dental Medicine students. Over 150 older adults and students have been paired as phone partners to help reduce social isolation in the elderly population. COAST-IT was awarded the 2021 Social Innovation Award from the National Association of Area Agencies in Washington D.C.

Education

Geriatric Fellowships Training

- Geriatric Medicine filled fellowship positions, receiving over 20 applications for two clinical spots for FY21-22. We also have 10 T32 training slots (pre/post-doc), four GRECC Advanced Geriatrics slots (MD/PhD) and two Geriatric APP positions to include a nurse practitioner and a physician assistant trainee.

Other Trainings

- Over 50 Internal Medicine Residents receive outpatient and subacute care training each year; Geriatrics faculty attend on the Acute Care of the Elderly Inpatient Service at UCH. 200+ medical students annually are taught principles of geriatric care in classrooms/clinics.

Research Team Training

- The MCoA created programming during 2020-21 for the T32 Team Science Training program. Developed as part of the Applied Physiology of Aging T32, it has expanded to all T32 trainees in the Department of Medicine. The program assists junior researchers to build and maintain in research teams and to enhance their leadership skills.

Outreach/Engagement

Colorado State Government

- **SB158: Loan Forgiveness for Geriatric Trained Advance Practice Providers in Rural and Underserved Colorado** initiated by CU MCoA and sponsored by Sen. Jessie Danielson, was signed into law by Gov. Jared Polis on July 5, 2021. CU MCoA is working closely with the state to implement the loan forgiveness program for geriatric-trained NPs and PAs.
- **Colorado Center for Aging (CCA)** –Jodi Waterhouse, MHA, director, outreach programs, was elected to a three-year term on the Colorado Center for Aging Board of Directors (2020-2023) and holds position of Secretary of the Board.
- MCOA actively participates in 1) Colorado Strategic Action Planning Group on Aging (SAPGA); 2) Bell Policy Institute; 3) Colorado Financial Security Coalition
- MCoA is a founding member of the Colorado Consortium on Aging Research and Education (**CoCare**) and continues to participate.
- MCoA created the **Movers & Shakers in Aging Group** in 2019 to bring together leaders in government, industry, nonprofits, and community to address complex aging issues for Colorado. Robert Schwartz, MD, Sarah Tietz, MD, and Jodi Waterhouse, MHA, are representatives to this group.
- In collaboration with AARP, MCoA has created the following Town Hall educational opportunities
 - **AARP Colorado Health & Wellness Series – Spring 2021** (four-week series featuring CU Division of Geriatric Medicine Clinician).
 - **AARP National Town Halls Navigating the Global Coronavirus Pandemic** (Six national appearances, Steve Johnson, MD).
- MCoA and the AMC Center for Bioethics created and co-hosted a Webinar Town Hall
 - **Crisis Standards of Care – Does Age Matter?** Dan Matlock, MD, and others.
- MCoA Community Education Offerings (2021)
 - **Emotional & Mental Health in Older Adults Webinar Series**, Launched Summer 2020 in partnership with University of Colorado Colorado Springs Aging Center.
 - **A Practical Approach to Race-Based Stress & Trauma in Older Adults**, Hillary Lum, MD, and Samantha Farro, PhD, in partnership with the Veteran Community Partnership at the Rocky Mountain Regional VA
 - **Working with Older Adults** Sarah Tietz, MD, Trikshaw of Colorado
 - **Introduction to Advocacy** at Bell Policy Workforce Development Summit, Jodi Waterhouse, MHA
 - **A Look at the CU MCoA** at Aurora Commission on Aging, Jodi Waterhouse, MHA
 - **Moderate Panel– Ageism and Workforce Development** at CCA, Jodi Waterhouse, MHA

CU MCoA hosted over 25 Community presentations and reached an audience over 10,000 attendees during 2020-21.

Student and Resident Mental Health

Student and Resident Mental Health

Rachel Davis, MD, medical director

Juan DeJesus, MD, associate medical director

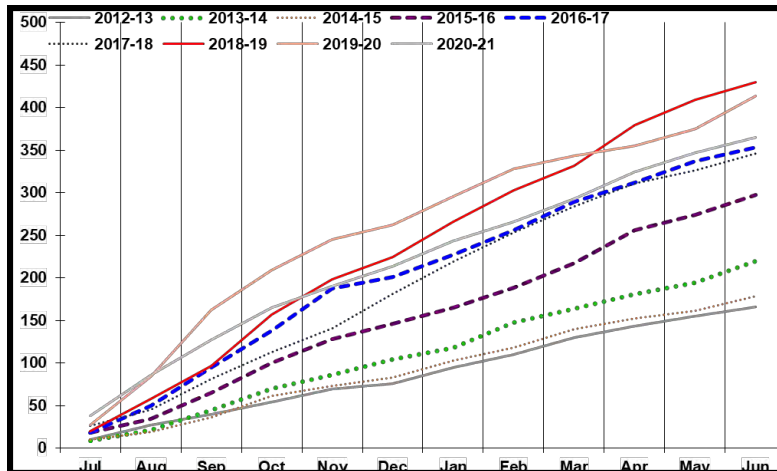
Julie Wolfe, MD, associate medical director

Mission

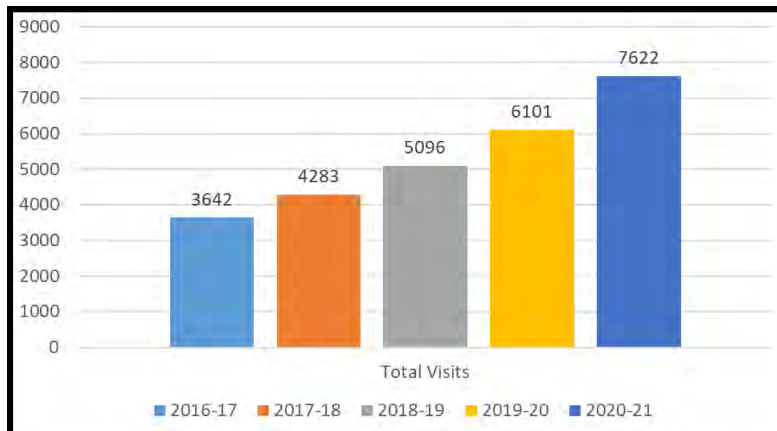
Student and Resident Mental Health (SRMH) on the Anschutz Medical Campus exists to facilitate evaluation and treatment of mental health issues in students and residents/fellows of the Anschutz Medical Campus. By minimizing barriers to care, the center aims to reach as many students and residents as possible. The faculty at SRMH specialize in treating the issues students encounter and strive to provide them with optimal mental health treatment.

SMH was established in 2009 in the Department of Psychiatry and has expanded over the past 12 years to meet the needs of the students on campus. In 2015, a second SMH clinic site was opened. In 2019, SMH started offering services to residents and fellows at both CU GME and Denver Health and Hospital Authority, thereby becoming Student and Resident Mental Health (SRMH). These expansions have allowed Student and Resident Mental Health to increase provider availability and ease of access by offering walk-in appointments, after-hours appointments, and same-day appointments as well as 24/7 on-call coverage by Psychiatry faculty.

AMC Student and Resident Mental Health New Evaluations



AMC Student and Resident Mental Health – Total Visits



SRMH accepts many insurance plans through CU Medicine. When utilizing on-campus care, students with the student-sponsored insurance have access to an unlimited number of visits with zero copay for covered diagnoses. Services offered at SRMH include:

- Diagnostic evaluation
- Medication management
- Psychotherapy
- Psychoeducational testing
- Group therapy

SRMH collaborates with a network of community providers and refers to this network if preferred by the student, if covered by certain insurance plans, and as needed due to provider expertise.

Students and residents/fellows present with various concerns including but not limited to:

- acute stress management, test and performance anxiety, LGBTQIA issues, relationship difficulties, time management, ADHD, anxiety, depression, bipolar disorder, psychotic illnesses, substance use disorders, eating disorders, obsessive-compulsive disorder (OCD), post-traumatic stress disorder, personality disorders, grief, and domestic violence.

SRMH offers several ongoing and brief groups including a cognitive behavioral therapy group for students with OCD and anxiety, a skills-based ADHD group, a dialectical behavior therapy group and an “anxious together” support group. Future groups will include a therapy waitlist group, ADHD medication management group, trauma informed yoga group, psychodynamic psychotherapy group, and a mindfulness meditation group.

SRMH faculty collaborate with other faculty and departments on campus to provide education, outreach, and other events aimed at reducing stigma and providing education about mental health issues.

Since March 2020, SRMH has been providing telehealth visits to patient as a result of COVID-19.

Student and Resident Mental Health Fitzsimons Building

Services: Behavioral/mental health care, on-site phlebotomy

Hours: Mental health providers are available Monday - Wednesday 8 a.m. – 8 p.m. and Thursday through Friday 8 a.m.-5 p.m.

Walk-in appointments available Monday – Friday 8 a.m. – 4 p.m.

Appts.: Schedule appointments at 303-724-4716 or smhservice@ucdenver.edu

Location: Fitzsimons Building, 17th Avenue and Aurora Court, 2nd floor, #E2343

Website: www.medschool.ucdenver.edu/amcstudentmentalhealth

Current Providers

Rachel Davis, MD, Medical Director

Juan DeJesus, MD, Associate Medical Director

Julie Wolfe, MD, Associate Medical Director

Matthew Pesko, MD

David Brown, MD

Debbie Carter, MD

Christian Hopfer, MD (Addictions)

Mallory Crouch, LCSW (Addictions)

Elizabeth Erikson, MD (Eating Disorders)

Rachel Zavala, RD (dietitian)

Noa Heiman, PhD

Laura Hockman, PsyD

Robert Rosenthal, PsyD

Stephanie Lehto, PsyD

Amanda Doria, LPC, Mental Health Triage Counselor, Wellness and Outreach Coordinator

Daniel Sukenik, LMFT

Rachel Winkler, LPC

Brian Wang, PA

Wanda Jackson, Medical Assistant, Health Care Tech III

*24/7 crisis coverage is provided by the Department of Psychiatry faculty, fellows, and resident call system. If emergent treatment is needed, students can be seen in the UCHHealth Emergency Department via the Student and Resident Mental Health track.

Recent Projects and Accomplishments:

- Offered students free 20-minute consultations related to COVID anxiety leading to referrals to care and acute support.
- Led campus-wide support group for students affected by the COVID-19 pandemic.
- Continued outreach project with the medical school which has resulted in increased utilization of SRMH services by 11% year over year.
- Medical Student Mental Health Research: measuring mental health rating scales at matriculation and at the end of each academic year.
- Provided mentorship and collaborated with Advocates for Mental Health to develop programming, outreach and events related to mental health advocacy on campus including an anti-stigma panel, educational session around helping with navigating the mental health system and finding a therapist as well as a biweekly program providing support around coping in the time of COVID-19.
- Collaborated with the Denver Health Longitudinal Integrated Curriculum to offer prescheduled (optional) appointments for each student who will be granted a “required” mental health day.
- Continued to serve as a rotation site for the University of Colorado general psychiatry residency program.
- Offered Monday-Friday walk-in availability to all students and residents.
- Provided specialty services in addictions and eating disorders.
- Supported several residency programs on the Anschutz Campus by providing “opt-out” appointments for incoming interns to establish mental health care, monthly support groups, and leading resident retreat activities.
- Added a care coordinator/case manager to help ensure smooth referral processes and support students in accessing resources related to mental health care.

Upcoming Change

In fall 2021, the SRMH Fitzsimons location and SRMH Camus Health Center location will be moving the new Anschutz Health Sciences Building, sharing space with the Campus Health Center to offer an integrated care model for students, residents, and fellows.



Graduate Programs



The photo above is courtesy of @cumedschool Instagram, May 26, 2021.

Biomedical Sciences Umbrella (BMSC)

The Biomedical Sciences Program (BSP) was formed at the University of Colorado Anschutz Medical Campus in 1997. The BSP serves as an umbrella program, providing incoming students with the ability to rotate with faculty across numerous disciplines and graduate programs. This provides significant flexibility for students to choose from different research areas to pursue their graduate degrees. Kristin Artinger, PhD, and Aaron Johnson, PhD, co-direct BSP, and have an established executive committee of faculty members representing multiple programs, to help advise the directors on faculty membership, student mentorship, and admissions. Students who matriculate in the BSP will perform coursework and laboratory rotations in their first year. For rotations, students can choose to rotate in the labs of any of the over 214+ faculty in the program. Upon successful completion of the first year of graduate school, the students will join their laboratory of choice, as well as one of the 11 different graduate programs housed at the University of Colorado Anschutz Medical Campus. It is our goal in the BSP to expose incoming graduate students to a variety of biomedical science disciplines, train students to evaluate scientific literature, think critically, develop testable hypotheses and guide them in their search for a biomedical discipline in which to perform thesis research.

<https://www.cuanschutz.edu/graduate-programs/biomedical-sciences-program/home>

Cancer Biology (CANB)

The Cancer Biology Graduate Program is an interdepartmental program that was created in 2006. The program is directed by Rebecca Scheweppe, PhD, and combines training in the basic biomedical sciences with opportunities to apply clinical and translational research to studies on human cancer. The Cancer Biology Program is committed to educating PhD students in the fundamentals of modern biomedical research, but differs from more traditional programs in that we also provide opportunities for students to learn about clinical and translational aspects of cancer biology. We believe that understanding cancer from multiple perspectives will better prepare students to compete in a biomedical research environment increasingly focused on translational applications of basic research. The goal of the Cancer Biology Program is to attract outstanding students with the highest potential and to stimulate in them the independent and creative scientific thinking necessary to develop future leaders in the multifaceted field of cancer research. The program's highly accomplished training faculty includes over 40 basic and clinical scientists drawn from various fields of biomedical and clinical sciences. Areas of emphasis include lung, breast, head and neck, thyroid, prostate, bladder, and blood cancer. Our curriculum is rigorous, yet flexible, and provides opportunities for advanced study in cellular and molecular oncology, as well as the translational medical sciences. The University of Colorado Anschutz Medical Campus is home to an NIH-designated Comprehensive Cancer Center, an acknowledgment of its role as a leader in both clinical cancer treatment and basic cancer research. Our research community brings together scientists with diverse research approaches to focus on the problem of cancer. Graduate students are a vital part of this community and as a program we strive to build a vibrant and supportive learning environment. The program facilitates multiple events to build this community including journal clubs, a seminar series, poster sessions, and an annual retreat in the Rocky Mountains.

<https://www.cuanschutz.edu/graduate-programs/cancer-biology>

Cell Biology, Stem Cells and Development (CSDV)

The Graduate Program in Cell Biology, Stem Cells and Development (CSD) was created in 2007 as an interdepartmental and interdisciplinary training program, engaging students and faculty from more than 10 basic science and clinical departments and numerous members of the Gates Center for Regenerative Medicine. The CSD program provides graduate training for doctoral students in hypothesis-driven experimental approaches and cutting-edge technology to allow students to pursue important questions at the juncture between the fields of cell, developmental, and stem cell biology. CSD students and faculty have common interests in understanding how cells function and signal in development, and how cellular-level functions contribute to human disease and regenerative therapies. This common curiosity promotes extensive collaboration and interaction among labs. Our students consistently say that the prime reason for selecting the CSD program is the collaborative and open nature of interactions among members of the program. In addition, CSD provides structured training in mentoring, teaching, and science communication to equip students for leadership positions in academia, industry, and other careers. The program currently comprises an interactive group of 36 students and 59 training faculty, which is sufficiently small to provide a close-knit, supportive yet rigorous, training environment, while large enough to provide a scientifically varied set of labs and mentors with which to interact.

In the past year, CSD students published 22 scientific publications, were awarded two new NIH F31 fellowships, received two Honorable Mentions on NSF GRFP proposals, created a new Advanced Writing Workshop course to serve all CU AMC PhD students, and launched a new research training pipeline program for undergraduate students. In July 2021, CSD was awarded a new T32 training grant from NIGMS to strengthen training opportunities in the Genetics of Development, Disease and Regeneration.

<https://www.cuanschutz.edu/graduate-programs/cell-biology-stem-cells-and-development>

Computational Bioscience (CPBS)

The Computational Bioscience Program trains students to develop novel computational methods for advancing biology and medicine. We seek students who aspire to achieve excellence in research, education, and service, and who will apply the skills they learn toward improving human health and deepening our understanding of the living world. The Computational Bioscience program provides graduates with the foundation for a lifetime of continual learning. CPBS creates professionals prepared to conduct interdisciplinary research in the fields of translational bioinformatics, clinical research informatics, and computational molecular biology. Graduates have the expertise to join faculty programs in bioinformatics, medicine, or computer science, or to assume high-level research positions in government or industry. Our curriculum integrates training with computation and biomedical sciences with student research and teaching activities that grow increasingly independent through the course of the program. Our students begin supervised research immediately, collaborating with top scientists, working with the latest high-throughput instruments on critical biomedical problems. Research training spans computational aspects of basic translational and clinical sciences in a wide variety of disciplines and disease areas.

<https://www.cuanschutz.edu/graduate-programs/computational-bioscience/home>

Human Medical Genetics and Genomics (HMGG)

The Human Medical Genetics and Genomics Graduate Program at the University of Colorado School of Medicine provides training to graduate students interested in a field of research that has seen an unprecedented explosion of data, knowledge, and innovative technologies. DNA sequencing of genomes of humans and other species, discovery of genes and variations that underlie development and disease, and rapid application of these discoveries to medical practice is revolutionizing medicine by precise diagnostic tests, targeted treatments, and even disease prevention. It is anticipated that “personalized” or “precision” medicine will thereby dramatically improve human health, longevity, and quality of life. Founded in 1997, the Human Medical Genetics and Genomics PhD program teaches our students modern genetics and genomics theory and methodology, critical reading and assessment of the literature, formulation and testing of research hypotheses, advanced experimental techniques, bioinformatic and statistical analysis of genomic and other “omics” data, and interpretation of results to answer key scientific questions. Our faculty includes over 50 laboratory scientists and clinicians, providing an exceptionally interactive and collaborative environment that enables quick translation of the latest genetic and genomic discoveries from the bench to the bedside. Our goal is to provide a nurturing yet rigorous training environment in which our students can thrive intellectually and be scientifically productive under the guidance of a supportive and highly collaborative faculty. As a result, our students have presented their research at national and international scientific conferences, published their research in highly respected scientific journals, and have received awards and grants from both institutional and external funding agencies. Our PhD students have also been highly successful in their subsequent careers, including in academia, industry, teaching as well as non-traditional settings like forensics and regulatory affairs.

<http://medschool.ucdenver.edu/genetics>

Immunology (IMMU)

Immunological research in Colorado has a rich history punctuated by numerous seminal discoveries related to allergy, immune recognition, immune signaling, immune tolerance, and inflammation. A primary mission of internationally recognized Graduate Program in Immunology is to educate and train the next generation of immunologists for careers heading competitive and productive research programs. Numerous graduates from the program hold leadership roles in academic or industry research settings. The immunological expertise we provide to our graduates has also fostered success of our graduates in areas of public health, science policy, and education. We offer rigorous didactic courses in immunology, inflammation biology, and related fields.

Our faculty evaluate, instruct, and mentor students in the program through these courses and through experiential studies that foster experimental competence, intellectual development, inquisitiveness, and communication skills. Further, a collaborative and supportive educational and research environment supports the ability of our students to achieve scientific excellence and demonstrate their productivity through authorships and speakerships. The immune system plays a central role in many current national and global health issues. By exposing our graduate students to both basic and translational science approaches, our graduate training program enriches the student experience in a practical and meaningful manner. Our graduates are prepared to make seminal advances in basic understanding of the immune system and its functions and to manipulate the immune system for improving human health in clinical contexts. The Graduate Program in Immunology is supported by NIH T32 training grants and includes faculty mentors from more than a dozen departments and divisions at the University of Colorado Anschutz Medical Campus, National Jewish Health, or the Barbara Davis Center for Childhood Diabetes. Laurel L. Lenz, PhD, is the program director, with R. Lee Reinhardt, PhD, serving as associate director.

<https://www.cuanschutz.edu/graduate-programs/immunology>

Integrated Physiology (IPHY)

The Integrated Physiology (IPHY) Program is a diverse graduate program on the Anschutz Medical Campus that consists of exceptional basic and clinician scientist training faculty from 19 basic and clinical departments/divisions, including departments/divisions from the School of Medicine, the Skaggs School of Pharmacy and Pharmaceutical Sciences, and the School of Dental Medicine. The program is structured to leverage the rich research expertise on the campus in areas such as reproductive sciences, obesity and nutrition, cardiovascular and pulmonary diseases, metabolism and endocrinology, and perinatal biology. Many of these disciplines are supported by successful centers on campus that are directed by IPHY training faculty. IPHY offers training opportunities for students who have an interest in all aspects of physiology, from system/organ physiology to cell/molecular physiology, and provides opportunities for students to interact with NIH R01-funded basic science and clinician faculty. The study of physiology is at the core of modern biomedical research, which relies on integrating fundamental concepts of whole animal and organ physiology with sophisticated molecular and cellular approaches to investigate questions related to human health and disease. Our overall program objective is to train graduate students to understand mechanisms underlying the function of various systems in the body that contribute to both normal and pathological physiology. With this knowledge, they become proficient and successful investigators who learn how to target basic research to clinically relevant problems and to develop translational research projects. As a result, our students have presented their research at national and international scientific conferences, published their research in highly respected scientific journals, and have received awards and grants from institutional and external funding agencies. IPHY students are overrepresented in the competitive NIH CCTSI TL1 program, with many leading to successful NIH pre-doctoral awards. Our PhD students have also been highly successful in their subsequent careers, with >95% of our graduates remaining in academia or industry. The current IPHY program director is Mary Weiser-Evans, PhD.

<http://ucdenver.edu/integratedphysiology>

Medical Scientist Training (MSTP)

The Medical Scientist Training Program is a multidisciplinary, inter-institutional MD/PhD dual degree training program educating students in clinical medicine and biomedical research. Its mission is to provide students with the breadth and depth of training necessary to excel as a physician-scientist. Post-baccalaureate students are recruited from a national pool of ~600 applicants, and those selected have proven exceptional talents in research science, a curiosity to solve mechanisms of disease, a drive for discovery, a well-thought-out motivation to pursue a career in medicine. The program was formed in 1983, and in 1992 it received MSTP status with NIH T32 funding (currently ~\$1 million per year to support 16 trainees per year). The program has strong leaders and mentors. Program Director Cara Wilson, MD, is a physician-scientist with a consistent record of NIH research funding and extensive experience in mentoring and career development of trainees. Patricia Ernst, PhD, serves as the pre-clinical associate director and Joe Hurt, MD, PhD serves as clinical associate director. The program has been competitively reviewed and funded by NIH for each of the past five cycles. There are approximately 200 faculty mentors for students to select in 17 PhD programs. There are currently 86 students in the program spanning all years of training. Since 1983, 264 students have matriculated in the MSTP, with 148 having graduated with both degrees in 8.2 years.

Graduates of the MSTP obtain residencies at the nation's elite programs, with ~75% of those who have completed all training now in academic medicine, government (NIH or CDC), or industry, including starting up their own biotech companies. Sixteen MSTP graduates are now faculty on the Anschutz Medical Campus.

<http://medschool.ucdenver.edu/mstp>

Microbiology (MICB)

The Graduate Program in Microbiology at the University of Colorado Anschutz Medical Campus is a PhD granting education and training program designed to prepare students for outstanding careers in science. Through rigorous didactic courses and mentored experimental studies, the program trains students in diverse areas of microbiology, including molecular pathogenesis of viral, bacterial, and parasitic diseases, and the role of the microbiome in human health and disease. Our program provides students with the scientific expertise to become leaders in competitive independent research programs, science education, science policy, and industry. Based within the Department of Immunology and Microbiology, the program faculty includes members of the Departments of Medicine, Neurology, Pediatrics, and Biochemistry and Molecular Genetics. Kelly Doran, PhD, and Breck Duerkop, PhD, serve as the program co-directors and are supported by committees comprised of faculty and student representatives to facilitate advising, admissions and recruitment, evaluations and promotion, and student enrichment and governance. The research interests of the faculty who participate in the Graduate Program in Microbiology include molecular mechanisms of infectious disease pathogenesis, effects of the microbiome on human health and disease, innate and adaptive immune responses to infection, pathogen immune invasion strategies, products and metabolites associated with infectious disease outcomes, regulation of gene expression of both host and pathogen, and development of novel vaccines and therapeutics to prevent or mitigate infectious diseases. Our program has a competitive National Institutes of Allergy and Infectious Diseases Molecular Pathogenesis of Infectious Disease (MPID) T32 training grant, currently in its 20th year of funding. The MPID annually supports four outstanding graduate students working on projects relevant to the molecular pathogenesis of infectious diseases.

<https://www.cuanschutz.edu/graduate-programs/microbiology/home>

Molecular Biology (MOLB)

The Molecular Biology Program at the University of Colorado Anschutz Medical Campus is dedicated to providing rigorous training to its students in a supportive environment. The Molecular Biology faculty are members of 11 departments who are applying the techniques of molecular biology to answer questions in diverse areas at the forefront of modern biology and medicine. The goal of the Molecular Biology Program at CU Anschutz Medical Campus is to equip students for careers at the cutting edge of biological research. The faculty is committed to providing students with the training they need to carry out the highest quality research using state-of-the-art techniques. The teaching philosophy here is to instill the theoretical knowledge and practical experience that enables our students to identify important questions in science, to design experiments that address those questions and to critically evaluate results. Special emphasis is placed on learning to communicate research results to others effectively by participating as featured speakers in the program's seminar series. Previous graduates of the program are now working in academic, government, and industrial biotechnology research, teaching and public policy positions. Molecular Biology Program faculty include members of the Departments of Biochemistry and Molecular Genetics, Cell and Developmental Biology, Medicine, Immunology and Microbiology, Pathology, Pharmacology, Pharmacy, Pediatrics, Craniofacial Biology, Rheumatology, and Obstetrics/Gynecology and include internationally recognized experts in bioinformatics, cancer, cell biology, development, gene expression, genomics, microbiology, molecular structure, and virology. Their diverse interests provide students choice of areas in which to pursue their thesis research. An annual retreat to the Rocky Mountains encourages interaction between students and faculty and familiarizes the students with the research goals and progress of each faculty member. The Molecular Biology Program has been recognized as a Center of Excellence at the CU Anschutz Medical Campus, and was honored to receive a ~\$2 million private endowment, the Victor and Earleen Bolie Scholarship Fund, to support student education, research and training. Along with this funding opportunity, the program continues to be funded by a highly competitive NIH pre-doctoral T32 training grant, currently in year 1 after previous completion of a 20-year NIH pre-doctoral T32. Our students have recently been awarded HHMI pre-doctoral fellowships, along with NSF Graduate Research Fellowships. The program, along with the university, continues in its efforts to increase the number of minority, disabled, and disadvantaged students, with the goal of training them to become important contributors to the biomedical research field and their communities.

<https://www.cuanschutz.edu/graduate-programs/molecular-biology/home>

Neuroscience (NRSC)

The Neuroscience Program (NSP) was formed in the late 1980s as a PhD graduate training program within the Graduate School. The CU Board of Regents awarded the NSP PhD granting status in 1992. The current NSP directors are Abigail Person, PhD, and Nathan Schoppa, PhD. The Neuroscience PhD Training Program at the University of Colorado Anschutz Medical Campus provides multidisciplinary training covering the breadth of neurobiology, from neuronal gene regulation to the development, structure, and function of the nervous system. Students receive training in cellular and molecular neurobiology, neural development, neuropharmacology, and biochemistry, as well as hands-on training in state-of-the-art laboratory techniques. An additional focus is on training in modern quantitative methods to analyze datasets. This aspect begins with a computer programming bootcamp and continues with programming exercises that are integrated throughout the coursework. NSP's goal is to provide a broad and solid foundation of understanding in neuroscience, and to train critical thinkers who identify important problems, generate experimentally testable hypotheses, and who draw significant conclusions from the results of their ongoing research in a specific area of neuroscience. Students completing the requirements for the Neuroscience PhD will be independent investigators prepared to make important contributions to research and to the education of future generations of neuroscientists. The program is closely allied with other departments at the Anschutz Medical Campus, giving students the opportunity to interact and learn from researchers and teachers of many backgrounds.

<https://www.cuanschutz.edu/graduate-programs/neuroscience/home>

Pharmacology (PHCL)

The Department of Pharmacology and the Pharmacology PhD training Program each have a long and well-established history of training biomedical sciences PhD students, medical students, and postdoctoral fellows in the School of Medicine. The NIH-funded Pharmacology pre-doctoral training grant (T32) is one of the longest standing grants of its type in existence. Students enter the training program either directly or via the Biomedical Sciences (umbrella) program or the Medical Scientist Training Program (MSTP). The Pharmacology training program is truly interdisciplinary and interdepartmental with faculty members having primary appointments in departments including Pharmacology, Medicine, Psychiatry, Physiology, Pediatrics, and Biochemistry and Molecular Genetics. Training program faculty are nationally and internationally renowned in the areas of neuroscience, cancer biology, cardiovascular biology, signal transduction, structural biology, and bioinformatics. One of the key defining features of the Pharmacology program training faculty is the highly collaborative and interdisciplinary approach to their work. Laboratories, singularly or in collaboration, frequently use multiple parallel approaches including molecular biology, structural biology, genomics, and informatics and cutting-edge methodologies employing high-powered imaging techniques including optogenetics. Another defining feature of the program is the focus on personalized medicine and translating fundamental benchtop discoveries to clinical practice.

<https://www.cuanschutz.edu/graduate-programs/pharmacology>

Rehabilitation Science (RHSC)

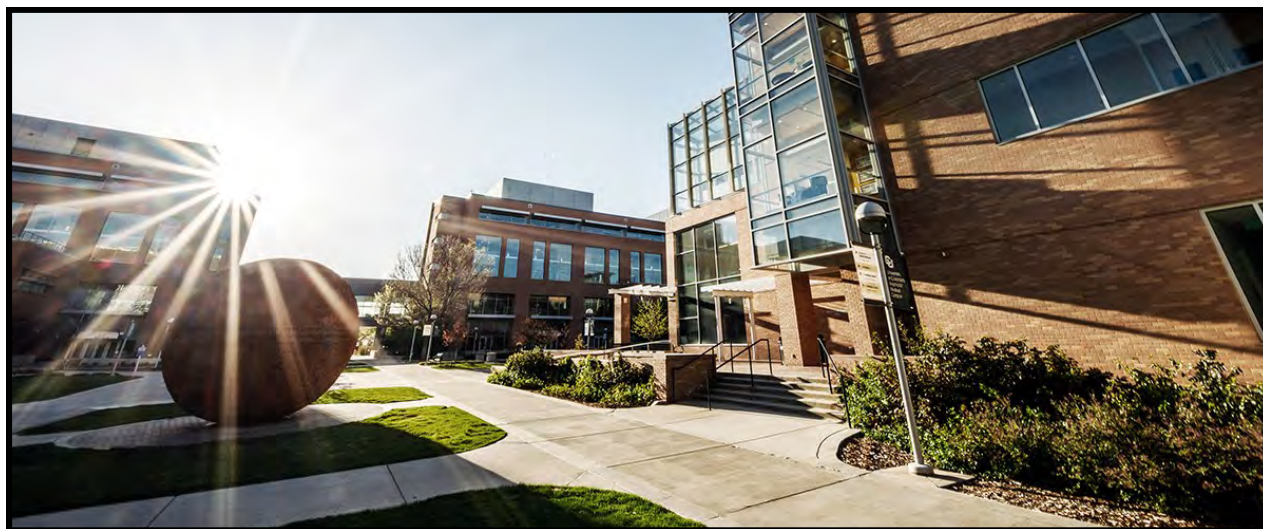
Rehabilitation Science is translational field of study that integrates knowledge from the basic and clinical sciences to improve our understanding of human movement, physical function, and disability across the lifespan. Students receive individual mentorship from nationally recognized rehabilitation scientists in state-of-the-art research facilities, with a customized curriculum to meet the interests of each student. Breadth of knowledge is acquired through foundational coursework in research design, biostatistics, and rehabilitation science, whereas depth of knowledge is gained through elective coursework in one of five areas of specialization: applied cellular physiology, exercise and cardiopulmonary physiology, motor control, biomechanics, and lifespan studies. This approach prepares students to become independent research scientists who integrate knowledge from multiple perspectives ranging from the molecular to the systems level to solve complex problems of physical disablement that will advance clinical practice in the field of physical rehabilitation.

<https://www.cuanschutz.edu/graduate-programs/rehabilitation-science>

Structural Biology and Biochemistry (STBB)

The Structural Biology and Biochemistry Program is interdisciplinary, involving all aspects of biomedical research, particularly macromolecular structure/function, biophysics, proteomics, and metabolomics. It aims to provide students with specialized skills and a solid foundation in biomedical, biophysical, and structural sciences through course work, grant writing, public speaking, and research training. To support the research needs of faculty and students of the Structural Biology and Biochemistry Program, the program makes use of several well-developed core facilities, each specializing in an important facet of biomedical research and essential for the advancement of research and training in Structural Biology and Biochemistry. These core facilities consist of Nuclear Magnetic Resonance spectroscopy (NMR), X-ray crystallography, Mass spectrometry/proteomics, Mass Spectrometry/metabolomics, and Biophysics, and the new CryoEM. These facilities are readily accessible to faculty, graduate students, postdoctoral fellows, and other research staff, and are independently supported. The focus and interdisciplinary nature of the program in Structural Biology and Biochemistry positively influences many other instructional and research programs at the School of Medicine. The Program's educational components support the research in many of the laboratories that require knowledge of the highly technical and specialized structural biology research tools, and this enhances the overall effectiveness and quality of the research and overall research productivity of the campus.

<https://www.cuanschutz.edu/graduate-programs/structural-biology-and-biochemistry>



2020-2021 Deceased Faculty

Dennis Ahnen, MD
Professor Emeritus
Medicine

Lane Craddock, MD
Distinguished Clinical Professor
Medicine

Robert Hodges, PhD
Professor Emeritus
Biochemistry and Molecular Genetics

Robert Allen, MD
Professor Emeritus
Medicine

William Droegemueller, MD
Clinical Professor
Obstetrics and Gynecology

Linda Johnson, DVM
Professor
Pathology

Jerry Appelbaum, MD
Associate Clinical Professor
Medicine

Robert Emde, MD
Professor Emeritus
Psychiatry

William Kaehny, MD
Professor
Medicine

Sol Bassow, Jr., MD
Associate Clinical Professor
Pediatrics

Stephen Goodman, MD
Distinguished Professor
Pediatrics

Mark Laudenslager, PhD
Professor
Psychiatry

William Bernstein, MD
Clinical Professor
Psychiatry

Robert F. Gover, MD
Founder and Director, Cardiovascular
Pulmonary Research Laboratory

Joel Levine, MD
Professor
Medicine

Wilson Bourg, III, MD
Assistant Clinical Professor
Medicine

Anne Hall, MD
Assistant Professor
Pediatrics

Philip Lewis, MD
Clinical Professor
Pediatrics

Randall Cohrs, PhD
Research Professor
Neurology

William Hiatt, MD
Professor
Medicine

Gary Melton, PhD
Professor
Pediatrics

Robert Schrier, MD
Professor Emeritus
Medicine

Robert Shikes, MD
Professor Emeritus
Pathology

Our condolences to the families and friends of our former colleagues.