



Ludeman Family Center for
Women's Health Research
UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

Highlights

JANUARY 2022



From the Desk of

Judy Regensteiner, PhD, Ludeman Center Director and Co-founder

The past several months have been extremely exciting at the Ludeman Center and for women's health and sex differences broadly. In October, we hosted the Annual Community Event, attracting hundreds of people from around the world. This allowed us to share our mission with a large audience and engage them in the research focused on women's health and sex differences. We hope that all viewers will stay connected to us and invest in our mission.

At that event, we announced the newest Early-Career Faculty Research Development Award (seed grant) recipients. This is one of my favorite parts of the Annual Community Event as it is when we formally announce an expansion of our faculty. These seed grants represent opportunity and give these early-career faculty much needed resources to jump start their research. You will see in this newsletter a short description of each researcher. They are the future of the field and philanthropy allows us to continue investing in them.

I also had the privilege of co-chairing a conference on Advancing the Health of Women with the Office of Research on Women's Health. This national conference focused on the key issues in women's health. This congressionally mandated conference brought together eminent scientists to discuss the progress made and the opportunities ahead for our field. The goal is to inform funding levels for upcoming years.

All of this work is made possible because of our outstanding community partners. Thank you for joining us on this journey.

Judy Regensteiner, PhD

Distinguished Professor of Medicine

Judith and Joseph Wagner Chair in Women's Health Research

Director, Ludeman Family Center for Women's Health Research

Director, Women in Medicine and Science

INSIDE THIS ISSUE

2-3 **Announcements**

4-5 **Philanthropy**

6-7 **Impacting Care**

8 **Researcher Spotlight**

9 **Researcher Trainings**

10-12 **Educational Programs**

13 **Supporting Research
and Scientists**

14 **Accolades**

Recent and Upcoming Events

- OCT 5 Annual Community Event Featuring Jennifer Mieres, MD
- NOV 10 Women's Health Research Day Featuring Noémie Elhadad, PhD
- NOV 12 Researcher Information Session: Translation to Impact with CU Innovations
- DEC 9 Let's Talk: Behaviors to Improve Healthy Living across the Lifespan
- DEC 10 Researcher Training: How to Get the Most out of Your Collaboration with a Biostatistician with John Rice, PhD
- JAN 28 Researcher Training: Promotion - New Rules and Key Dossier Elements with Anne Libby, PhD
- FEB 9 Let's Talk: How to Protect Your Heart: The Ins and Outs of Stroke, Cardiac Arrhythmias, and the Connection between Mental Health and Cardiovascular Health
- MAR 5 20th Annual Women's Health Symposium
- MAY 10-11 Ludeman Center Scientific Council Annual Meeting
- OCT 12-14 National Conference on Women's Health & Sex Differences Research

The University of Colorado Anschutz Medical Campus is evaluating all in-person events for the safety of our community. The Let's Talk lecture series and researcher trainings are currently online and will move to in-person once it is safe to do so.

Learn more at www.ludemancenter.org.



Carly Pilius



Devin Lynn

CONGRATULATIONS TO DEVIN LYNN AND CARLY PILIUS

We are excited to recognize Carly Pilius and Devin Lynn who are integral to the operations of the Ludeman Center! Both of them were promoted in September of 2021. Carly, program assistant II, joined the center in 2019, and has significantly expanded her role, taking on greater responsibility in the delivery of many of our programs. Devin Lynn, communications lead, has led several key communications projects since joining the center officially in early 2020. We are so grateful for their major efforts and extensive talents.

LUDEMAN CENTER ADVISORY BOARD:

Margaret Bathgate, Chair	Bill Ernstrom	Katie MacWilliams
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LEADERSHIP:

Judy Regensteiner, PhD, Director	Wendy Kohrt, PhD, Associate Director
Jennifer Broderick Engleby, Deputy Director	Jane Reusch, MD, Associate Director

New Members Join the Ludeman Center's Advisory Board

Two community leaders joined the Ludeman Family Center for Women's Health Research Advisory Board to continue their passion for women's health and sex differences research. Betty Arkell and Bill Ernstrom will be great additions to our outstanding board. We look forward to working with them.



BETTY ARKELL

Betty leverages extensive corporate finance and mergers and acquisitions transactional experience to guide companies through the entire corporate lifecycle, from formation through growth and planned exit. Her

clients include established and emerging growth companies as well as venture capital and other private equity funds.

She works with clients in a variety of industries, including software, technology, telecommunications, analytics, medical devices, healthcare, fintech and manufacturing.

Betty regularly acts as outside counsel to companies and their boards of directors advising on corporate governance issues, strategic plans, equity and debt financings, and mergers and acquisitions. She draws on considerable involvement with community and nonprofit organizations, including membership on numerous boards, to deliver prudent guidance and advice to management teams.



BILL ERNSTROM

Bill has served at Community First Foundation as chairman of the board, board member and community member since July 2004. Bill also serves on the boards of MAIA (a charity that supports the education of

indigenous Guatemalan girls), Rainbow Trail Lutheran Camp (a charity of outdoor ministries) and Juniper Unmanned (a drone services company).

Bill currently works at Faith Lutheran Church in Golden as the Director of Operations. He formerly led the Voyant division of Polycom, Inc. as the division vice president and general manager. Prior to Polycom's acquisition of Voyant, Bill served as founder, CEO and chairman of Voyant Technologies. He holds a B.A. in physics from Hamilton College, a B.S. in electrical engineering from Columbia University, and an M.B.A. from Harvard University.

Bill is a current member of the Ludeman Family Center for Women's Health Research Medicine Cabinet and along with his wife, Janie Hanson-Ernstrom, has been a supporter of the Ludeman Center for many years.



WELCOME DANAEE BOOTH

We are thrilled to announce that Danae Booth has permanently joining the Ludeman Center team. Danae manages the Business Services for the Ludeman Center which focuses on financial and human resource areas. Her professional background includes 28 years in academic settings in various administrative and leadership roles at the University of Colorado but also working in New York City at Weill Cornell Medical College. Originally from Indiana where she received her BA and JD at Indiana University, she has lived in Colorado since 1990. When not in the office, Danae likes to volunteer with senior citizens and work in her large vegetable garden on a small farm in Nebraska.

Advisory Board Generously Supports Faculty During Pandemic

The COVID-19 pandemic affected us all in different and challenging ways. Throughout the past two years, our faculty have navigated changing restrictions — including a near-total shutdown of on campus activity in 2020. This pause resulted in delays in conducting experiments and studies, delaying publications and the gathering of data for larger grants. For many faculty this experience was demoralizing, leaving some to wonder how they would start their research once again. It was also costly as labs still had expenses to cover.

However, these same faculty demonstrated incredible resilience in restarting their work and finding innovative ways to continue research outside the lab. In the past two years, Ludeman Center scientists have remained extremely productive and have furthered the field of women’s health and sex differences.

In July 2021, many Ludeman Center Community Advisory Board members and The Anschutz Foundation came together to raise funds for a COVID Supplementary Grant. In total, the Ludeman Center provided 12 supplementary grants totaling \$180,000 to Ludeman Center faculty studying women’s health or sex/gender differences. The notes that follow show the impact of this philanthropy.

PLEASE ACCEPT THIS BRIEF NOTE OF THANKS for funding our COVID supplement grant. It was a great honor to be awarded the Junior Faculty development grant in 2020, but unfortunately due to COVID restrictions, challenges with animal models, and family and childcare disruptions during the pandemic, we did not complete all of our objectives thus far. Nonetheless, we worked hard with the available resources and have made some important findings, namely that estrogen can indeed modify how microglia-the specialized cells that play a key role in the development of Alzheimer’s disease-function. This has important implications for designing AD therapeutics and receipt of the COVID supplement will allow us to validate these findings in mouse models.

On a more personal note, thank you to the board for your continued investment in my research program and career development. This has been a challenging year. This supplement, and your continued support, means a great deal.

I really look forward to sharing more findings from our work with you soon.

Best wishes,
Assistant Professor, Endocrinology

THANK YOU SO MUCH FOR YOUR GENEROSITY. I am thankful to have just been awarded a COVID Supplemental Grant. I have greatly benefited from the generosity, training and support of the Ludeman Family Center for Women’s Health Research. I am a junior faculty member and Pediatric Endocrinologist. I have previously received a Seed Grant and was a BIRCWH Scholar. I have had many amazing mentors through the center, including Drs. Regensteiner, Zeitler, Nadeau, Moreau, Kelsey and Green. I received my first big NIH grant in the middle of COVID. I am also a mother to two young children. This last year has been hard as research was shut down for nearly a year and my kids were in and out of childcare. All of my research studies have now restarted and are recruiting. The supplemental grant I just received will help me pay for a full-time research coordinator to assist with all aspects of research in this upcoming year. I am looking forward to more in person events and to see you all in 2021 and 2022!

Many thanks,
Assistant Professor, Pediatric Endocrinology

"In the past two years, Ludeman Center scientists have remained extremely productive and have furthered the field of women’s health and sex differences." ASSISTANT PROFESSOR, PEDIATRIC ENDOCRINOLOGY

I WOULD LIKE TO EXPRESS MY DEEP GRATITUDE for your constant support of the Center scientists, including myself. As a mid- career/senior scientist there were no opportunities for COVID- 19 supplementary funding, and as such, I am beyond appreciative for being awarded a COVID-19 Supplementary Recovery Grant.

It has been a challenging and stressful year with the COVID-19 pandemic. We were making excellent progress on our research project and were on track to complete it in late 2020/early 2021, but the research suspensions because of COVID-19 stifled all momentum. We had 13 active participants at the time and only 5 were willing to continue the study once research was able to resume. Additionally, we lost critical research staff that were instrumental in keeping the research going. We have not been able to replace the research staff due to dwindling grant dollars from supporting personnel costs during the suspension and thus, we have been operating on a “shoe-string” budget so that we can complete enrollment this year. This has shifted a lot of the administrative work (recruitment, pre-screening,

scheduling, OnCore/Epic, IRB, etc.) that would otherwise be conducted by a research assistant onto the shoulders of myself and my postdoctoral fellows. This administrative burden has prevented us from conducting data analyses and submitting manuscripts and the competitive renewal for this NIH R01 project. Thus, the Ludeman Center COVID-19 supplementary funds will be used to support services provided by the Clinical Research Support Team (CReST) to assist with this administrative burden so that we can complete enrollment of the remaining participants in a timely fashion. We will also use some of the funds to cover costs associated with replacing the necessary lab reagents for our bench work that we had to dispose of during the suspension.

Again, I want to express my sincere thanks to the Board and other funders for their generosity that made this supplementary funding possible, and to Dr. Regensteiner and other senior leadership at the Ludeman Center for their constant support.

Warm Regards,
Professor, Geriatric Medicine

NIH Response to Congressional Request on Women's Health Research

The NIH Office of Research on Women’s Health (ORWH) organized and hosted a virtual conference entitled Advancing NIH Research on the Health of Women: A 2021 Conference on Oct. 20-21. This conference was in response to a congressional request to address NIH efforts related to women’s health research. Dr. Judy Regensteiner co-chaired the conference at the request of the ORWH and has spent the last several months working with this group to review women’s health research being funded through the NIH. During this conference, speakers addressed three key topics: (1) clinical practices related to rising maternal morbidity and mortality rates; (2) increasing rates of chronic debilitating conditions in women; (3) stagnant cervical cancer survival rates. In addition to co-chairing the conference, Dr. Regensteiner moderated the Chronic Debilitating Conditions in Women session. In addition, several members of the Ludeman Center Scientific Council participated. Over 600 people attended the conference which will lead to recommendations about women’s health and sex differences research.

Impacting Care Through the Ludeman Center Network

By Amy Huebschmann, Ludeman Center Lead Scientist



At times, opportunities for the Ludeman Family Center for Women's Health Research to have an impact on health occur rapidly, such as when there are shifts in healthcare delivery policies and procedures. That was the case in December 2020, amid a COVID-19 pandemic surge, when UHealth received a mandate to start using a new laboratory assay to measure the early signs of a heart attack in patients – the 'troponin' laboratory test. The relevance to the Ludeman Center is that this new laboratory assay for the troponin test is one of the first tests to recommend different normative values for men and women. This shift in assay was expected by mid-2021, but the timeline rapidly accelerated as the supply line for the old troponin assay was shut down sooner than expected. Physician leaders in cardiology and emergency medicine at UHealth were tasked to quickly update and approve the protocols for use of the new laboratory test, as well as train their clinical staff to use them. This type of shift usually takes several months to accomplish, but the team only had a few short weeks to meet the transition date when the old troponin assay would no longer be available, and the new assay must be used.

The rationale for sunsetting the old test assay reflected an international shift among health systems to use newer troponin assays that have a higher sensitivity for identifying heart attacks. The main advantage of these high-sensitivity assays is that a negative test provides greater reassurance that a patient is not having a heart attack, and this greater reassurance allows emergency department clinicians to safely discharge patients earlier and limits the number of

patients who require additional diagnostic procedures that are sometimes invasive.

As part of improving the performance of the troponin assay to be more sensitive to heart attacks, consideration was given to developing sex-specific cutoffs of 'normal' values for men and women. The troponin assay is one of the first tests to create these sex-specific cutoffs. The rationale for these cutoffs is that the 'normal' level of troponin enzyme circulating in the bloodstream is lower for women than it is for men. Accordingly, a 'high' value in women (15 ng/L) is significantly lower than a 'high' value in men (20 ng/L). However, making a clinical diagnosis of a heart attack goes beyond this simple 'high' or 'low' initial reading. This is because several other conditions may cause mild, chronic elevations in the troponin test, such as chronic heart failure and chronic kidney disease as well as other cardiovascular risk factors. In contrast, during a heart attack, the troponin levels will rise precipitously as that enzyme is leaked from a person's heart muscle that is lacking adequate blood flow. Thus, it is the time trend of rising troponin levels that is consistent with a heart attack. The implementation of an emergency department protocol for this new troponin assay needed to pick cutoff values that would provide a good 'signal-to-noise' assessment with consideration of sex differences not just for the baseline initial test, but also for what signifies a clinically important change in troponin level over time for women as compared to men. Although the population-level norms for 'high' value in women and men at baseline were fairly well-established by the manufacturer, the guidance on sex-specific differences

in time trends for troponin levels had been generated in a few small studies as of December 2020, offering less guidance on the appropriate thresholds for the Denver metropolitan population.

A small team of clinicians were tasked with updating these protocols – including **Larry Allen, MD**, associate head of clinical affairs at the CU Division of Cardiology, **Karen Ream, PA**, and **Todd Clark, MD**. Their specific task was to work together to incorporate the information about troponin tests into the decision-making process for the new test for the Emergency Department and Cardiology inpatient service, including decision trees (aka 'pathways') used regularly by clinicians in the UHealth Emergency Department. These pathways need to be accurate, but not overly burdensome for use by time-pressured clinicians.

As the Cardiology and Emergency Department leads worked with the UHealth communications team to alert clinicians to the coming changes, **Amy Huebschmann, MD**, researcher at the Ludeman Family Center for Women's Health Research, contacted Dr. Allen about the troponin cut-off transition. Input from other colleagues around the country on best practices for implementing these new assays was critical to developing the most appropriate protocols on a warp-speed timeline, so Dr. Allen encouraged Dr. Huebschmann to leverage the Ludeman Center's existing network of international experts in sex differences in cardiovascular disease.

Dr. Huebschmann and Ludeman Center Director **Judy Regensteiner, PhD**, quickly reached out to the Ludeman Center Scientific Council, a nationally recognized advisory group of scientists, and summarized their expert input for the UHealth team. Next, Dr. Allen, Ms. Ream, Dr. Clark, and their team incorporated this information into their existing environmental scan of the potential cutoff thresholds to use and worked quickly to update the decision tree protocols in a way that incorporated sex differences more appropriately.

The result of this revision is that the new troponin lab tests and decision pathways will help to diagnose heart attacks in a way that accounts for sex differences and that follows best practices in the field. This should translate into missing fewer heart attacks over time, particularly for women whose heart attacks have traditionally been underdiagnosed.

Today, the team at UHealth is working to understand the effects of the new assay and the protocols. They are reviewing how well the current pathways have performed in our Emergency Department, as well as reviewing the scientific literature that now includes larger clinical trials than when they had to implement the new troponin assay in December 2020. The UHealth team is using the new data to revise their pathways, so that they can continue to improve the early diagnosis of heart attacks for women and men.

Women's Health Research Day



Noémie Elhadad, PhD

The Ludeman Center held Women's Health Research Day on November 10 featuring keynote speaker, Noémie Elhadad, PhD. Dr. Elhadad is an associate professor of biomedical informatics and vice chair for research at Columbia University. Her research interests lie at the intersection of machine learning, natural language processing, and medicine, with the goal of impacting healthcare and the health of patients using big data approaches.

Her keynote suggested that **artificial intelligence, especially when developed in a human-centered fashion, can tackle challenges, generate new knowledge, and support the care of women.** Her presentation focused on three projects: individualized modeling of menstruation learned from two million self-tracked cycles; Citizen Endo, a citizen-science project together with 15,000 individuals to phenotype and manage endometriosis through mobile health and machine learning; and a study of gender differences in disease diagnosis across 100 conditions and 200 million individuals in the United States.

Dr. Elhadad's work shows great promise for the use of big data to learn more about and eventually positively impact women's health.

Males Have Been the Standard: Integrating Females into Studies

A conversation with Amy Keller, PhD, Ludeman Center scientist

When **Amy Keller, PhD**, started gathering preliminary data with hopes of conducting a larger study, she used a cohort of male rats. Her intention was to use these data to create a larger study that used both male and female rats to understand sex differences. "I wanted to see if the study would work. Looking back, I've decided that I will now just start with female rats for studies instead," said Dr. Keller. By studying female rats first, she can immediately take into consideration the importance of female health and hormones. This is an important shift in medical research that has taken place in the last several decades.

"Female animal models were avoided for so long that males became the default," said Dr. Keller. "Between the National Institutes of Health (NIH) mandate and efforts from the Ludeman Center, this mindset is changing. I believe that the Ludeman Center is a beacon for this change."

In 1994, the NIH created a policy in the Inclusion of Women and Minorities as Subjects in Clinical Research. This policy mandates that all NIH-funded research must address plans for the inclusion of women and minorities in the research grant application. The Ludeman Center is taking this further at the CU Anschutz Medical Campus to encourage faculty to actively participate in women's health and sex differences research.

Starting Research in Sex/gender Differences

Dr. Keller's primary mentor is **Jane Reusch, MD**, associate director of the Ludeman Center, who encouraged her to apply for a Ludeman Center Early-Career Faculty Research Development Award. "I always knew I wanted to incorporate sex differences into my research," said Dr. Keller. "It was just a matter of gathering initial data for a strong grant application." When Dr. Keller first launched her research program,

she was focused on gathering preliminary data to show that the idea could work. "There are so many considerations when starting research and I didn't want to start with a large cohort of animals if the research ultimately did not work out," said Dr. Keller. Her initial research looked at just six rats in order to get pilot data.

When Dr. Keller decided to apply for a Ludeman Center Early-Career Faculty Research Development Award, it was for her research bringing medicinal plants into

treatments for patients with diabetes and cardiovascular disease. Current research shows that many people with type 2 diabetes will ultimately succumb to cardiovascular disease. Dr. Keller hopes to find interventions to improve the cardiovascular health of these patients by either preventing or creating new therapies to treat cardiovascular disease.

The pilot funding she received from the Ludeman Center allowed her to study rodent models at thermoneutrality and at room temperature, and then compare their cardiovascular health.

Thermoneutrality is the temperature where animals do not have to use calories to keep their body temperature stable. For rats, this temperature is higher than for humans, so she kept them in a space at approximately 84 degrees F. Doing this allowed Dr. Keller to analyze the baseline cardiovascular health of the rats. The test group was then kept at colder temperatures so she could test the differences in vasculature at these separate temperatures. Dr. Keller now plans to use plant compounds to try to improve cardiovascular health in the rats with the goal of using these interventions in humans.

Dr. Keller hopes to continue this work and recently applied for a large research grant through the VA and NIH. This application was possible because she gathered initial data through her pilot funding at the Ludeman Center.



Amy Keller, PhD



The Importance of Mentorship

Mentorship has been instrumental in Dr. Keller's career. When she first started researching medicinal plants, she noticed that certain compounds seemed to be helpful in treating diabetes. When she tried to publish her first paper on the topic, it was rejected because the study did not include enough information about possible mechanism. "I learned that in order for this work to be taken seriously in western medicine, I needed sophisticated research models. My primary mentor, Dr. Reusch, has been instrumental in helping transform me into a more rigorous scientist," said Dr. Keller. "She is the best mentor I've ever had. Dr. Reusch is dedicated and invested in the success and wellbeing of all her mentees."

Dr. Keller is originally from Wheat Ridge, CO, and received her PhD from City University of New York in plant sciences. She has been part of the CU Anschutz Medical Campus since 2011 when she joined Dr. Reusch's lab as a postdoc. "The quality of the people at CU Anschutz is great. People here are at the top of their fields and productive professionally but also have hobbies and other non-work activities," said Dr. Keller. She is especially grateful to the Ludeman Center for providing funding, mentorship and education to her for the past several years. "The Ludeman Center provides training on topics that are important, but that I've never been trained on. Speakers who present on topics such as budgeting, lab management and more are extremely helpful."

Researcher Trainings

The Ludeman Center invests in scientists by providing monthly researcher trainings on a variety of topics designed to help scientists hone and sharpen their research, grants management, communications and other academic and career development skills. The trainings are essential to researchers furthering their careers.

Career Mapping: Using Signature Stories to Clarify Mission/Vision/Goals

MARCH 2021 – **Anne Libby, PhD**

Participants built and shared structured narratives about their mission/vision/goals.

Networking with Members of the Ludeman Center Scientific Council

APRIL 2021 – **Amy Huebschmann, MD**

Participants engaged in a lively discussion between the Ludeman Center Scientific Council and Ludeman Center researchers.

Performance Management: What To Do When a Staff Member of a Research Group Isn't Meeting Expectations

MAY 2021 – **Janine Higgins, PhD**

Approaches and strategies to deal with underperforming staff members were presented.

Basic Concepts of Sex as a Biological Variable

JUNE 2021 – **Virginia Miller, PhD**

Dr. Miller, shared expertise in doing research that includes sex as a biological variable as well as considerations in research and grant applications for gender, a psychological, behavioral and social construct.

Grants Administration Basics: Requirements of the PI, Budgets, and Expense Reconciliation

JULY 2021 – **Tim Lockie, MBA**

Basic cost principles, budget templates, guidelines for budget management, financial reporting requirements, and auditing were covered.

NIH Grants 2021: Update to NIH Biosketch and Other Support Documents and COVID-related Grant Proposal Considerations

AUGUST 2021 – **Jennifer Kemp, PhD**

Dr. Kemp covered new NIH rules for biosketches and other support pages and also discussed special considerations in grant writing after the pandemic.

SEPTEMBER 2021 – **Researcher Networking Social**
Postponed due to COVID

OCTOBER 2021 – No training scheduled due to two researcher events in November

Translation to Impact

NOVEMBER 2021 – **Kimberly Muller, Esq**, and **Heather Callahan, PhD, JD, EMBA**

Researchers learned how the Ludeman Center and CU Innovations can support their work and enhance women's health by translating discoveries from laboratories to patients.



Jennifer Mieres, MD

Community Comes Together and Receives Heart Health Tips

On October 5, **Jennifer Mieres, MD**, senior vice president of Northwell Health's Center for Equity of Care and expert in nuclear cardiology and cardiovascular disease in women, shared heart smart tips to improving health at the **2021 Annual Community Event**. The event is the signature community outreach program for the Ludeman Family Center for Women's Health Research. Every year, hundreds of people gather to learn more about women's health and sex differences research. This year, due to COVID-19 restrictions, the event was hosted via livestream.

Dr. Mieres' talk centered on six strategies to improve cardiovascular health and the disparities facing women today. "The disturbing factor is that we are on the verge of reversing all the progress made," said Dr.

Mieres. "There is still a need to customize the message and raise awareness among our black women, our Latina women and South Asian women because they have a higher burden of cardiovascular disease."

"A 2021 landmark publication published in the Lancet from a group of cardiovascular disease experts around the world highlighted the state of women's cardiovascular health," said Dr. Mieres. "The headline says it all 'all of women's health needs are worthy of attention'. They highlighted that 35% of deaths in women worldwide are caused by cardiovascular disease." It demonstrates that more research and community outreach is necessary to better prevent and treat cardiovascular disease in women around the world. "The publication issued a call to action calling cardiovascular disease among women understudied, under-recognized, underdiagnosed and undertreated," said Dr. Mieres.

"There is still a need to customize the message and raise awareness among our black women, our Latina women and our South Asian women because they have a higher burden of cardiovascular disease."

Passion to Reduce Disparities in Care for Women

The event also showcased the latest recipients of the Early-Career Faculty Research Development Awards from the Ludeman Center. "Highlighting our seed grant recipients is more than just announcing names," said **Jane Reusch, MD**, associate director at the Ludeman Center. "It demonstrates new ideas that are being invested in. It represents early-career investigators who now have the resources to take chances and pursue innovative research. These \$25,000 grants allow researchers to gather preliminary data to enable them to apply for subsequent larger grants."

Highlighting the successes of the Early-Career Faculty Research Development Awards was **Prateeti Khazanie, MD**, assistant professor in the Division of Cardiology. Dr. Khazanie focused her talk on



Prateeti Khazanie, MD

the disparities between women and men in receiving life-altering care when experiencing cardiovascular disease. "Most women are told they are short of breath for anxiety or other reasons," said Dr. Khazanie. Women are less likely to receive specialized cardiovascular care and are

also less likely to receive heart transplants and left ventricular assist devices (LVADs). Dr. Khazanie noted, "Women are grossly undertreated for receiving heart failure treatment, so it became my life's passion to reduce some of those disparities."

Continued Investments in Women's Health and Sex Differences Research

"Encouraging women and underrepresented communities to engage in health will improve the health of our communities," said **Donald Elliman**, chancellor of the CU Anschutz Medical Campus. "We all know heart health is important but understanding risk factors and simple strategies to improve cardiovascular health can help us improve outcomes." In total, the Annual Community Event raised over \$475,000 for the operations and critical programming provided by the Ludeman Family Center for Women's Health Research. **"The seeds we plant are growing into larger projects and changing prevention strategies, diagnosis, treatment and care to improve the health and wellbeing of women and men across the lifespan,"** said **Judy Regensteiner, PhD**, Ludeman Center director and co-founder.

Benefactors, We Thank You!

PRESENTING



LEADING

The Brown Family

Cindy & Dan Caruso



MENTORING

Margaret & Steve Bathgate
Maureen & Alan Bird
Nan & Spike Eklund
Cathy & Graham Hollis
Patti Klinge & Connie McArthur
Jim & Patience Linfield

Betsy & Peter Mangone
Sharon & Lanny Martin
Jan & John Meck
Catherine & Ray Petros
Nancy Tankersley
John Daily
Judith B. Wagner



SUSTAINING

Betty Arkell
Steve Bathgate
Nancy Benson
Bill Ernstrom &
Janie Hanson-Ernstrom
Cathy & Mark Hart
Eileen Honnen-McDonald
Wendy Kohrt

Brenda & Don Lewis
Katie MacWilliams
Nan Odell
Judy Regensteiner
& Ken Schneider
Betsy Wagner
Jane & Jay Reusch
Nan & Hugh Williamson



ADVOCATE

Laura & Stephen Brown
Toni Cohig

Chris Engleby
Thomas Engleby

VIP

Neill Epperson
& Steve Berkowitz

Lisa Schrag
Mary & Charles Stuart



Let'sTalk: Conversations about Women's Health

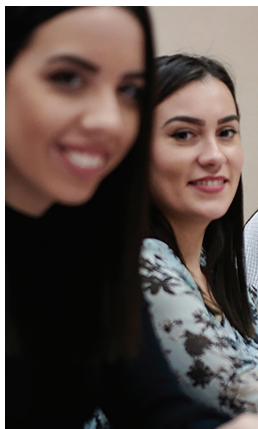
In partnership with UHealth, this lecture series presents relevant health information to the community. Nationally renowned physicians, researchers and experts share evidence-based tips to improve health. For more information or to view past lectures, visit ludemancenter.org.



APRIL 2021

Infectious Diseases: Awareness, Prevention and Protection

This Let's Talk event titled *Infectious Diseases: Awareness, Prevention, and Protection* featured infectious disease experts **Michelle Barron, MD**, **Andres Henao Martinez, MD**, and **Thomas Campbell, MD**, sharing their expertise with the community. This well-attended virtual event highlighted the role of women scientists in contributing to the fight against infectious diseases, addressing safety concerns about infectious disease while traveling, and the latest updates on the COVID-19 vaccines, including key sex differences.



MAY 2021

Exploring Healthcare Careers for High School-Aged Girls

One of the highlights of the Ludeman Center community programs each year is *Exploring Healthcare Careers for High School-Aged Girls*, where we host 50 girls on campus for a full day, inside-look at a variety of careers in healthcare. Since we were not able to gather on campus this year, the event was modified to a virtual Girls' Career Hour. Girls from across the state learned about careers in research, diabetes care, neonatology, psychology and nursing from Ludeman Center scientists **Drs. Jane Reusch, Laura Brown, Elissa Kolva, and Teri Hernandez**.



DECEMBER 2021

Behaviors to Improve Healthy Living across the Lifespan

This Let's Talk lecture series focused on *Behaviors to Improve Healthy Living across the Lifespan*. **Scott Cypers, PhD**, provided extremely helpful information about how families can effectively cope with stress and anxiety. **Drs. Megan Kelsey and Amy Huebschmann** presented excellent tips for establishing and maintaining behaviors for healthy eating and exercise in children and adults respectively. They also discussed the role of parents and grandparents in modeling healthy behavior and providing guidance for children and teens.

Congratulations 2021 Seed Grant Recipients!

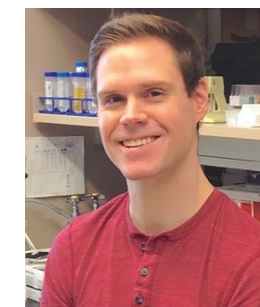
One of the most exciting times of year is when we welcome new early-career faculty to the ranks of Ludeman Center researchers. This year, we awarded seed grants to six faculty through a competitive peer-reviewed grant process. We are thrilled to have them join the Ludeman Center and we look forward to featuring them and their work, while helping them accomplish their research goals. These seed grants are made possible through the generosity of our community and investments from the School of Medicine.



Lyndsey DuBose, PhD
Role of Estrogen Deficiency on the Vascular Contribution to Alzheimer's Disease in Women



Stephanie Gilley, MD, PhD
Sex Differences in the Responses to Diet in Utero



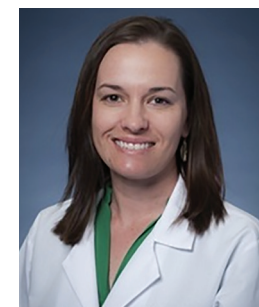
Andrew Libby, PhD
The Impact of Fat Cells on the Development of Liver Disease after Loss of Ovarian Function



Christina A. Metcalf, PhD
Stress Mechanisms Underlying Childhood Adversity Effects on Cognition and Mood in Menopause: Colorado Research on Menopause & Early Life Stress Remote Participation Study



Ana J. Pinto, PhD
Understanding the Mechanisms Underpinning Sex Differences in Glycemic Responses to Active Breaks in Sitting in Adults at Risk of Developing Type 2 Diabetes



Stacy Trent, MD, MPH
The Effect of Novel Testing Technology in Diagnoses of Heart Attack and Cardiac Risk Scores in Women



KC Woulfe, PhD
We also announced this year's recipient of the **Jacqueline Leafer Wish for the Heart Award**

Made possible through the generosity of

The Anschutz Foundation

Jacqueline Marie Leafer Foundation

Jeanne Land Foundation

Ludeman Family

University of Colorado School of Medicine

Researcher Accolades



Christine Swanson, MD



Petter Bjornstad, MD



Kristen Nadeau, MD



Anne Lynch, MD, MSPH



Sarah Perman, MD

*Congratulations to Ludeman Family Center
for Women's Health scientists!
Great work and we are very
proud of you!!!*

Christine Swanson, MD, received the 2021 CU Department of Medicine Outstanding Early Career Scholars Program Award. Her work focuses on the skeletal effects of insufficient sleep and night shift work. Dr. Swanson also received a R01 grant from the National Heart, Lung and Blood Institute to continue her work on bone metabolism, density and microarchitecture with regards to shift work.

Petter Bjornstad, MD, received the Juvenile Diabetes Research Foundation's Dr. Robert Goldstein Award. He has also been awarded an R01 grant from the National Institutes of Health to research kidney health in adolescents with obesity and pre-diabetes. Dr. Bjornstad is also the recipient of several additional grants including an NIH Subaward of Treatment Alternatives in Pediatric Type 2 Diabetes; NIH Subaward of Teen Longitudinal Assessment of Bariatric Surgery and a Juvenile Diabetes Research Foundation Strategic Research Award.

Kristen Nadeau, MD, was awarded the **American Diabetes Association 2021 Outstanding Scientific Achievement Award** as well as the Juvenile Diabetes Research Foundation's Mary Tyler Moore and S. Robert Levine, MD, Excellence in Clinical Research Award.

Anne Lynch, MD, MSPH, received a grant from the National Eye Institute to study the relationship of systemic inflammation with age-related macular degeneration progression and develop an inflammatory biomarker for patients.

Sarah Perman, MD, received an Emergency Medicine Foundation Mid-Career Award.

INVESTING IN RESEARCH
Sedentary Behavior and Women's Heart Health

When the Ludeman Center was first founded, we made early-career research a central element to our mission. The Early-Career Faculty Research Development Awards allow us to help scientists launch research in women's health and sex differences. It also helps keep these talented scientists engaged in medical research, building a pipeline of professionals for generations. Mary Whipple, PhD, received a Ludeman Center seed grant for her SitWise study to better understand the relationship between sedentary behavior and cardiovascular health in women with type 2 diabetes.

9 HOURS Middle age and older Americans spend an average of 9 hours every day sedentary. Adults with type 2 diabetes engage in sedentary behavior approximately three more hours per week. Sedentary behavior even negatively impacts the health of physically active individuals by increasing the risk of type 2 diabetes, cardiovascular disease and death.

SITWISE STUDY The SitWise study aims to better understand sedentary behavior as it relates to cardiovascular health for older women with type 2 diabetes. The study is using in-depth interviews and activity monitors.

LONGTERM GOALS Dr. Whipple hopes that her research will lead to further studies to design interventions targeting sedentary behavior – encouraging individuals to spend less time sitting and engage in more physical activity. This will enable women with type 2 diabetes to live healthier lives.

IMPORTANCE OF EARLY-CAREER FUNDING The Ludeman Center provides funding to early researchers to help them launch research programs in women's health and sex differences. This important early-career funding allows researchers to gather preliminary data and work toward garnering additional funding – taking their ideas to the next level.

Judy Regensteiner, PhD, Named Distinguished Professor



The CU Board of Regents recently named 11 faculty members across all campuses as University of Colorado Distinguished Professors. We are thrilled to announce that Judy Regensteiner, PhD, is among them! This well-deserved recognition is the highest honor awarded to faculty across the CU System.

Dr. Regensteiner is a tenured professor, holds the Judith and Joseph Wagner Endowed Chair in Women's Health Research and co-founded the Ludeman Family Center for Women's Health Research. She is a pioneer in women's health and sex differences and has been instrumental in building the field of women's health and sex/gender differences research on the Anschutz Medical Campus. She has over 170 publications in peripheral artery disease, cardiovascular consequences of type 2 diabetes and women's health and sex/gender differences. She also mentors many junior faculty and is deeply dedicated to Ludeman Center scientists as well as the Advisory Board of the Ludeman Center. She has served as a mentor for 30 junior faculty and postdoctoral fellows in just the past five years. Her publications represent an important addition to the body of knowledge and the effects of her leadership, research and dedication to early-career scientists will be felt for generations.



**Ludeman Family Center for
Women's Health Research**
UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

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Let's Talk:

Conversations about Women's Health



Let's Talk: Conversations about Women's Health is a lecture series that educates the community on topics of health. These evidence-based talks provide information that people need to make educated decisions about health for themselves and their families. Let's Talk content is uniquely created and presented by a panel of nationally-renowned subject matter experts, physicians and researchers.

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