Human Immunology & Immunotherapy Initiative (HI^3)
SCHOOL OF MEDICINE
UNIVERSITY OF COLORADO **ANSCHUTZ MEDICAL CAMPUS**

July 2020

Hello! We hope you have all been staying safe and healthy during this uncertain time.
Below you'll find the latest ideas, action items, and news on the progress of the Human Immunology and Immunotherapy Initiative, particularly in response to the SARS-CoV-2/COVID-19 pandemic.

HI3 Community Activities in Response to COVID-19

The HI3 community in involved in a variety of activities related to the COVID-19 pandemic. Listed below are ongoing efforts that are known to the HI3 directorate and their leaders:

- Central repository for COVID-19 samples, Rosemary Rochford
- Commercial SARS-CoV-2 ELISA testing (CLIA), Vijaya Knight
- In-house ELISA development (CLIA), Ashley Frazer-Abel
- Health Care Worker and Community Sero survey, Kevin Dean
- In-house SARS-CoV-2 assay, Barbara Davis Center, Liping Yu
- In-house flow/bead based assay, Ross Kedl
- COVID-19 HLA association studies, Paul Norman
- Point of care test for SARS-CoV-2 antigens, John Cambier with Quidel Corporation

HI3 Human Immune Monitoring Shared Resource (HIMSR)

Mission: To facilitate and support human immunology research and discovery

Reopening

The Human Immune Monitoring Shared Resource (HIMSR) participated in the first wave of core re-openings on campus! In support of the campus-wide effort to flatten the curve, only a skeleton crew has been in the HIMSR lab for the last several weeks. Some operations have been mission critical to COVID research (elaborated on below), but the majority of the staff time has been busy at home catching up on many data analysis projects, writing papers, and grants. As HIMSR activities pick up, social distancing and special precautions will be followed to contribute to the safety of our community, but we do look forward to working with you again, even if by phone or zoom. Please check the updated website to be reminded of the long-provided HIMSR services and to see the new ones.

Update on HIMSR activities, samples from COVID+ patients

HIMSR has been very involved with campus-related COVID-19 activities. With the support of the Vice Chancellor of Research (VCR) and anticipated support from CCTSI, HIMSR has opened BSL2+ lab space to process blood from COVID-19+ patients. They anticipate that this space will facilitate their catalogue of services well after the pandemic, making it possible to process human samples from patients with most conditions. They have worked closely with Rosemary Rochford, Tem Morrison, Elena Hsieh, Tom Flaig and the office of the Vice Chancellor of Research (VCR) to open the COVID Biobanking Protocol. The Institutional Biosafety Committee expedited their assistance to ensure the staff are safe and compliant. JC Haller in the Department of Immunology/Microbiology helped to organize the BSL2+ space. And now, by working with Adrie van Bokhoven, the co-Director of the Tissue Biobanking and

Histology Shared Resource, HIMSR is obtaining de-identified remnant and prospective samples from COVID-19+ patients. They are processing and aliquotting these samples into plasma, PBMC, RNA, and DNA aliquots. The samples are then going back to Adrie and his team for banking. The VCR and CCTSI are supporting a COVIDOME project to generate omics data from these samples (see trisome.org for an example of this vision), which will be made broadly available. Those on campus who need samples for other experiment should send their proposals to the Sample Allocation Committee who will decide who will use them.

Other Headlines from HIMSR

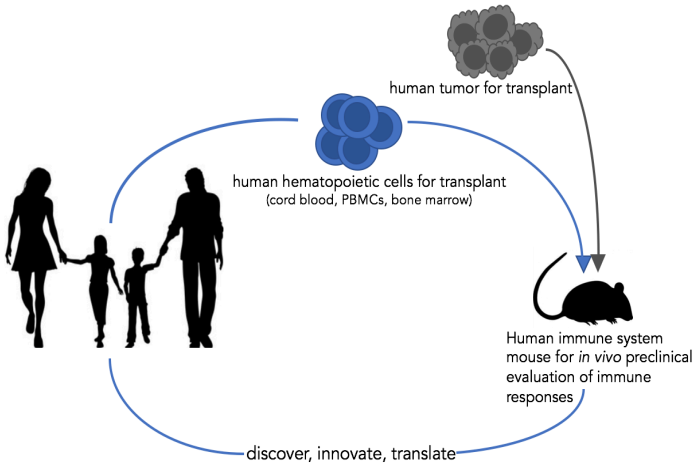
- The HIMSR is now grateful to be officially a University of Colorado Cancer Center Core—as of July 1, 2020. The good news is the Cancer Center's subsidies will contribute to lower HIMSR prices campus wide and to Cancer Center members.
- **The Multiplexed Ion Beam Imaging (MIBI) technology is ready for projects**. Imagine using a 27-marker panel to analyze your FFPE tissue microarray! Analysis solutions are in place. Please contact Kim Jordan and see her presentation for more details.
- The Vectra User Group meeting resumed on June 4 (please contact Kim Jordan if you would like to be added to this list).
- Questions about HIMSR services or the inclusion of HIMSR services in your next grant application? Contact Kimberly.Jordan@cuanschutz.edu

NAME CHANGE! HI3 Pre-clinical Human Immune System Mice (PHISM) Shared Resource

NOTE: formerly Translational Research Networking and Preclinical Models (TRNPM)

Mission: To provide a nexus for multiple aspects of translational immunology research

- PHISM offers Human Immune System "humanized" mice as a pre-clinical model:
  Hu-CB-BRGS mice - Injection of human hematopoietic stem cells isolated from umbilical Cord Blood into immunodeficient BRGS (Balb/c, Rag2$^{-/-}$ IL2R C$^{-/-}$SIRP ^{NOD}) newborns. Human B, T and myeloid cells develop and are tolerant of host.
  Hu-PBL-BRGS mice - Injection of human peripheral blood cells into adult BRGS mice. Reconstitution is activated T cells that induce GVHD over 4-6 weeks.
- Immune analysis is performed by flow cytometry or ELISA or custom assays. Human tumors, such as cells lines or PDXs, can grow in these immunodeficient mice. Custom recipients are available upon request, such as NSGS or NSGW41 mice that are capable of developing a more robust myeloid lineage or NSG-IL15 mice that develop functional, mature NK cells.



Utilization of human immune system (HIS) mouse models for preclinical testing

With these HIS models, investigators have studied combination immunotherapy treatments to a variety of human tumors, immune responses to human pathogens and the development of the human immune system. The PHISM also has the ability to perform CAR-T cell studies by developing CAR-T cells from the HIS mice.

- Interested in using human tissue of immune relevance for your research? **PHISM has an approved COMIRB protocol that can provide regulatory approval to HI3 investigators for their human tissue studies**. This protocol allows investigators to obtain fresh (adult or pediatric) human tissue of immunological relevance upon donor consent or as medical waste (depending on the origin of the tissue). At present, the tissue approved on the protocol includes blood, tonsils, bone marrow, bone and associated marrow, lymph nodes, spleen, thymus, tumor, and stool. Additional tissue can be added to the protocol upon request. **Regarding blood samples, it is now possible for interested HI3 investigators to obtain fresh blood samples from a group of selected healthy donors**. If interested in using this COMIRB protocol for your human studies and/or getting healthy blood samples, please contact: Roberta.Pelanda@cuanschutz.edu
- PHISM welcomes Matthew Lewis, a senior PRA, who came to us in early December from Portland, Oregon. Matthew is an expert in flow cytometry and already a large contributor to our studies. Jeremy Shulman and Natalie Navarro continue to manage our humanized mouse colony and are adept at running tumor studies.
- To learn more about human immune system (HIS) mouse models and the services offered through PHISM contact: Julie.Lang@cuanschutz.edu or Roberta.Pelanda@cuanschutz.edu

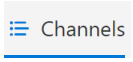
HI3 Translational Immunology Seminar Series

Mission: To extend our understanding of translational immunology and assist in clinical problem solving

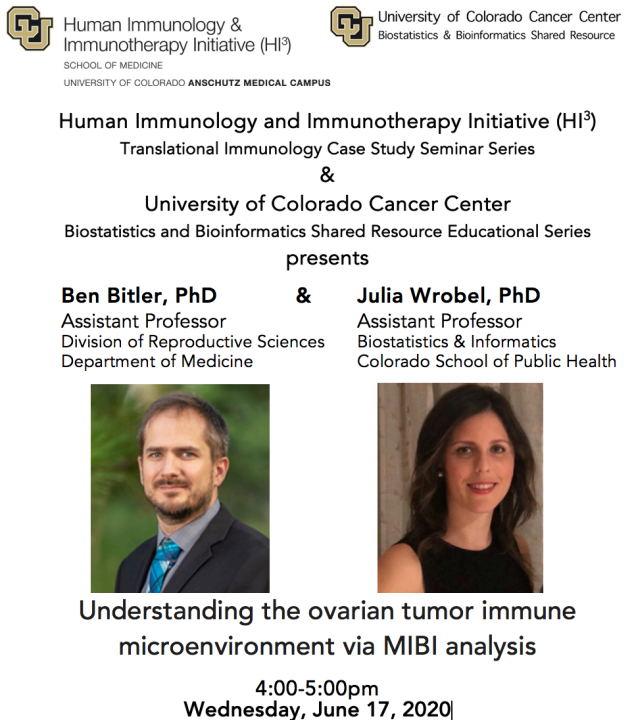
- The HI3 Translational Immunology seminar series is designed to connect investigators across campus who perform research within immunology and/or treat patients with immune-mediated disorders to learn from one another and extend our understanding of human translational immunology
- If you missed the June 17 Zoom seminar, 'Understanding the ovarian tumor immune microenvironment via MIBI analysis,' presented by Ben Bitler, PhD and Julia Wrobel, PhD along with Kim Jordan, PhD, Christian Rickert, PhD and Elena Hsieh, MD, you can watch it on the Office 365 HI3 channel
- INSTRUCTIONS: In Office 365 in the upper left corner, click on the Applications icon

- Click on the Video icon

- Click on Channels

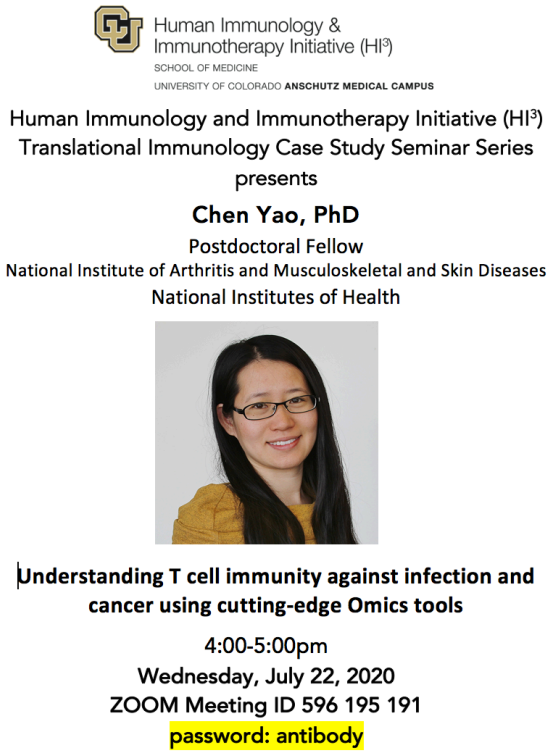


- Select the HI3 folder
- Select the video of interest



QUESTIONS? Contact Aimee.Bernard@cuanschutz.edu

MARK YOUR CALENDARS for July 22 for a seminar presented by Chen Yao, PhD



- Please join the HI3 seminar on July 22 at 4:00pm on Zoom (details on photo to the left) for 'Understanding T cell immunity against infection and cancer using cutting-edge Omics tools,' presented by Chen Yao, PhD

Using the MIBI - It takes a village!

Please view the graphic below to learn more about all of the people here on the CU AMC dedicated to helping you with the MIBI. Questions? Contact Kimberly.Jordan@cuanschutz.edu or Elena.Hsieh@cuanschutz.edu