HEALTH AI & DATA SCIENCE IN CARDIOVASCULAR AND PULMONARY DISEASE: APPLICATION & BIOETHICS (HARP-BIO)

Colorado PRIDE Academy:

Health AI and Data Science in Cardiovascular and Pulmonary Disease: Application and Bioethics

Program Overview

The Colorado **PRIDE** program: Health AI and Data Science in Cardiovascular and Pulmonary Disease: Application and Bioethics (HARP-BIO) **connects scholars with top faculty mentors and resources at the highly-ranked Division of Pulmonary Sciences and Critical Care Medicine, the Center for Bioethics and Humanities, and the Department of Biomedical Informatics at the University of Colorado Anschutz Medical Campus. Scholars will use multiple omics platforms and learn the ethical use of data sciences, machine learning, and artificial intelligence to address how coding biases impact scientific results and contribute to health disparities in cardiovascular and pulmonary diseases. Career development activities will be held monthly.**

Program Description

HARP-BIO will integrate comprehensive formal instruction on:

- **Multiple omics platforms:** (proteomics, populomics, genomics, transcriptomics and metabolomics) and bioinformatics, with an emphasis on ethical use of data sciences, machine learning, and artificial intelligence.
- **Bias in/bias out:** how coded bias affects AI and machine learning in the output of cardiovascular and pulmonary disease data and increases health disparities.
- **Career development** tools including grant writing focusing on drafting a specific aims page using rhetorical patterns of writing, how to negotiate, how to mentor/be mentored and other tools for junior faculty.
- **An additional level of engagement** distinct from the mentor-mentee relationship. With the recognition that minority scientists experience isolation and implicit bias, a sense of "otherness" that few mentors have experienced, we will implement 2 levels of academic advisement, the traditional mentor-mentee, followed by an academic coach who complements and enhances the mentors' role. Culturally competent coaches will help scholars navigate the intricacies of academia, using group activities such as communities of practice and cultural capital.
- **Best practices** in mentoring and training in cultural competence and implicit bias to mentors so they can understand the challenges under-represented scholars face.

HARP-BIO Leadership

Sonia C. Flores, PhD
Professor and Vice Chair for Diversity and Justice, Department of Medicine
Principal Investigator

Ivana V. Yang, PhD
Professor of Biomedical Informatics, Medicine, and Epidemiology; Vice Chair for Faculty Equity and Advancement, Department of Biomedical Informatics
Principal Investigator

Matthew DeCamp, MD, PhD
Associate Professor, Center for Bioethics and Humanities, Department of Medicine
Principal Investigator

Colleen Julian, PhD
Associate Professor, Department of Biomedical Informatics
Curriculum Director

Jill Penafiel
Program Manager

HARP-BIO Mentors

Faculty members from the Division of Pulmonary Sciences and Critical Care Medicine, the Center for Bioethics and Humanities, and the Department of Biomedical Informatics are available to mentor scholars.

Contact Us

HARPBIO@cuanschutz.edu
or call program manager
Jill Penafiel
303.725.2470

HARP-BIO Fellow Training

- 2 consecutive summer academies in Colorado
  - Summer Institute 1: Mid-August; two weeks; one week in-person, one remote
  - Summer Institute 2: Mid-August; one week in-person
- June 3-day meeting in Aspen, CO at the annual Aspen Lung Conference
- Annual meeting in Washington, DC
- All expenses paid
- Apply for pilot money to generate preliminary data to expand your funding portfolio
- Year-round mentoring and coaching to address issues like bias and harassment and other topics not usually discussed with mentors.

Eligibility

- Hold a doctoral degree, such as a PhD, MD, DO, DVM
- Be a research-oriented junior level faculty or be a *transitioning* post-doctoral trainee
  - *Transitioning* means that you have or will have a formal faculty appointment by the time the first Summer Institute Program convenes in August
- Be from an under-represented group (Latinx, African American, Native Americans or Pacific Islanders, LGBTQ, individuals with disabilities, economically or educationally disadvantaged backgrounds)
- Have research interests on the role of gender and ancestry of lung and/or cardiovascular diseases

About PRIDE

The **P**rograms to **I**ncrease **D**iversity Among Individuals **E**ngaged in Health-Related Research (PRIDE), initiative of the National Heart, Lung and Blood Institute (NHLBI), aims to broaden the demographic profile of biomedical research by training junior faculty from under-represented backgrounds and/or with disadvantages or disabilities, to advance their scientific careers and be more competitive for external research funding. Visit https://pridecc.wustl.edu/about to learn more about PRIDE.

How to Apply
https://pridecc.wustl.edu/apply

Summer Academy

- Sonia Flores, Ph.D.
- Ivana Yang, Ph.D.
- Matthew DeCamp, M.D., Ph.D.
- Colleen Julian, Ph.D.
- Christopher Gignoux Ph.D. Professor
- Nicholas Dwork, Ph.D. Assistant Professor
- Jennifer Kemp Ph.D. Associate Professor
- Ethan Lange Ph.D., Professor
- Leslie Lange Ph.D. Professor
- Bruce Mandt Ph.D. Director of Post-doctoral Office
- Randi Johnson, Ph.D, MPH, Assistant Professor
- Tzu Phang Ph.D. Professor
- Nicole Reisdorph Ph.D. Professor
- Richard Reisdorph, Associate Professor - Research
- Iain Konigsberg, Ph.D., Instructor
- Katrina Claw, Ph.D., Assistant Professor, former PRIDE scholar

Selected Publications

DeCamp M, Lindvall C. Latent bias and the implementation of artificial intelligence in medicine. J Am Med Inform Assoc. 2020 Dec 9;27(12):2020-2023. doi: 10.1093/jamia/ocaa094.

DeCamp M, Lindvall C. Mitigating bias in AI at the point of care. Science. 2023 Jul 14;381(6654):150-152. doi: 10.1126/science.adh2713. Epub 2023 Jul 13. PMID: 37440631; PMCID: PMC10680368..

Borie R, Cardwell J, **Konigsberg IR**, Schwartz DA, **Yang IV.** Colocalization of Gene Expression and DNA Methylation with Genetic Risk Variants Supports Functional Roles of MUC5B and DSP in Idiopathic Pulmonary Fibrosis. Am J Respir Crit Care Med. 2022;206:1259-1270. PMID: 35816432

Konigsberg IR, Lin NW, Liao SY, Liu C, MacPhail K, Mroz MM, Davidson E, Restrepo CI, Sharma S, Li L, Maier LA, **Yang IV**. Multi-Omic Signatures of Sarcoidosis and Progression in Bronchoalveolar Lavage Cells. bioRxiv. 2023:2023.01.26.525601. doi: 10.1101/2023.01.26.525601 PMID: 36747844

Heath-Freudenthal A, Toledo-Jaldin L…,…**Julian CG**. Vascular Disorders of Pregnancy Increase Susceptibility to Neonatal Pulmonary Hypertension in High-Altitude Populations. Hypertension. 2022 Apr 19: PMID: 35437031.

O'Brien KA, Gu W….Murray AJ, **Julian CG.** Genomic signals in Andean Highlanders reveal adaptive placental metabolic phenotypes that are disrupted in preeclampsia. Hypertension. 2023 Nov 29. PMID: 38018457

HARP-BIO Funding