Annual Meeting Report

2022 NHGRI Research Training and Career Development
"Optimizing Scientific Communications"
April 3–5, 2022

The NHGRI Research Training and Career Development 7th Annual Meeting was held on April 3–5, 2022. To accommodate the ongoing COVID pandemic and maximize participation, the meeting was convened as a hybrid event. The meeting was coordinated by Duke University and held at the JB Duke Hotel on the campus of Duke University. Virtual attendees participated via the Attendee Hub, a platform of Cvent (a software company for event management), which allowed virtual attendees to join sessions through a password-protected Attendee Website or the Attendee App (available on both Apple and Android devices). Virtual attendees could submit questions through the website to the speakers or panelists; the Q&A was monitored by the session moderators. All plenary sessions were recorded and available to meeting registrants here.

Each year this Annual Meeting provides a venue for all trainees supported by NHGRI across the U.S. in the fields of genome sciences, genomic medicine, and the ethical, legal and social implications (ELSI) to present their research and network with other trainees and established researchers. The meeting includes science and career development topics, invited keynote presentations, panel discussions, peer-reviewed platform and poster presentations, breakout sessions, and networking opportunities.

All members of NHGRI training programs were invited to attend, along with program directors, program coordinators, NHGRI staff, NHGRI program advisors, and invited speaker, panelists and moderators. NHGRI trainees are supported through Diversity Action Plan (DAP) Programs, Institutional pre- and post-doctoral Training (T32) programs, pre- and post-doctoral Individual Fellowships (F30, F31, and F32), Career Development (K) Awards, and Centers of Excellence in ELSI Research (CEER). From a total of 383 meeting registrants, there were 73 DAP Trainees, 17 T32 Trainees, 14 Fellowship Awardees, 22 Career Development (K) Awardees, 9 Training Program Staff, 31 Program Directors, 4 Diversity Supplement Awardees, 9 Invited Panelists, 3 Keynote speakers, 16 NHGRI staff, 22 Program Coordinators, 4 Trainee/Students (not specified), 5 NHGRI RTEP advisors, and 9 Other/Unknown. Of a total of 383 meeting registrants, 226 registered to attend in-person and 157 registered to attend virtually.

All registered trainees were invited to submit abstracts. Of the 291 trainees who registered for the meeting, 213 submitted abstracts. Submitters were asked to indicate their preference for consideration in a platform, lightning or poster session only presentation. All abstracts were evaluated by the NHGRI training team, with input from the training program directors and coordinators. Abstracts were selected for ten-minute Platform Scientific Talks or one-minute Lightning Talks, and all other abstracts were presented as Poster Presentations. Trainees were invited to serve as session moderators. Six trainees were selected for a platform presentation and 30 for a lightning talk. To enable all attendees to view a trainee's poster and/or hear their poster talk, we asked that all abstract submitters also submit a pdf file of their poster and a short, pre-recorded video poster talk. The pdf poster file and pre-recorded poster talk were uploaded and accessible to all attendees through the meeting attendee site.

A quick feedback survey was available following each session through the attendee website and app. A longer, post-meeting survey was also administered.

DAY ONE (Virtual Attendance: 41)

Welcome and Opening Remarks: Dr. Susanne Haga, Duke University
Dr. Susanne Haga, Associate Professor in Medicine, Duke University welcomed everyone

Keynote Speaker: Dr. **Robert Lefkowitz**, James B. Duke Distinguished Professor of Medicine, Professor of Biochemistry, Pathology and Chemistry, Duke University. Introduced by **Dr. Svati Shah, Professor of Medicine, Duke University.**
Talk title: "**A Tale of Two Callings"**
Dr. Lefkowitz is a renowned physician scientist who has been a Howard Hughes Investigator since 1976. Over half of the drugs used today are based on the target receptors discovered in his lab. His transformational work has led to many awards including the Nobel Prize in Chemistry in 2012.
During this session, Dr. Lefkowitz presented an overview of his scientific career and research. He also shared what he considers to be keys to success in science. A few are listed below:

- Focus
- Build your career around scientific problems that interest you
- Do lots of experiments
- Don't talk yourself out of experiments too easily
- Learn to tell a good story

His memoir, *A Funny Thing Happened on the Way to Stockholm*, recounts his early career as a cardiologist and his transition to biochemistry, which led to his Nobel Prize win.
Following his presentation was a Q&A session.

CAREER TALK: Dr. Raphael Valdivia, Professor of Molecular Genetics and Microbiology, Duke University. Introduced by **Dr. Svati Shah.**
Talk title: "**How to Become Your Own Best Advocate: Lessons I learned from the Academic World"**
Dr. Valdivia's lab is interested in how microbes influence disease and health. One arm of his research focuses on Chlamydia infections and identifying and characterizing the bacterial factors that are secreted across the membrane bound compartment in which Chlamydia resides. He is the founding Director of the Duke Center for the Genomics of Microbial Systems and served as the Vice Dean for Basic Science in the School of Medicine at Duke University.
During this session, Dr. Valdivia presented his personal history as a child and how his parents instilled the importance of education. He began his academic studies at Cornell University in 1987 – 1991 and shared the importance of mentors and how specific mentors encouraged him to study science. In 1992, he was accepted at Stanford University School of Medicine for his PhD in Microbiology and Immunology. He shared these important career tips:

- Advocate for yourself
- Recognize the best time to negotiate
- Prepare by gathering information
- Make the value of your ideas clear
- Navigate: keep an open mind

A Q&A session followed with questions from in-person and virtual attendees.

DAY TWO

[Morning Session] (Virtual Attendance: 68)

WELCOME & MEETING ANNOUNCEMENTS: **Vence Bohnam, Jr., J.D.**

[Introduced by **Heather Colley,** Program Director, Division of Genomic Medicine, NHGRI]

Mr. Bonham is the Acting Deputy Director for NHGRI and an associate investigator in NHGRI's Social and Behavioral Research Branch. Mr. Bonham provides leadership for the institute's health equity and workforce diversity programs and works in partnership across NIH to promote the mission of the institute. His research focuses primarily on the social implications of new genomic knowledge, particularly in communities of color. He studies how genomics influences the use of the constructs of race and ethnicity in biomedical research and clinical care, and the role of genomics in exacerbating or ameliorating health inequities.

During this session, Mr. Bonham welcomed meeting attendees. In way of meeting announcements, he gave an overview of the new office of Training Diversity and Health Equity Office (TiDHE) and its mission to coordinate, develop and support NHGRI training programs for genomics careers; develop and support initiatives to enhance genomic workforce diversity and genomic health equity and to provide strategic programmatic leadership for training, diversity and health equity at NHGRI. In January 2021, NHGRI released a new action agenda called "Building a Diverse Genomics Workforce: An NHGRI Action Agenda". Details of this agenda can be seen at genome.gov/workforce diversity.

Following Mr. Bonham's presentation was a brief period of Q&A from in-person and virtual attendees.

TRAINING OPPORTUNITIES AT NIH**: Dr. Belen Hurle,** Training Program Coordinator, Intramural Training Office, NHGRI. [Introduced by Vence Bonham]

Dr. Hurle discussed the Office of Intramural Training & Education (OITE) which offers career development support for postdoctoral and summer program trainees at NHGRI since 2007. The summer internship program is offered to ages 17 years and up and is an 8-10 week summer laboratory experience. There are also many other subprograms offered at NIH. Various training programs OITE offers can be found at www.training.nih.gov.

TRAINEE PLATFORM PRESENTATIONS

Six trainees presented 12-minute talks at this session. The session moderators were **Dan Ciotlos** of University of Michigan and **Audrey Ynigez-Gutierrez** of University of Wisconsin-Madison (Dr Haga served in Mr Ciotlos' absence). The following trainees presented:

- **Kayte Spector-Bagdady**, University of Michigan, *"One of the most horrific experiences known to man": Factors considered by academic genetic researchers when choosing a dataset"*
- **Dana Ernst**, University of Utah, *"Reproductive Concerns of Disabled Women: Whose Definitions of Disability are We Embracing?"*
- **Gabriela Degro**, Washington University of St. Louis Medical School, *"Co-inhibition of PARP and GAS6 reduces tumor burden in Ovarian Cancer"*
- **Yasha Ektefaie**, Harvard Medical School, *"Mutational Data Split for Machine Learning Models that Predict Genotype From Phenotype"*
- **Evonne McArthur**, Vanderbilt University, *" Chromatin folding shaped the divergence between modern humans and Neanderthals"*
- **Molly Martorella**, Columbia University, *"Optimization of low cost, noninvasive RNA-sequencing to enable massive scaling of transcriptome studies"*

KEYNOTE TALK:
Keynote Speaker: Ms. Apoorva Mandavilli, MA, MS, The New York Times
Talk title: "**Optimizing Scientific Communication in the Era of Misinformation & Fear"**

[Introduced by Dr. **Lucia Hindorff,** Lead Extramural Training Program Director, Training, Diversity, and Health Equity Office, NHGRI]

Ms. Apoorva Mandavilli is a reporter for The New York Times focusing on science and global health. She currently covers the Coronavirus pandemic, vaccinations, W.H.O, CDC and FDA. She is the winner of the Victor Cohen Prize for excellence in medical science reporting.

During her Keynote presentation, Ms. Mandavilli presented her career as a reporter, early writing and on the current fast-moving pandemic. Her writing on the virus focuses on the emerging information (or lack thereof) while attempting to report accurate news.

There were very interesting questions from the in-person attendees as well as a few from virtual attendees.

TRAINEE LIGHTNING TALKS #1 (Virtual Attendance: 48)

Eight trainees presented Lightning Talks which were a brief one-minute, one-slide presentations intended to quickly engage the audience's attention and interest them in visiting the trainee's poster presentation. Each Lightning Talk presenter also presented a poster during the poster session. The Day Two Lightning Talk session moderators were **Zeinab Haratipour** of Vanderbilt University Medical Center and **Katherine Collins** of Duke University. The following trainees presented:

- **Hadley Smith**, Baylor College of Medicine, *"Family-Level Utility of Pediatric Genomic Sequencing: A Qualitative Analysis and Attribute Framework"*
- **Drew Blasco**, University of Michigan, *"Uptake and interest in genetic testing among a nationally representative sample of middle-to-older aged U.S. adults"*
- **Chun-Kan Chen**, Stanford University
- *"Structured elements drive extensive circular RNA translation"*
- **Danielle Gutman**, University of Pennsylvania, *"Mapping functional uORFs in the human genome"*
- **Kara Quaid**, Washington University in St. Louis, *"Harnessing iPSCs to Define Interaction between Genetic and Epigenetic Variation"*
- **Gracie Gordon**, University of California, San Francisco, *Single cell rna-sequencing of 1.2 million cells reveals cellular and genetic correlates of systemic lupus erythematosus"*
- **Namita Khajanchi,** University of Wisconsin – Madison, *"Chromatin modulation improves CRISPR gene editing in human pluripotent stem cells"*
- **Meghan Halley**, Stanford University, *"Post-trial obligations in clinical genomics research with undiagnosed patients"*

[Networking Plated Lunch]

[Afternoon Session] (For the afternoon, two concurrent Career Development Sessions were convened. All attendees could attend any of the two sessions offered in its entirety or choose another session to move to)

CONCURRENT CAREER DEVELOPMENT SESSIONS #1

- **Session 1A: It takes Two (at least): Establishing a Productive Mentor-Mentee Relationship (Virtual Attendance: 46)**

  Panelists: Dr. Anne West, a Professor of Neurobiology at Duke University who's lab is to understand at a cellular/molecular level how activity regulates the formation and maturation of synapses during brain development; Steven Joffe, a pediatric oncologist and bioethicist at University of Pennsylvania and the director of the Penn Fellowship in Advanced Biomedical Ethics and the Penn Postdoctoral Training Program in ELSI of Genetics and Genomics; Katharine Callahan, Fellow in ELSI and Neonatology Fellow, Children's Hospital of Philadelphia and Mike

Thompson, Graduate Student of UCLA. This session provided advised on how to have productive mentor-mentee relationships and the value these relationships can have.

- **Session 1B: Negotiation and Faculty Positions (Virtual Attendance: 17)**
  Panelists: **Julie Johnson,** Dean of the College of Pharmacy and Distinguished Professor at the University of Florida and **Joseph Yost,** the Vice Chairman for Basic Science Research and Professor in the Department of Pediatrics and the University of Utah. The moderators led trainees through the complexities of grant application, with many useful tips and insights.

CONCURRENT CAREER DEVELOPMENT SESSIONS #2

- **Session 2C: Genomics Careers – What's out there? (Virtual Attendance: 25)**
  Panelists: **Heidi Rehm,** Co-director of the Program in Medical and Population Genetics and an institute member at the Broad Institute; **Kathleen Cooney,** Chair of the Duke Department of Medicine and Interim Director of the Duke Center for Applied Genomics and Precision Medicine; **Ben Scruggs,** Associate at Hatteras Venture Partners and director on the boards of IMMvention Threpeutix and Veralox Therapeutics and **Jennifer Israel,** Associate Director of Genomics, Kriya Therapeutics.

- **Session 2D: Science Writing for the Public (Virtual Attendance: 29)**
  Panelists: **Susanne Haga**, Associate Professor in Medicine and **Chris Gunter,** Senior Advisor to the Director for Genomics Engagement at NHGRI

- **Closed Session for Training Coordinators [accessible via meeting invite]**
  Gisselle Velez-Ruiz, Associate Director, Diversity, Education, and Outreach (Broad Institute DAP) and **Bruce Korf**, Associate Dean for Genomic Medicine (University of Alabama at Birmingham DAP/T32).

TRAINEE LIGHTNING TALKS #2 (Virtual Attendance: 38)

Ten trainees presented Lightning Talks, one-minute, one-slide presentations intended to quickly engage the audience's attention and interest them in visiting the trainee's poster presentation. Each Lightning Talk presenter also presented a poster during the poster session. The Day Two Lightning Talk session moderators were **Lia Serrano** of University of Wisconsin-Madison and **Sarah Heston** of Duke University. The following trainees presented:

- **Madison Kilbride**, University of Utah, *"Uptake and patient-reported outcomes with web-based pre-disclosure education for return of cancer genetic research results"*
- **Lev Litichevskiy**, University of Pennsylvania, *"Aging disrupts circadian gene regulation and function in macrophages"*
- **Megan Lancaster**, Vanderbilt University Medical Center, *"Rare variant carriers with Long QT Syndrome Type 5 found by identity-by-descent based clustering"*
- **Lynette Hammond Gerido**, University of Michigan, *"Connected Families: Opportunities to Innovate the Collection and Use of Family Health History"*
- **Tavis Reed**, Princeton University, *"Thermal proximity coaggregation mass spectrometry reveals shared and distinct rewiring of interactomes in alpha, beta, and gamma herpesvirus infection"*
- **Cecily Gibson**, Baylor College of Medicine, *"Validation of Gene Knockout and Knockdown Model with IRD Candidate Gene SPATA7"*
- **Rachel Mester**, University of California, Los Angeles, *"How Does Effect Size Heterogeneity Influence Disease Mapping in Admixed Populations?"*
- **Gabrielle Dotson**, University of Michigan, *"Spatial analysis reveals a diverging relationship between innate and adaptive adipose tissue immune cells in obesity"*

- **Abena BakenRa**, University of Utah, *"Exploratory Content Analysis of Prenatal Genetic Testing of Twitter Users"*
- **Paul Robbins**, Duke University, *"Parental involvement in the NCAA's screening of emerging adults for sickle cell trait"*

POSTER SESSION #1 (Odd-Numbered Posters)

Attendees were invited to view the posters set up outside of the conference room and in the hallways of the downstairs meeting areas. Posters and poster talks of virtual attendees were accessible through the meeting attendee site.

ELSI VIRTUAL NETWORKING CAFÉ
Networking is an important component of the Annual Meeting. This session was convened for trainees in ELSI research and attended by eight participants (virtually). The session was led by Dr **Joy Boyer (NHGRI)**. During this session, ELSI trainees and the leader exchanged ideas and discussed their progress in the program.

DAY THREE

GREETINGS AND MEETING ANNOUNCEMENTS: **Dr. Lucia Hindorff,** Lead Extramural Training Program Director, Training, Diversity, and Health Equity Office, NHGRI

TRAINEE LIGHTNING TALKS #3 (Virtual Attendance: 32)
Nine different trainees presented Lightning Talks, brief one-minute, one-slide presentations intended to quickly engage the audience's attention and interest them in visiting the trainee's poster presentation. Each Lightning Talk presenter also presented a poster during the poster session. The Day Two Lightning Talk session moderators were **Meena Chakraborty** of Stanford University and **Katherine Hendy** of University of Michigan. The following trainees presented:

- **Stephanie Kraft**, Seattle Children's Research Institute, *"Development of a Novel Educational Intervention to Improve Respect and Equity in Research Recruitment: Objectives of the Better Recruitment Interactions for Every Family (BRIEF) Team Training Module"*
- **Erin Ostrem Loss**, University of Wisconsin-Madison, *"Fiber Complexity Shapes the Dynamics and Response of Synthetic Human Gut Communities to Perturbations"*
- **Amanda Jackson**, Baylor College of Medicine, *"Using Data Visualization to Guide Large-Scale Comparative Genomics" [due to technical difficulties, she was unable to present]*
- **Sheethal Jose**, Johns Hopkins University, *"Health professionals' perspectives on the ethics of using COVID-19 host genomic information for clinical and public health decision-making during the pandemic"*
- **Katharine Press Callahan**, Children's Hospital of Philadelphia, University of Pennsylvania, *"Health professionals' perspectives on the ethics of using COVID-19 host genomic information for clinical and public health decision-making during the pandemic"*
- **Dan Ju**, University of Pennsylvania, *"Investigating the genetic architecture of height in Central African Rainforest Hunter-gatherer"*
- **Raeline Valbuena**, Stanford University, *"Deciphering the complex regulatory network of heterochromatic repression"*
- **Vijay Ganesh**, Brigham and Women's Hospital, *"Haploinsufficiency of CHASERR, a human long non-coding RNA, implicates dosage sensitivity of CHD2 in brain development"*
- **Xiao Fan**, Columbia University, *"Characteristics of Pathogenicity for In-frame Insertion and Deletion Variants"*

POSTER SESSION 2 (Even-numbered posters)
Attendees were invited to view the posters set up outside of the conference room and in the hallways of the downstairs meeting areas. Posters and poster talks of virtual attendees were accessible through the meeting attendee site.

CONCURRENT CAREER DEVELOPMENT SESSIONS #2
After Poster Session #2, the meeting was divided into three Concurrent Career Development. Attendees could attend any session.

- **Session 3F: Overview of the NIH Grant Process (Virtual Attendance: 14)**
  Panelists: **Dr. Lisa Chadwick**, Program Director of Genome Sciences, NHGRI; **Dr. Tim Reddy**, Duke University

- **Session 3G: Start-Ups and Working Industry (Virtual Attendance: 14)**
  Panelists: **Dr. Michael Snyder,** Stanford W. Ascherman Professor of Genetics at Stanford University, **Dr. Charles Gersbach,** Rooney Family Associate Professor of Biomedical Engineering at Duke University and **Dr. Ornit Chiba-Falek**, Professor of Neurology at Duke University.

- **Session 3H: Interviewing Techniques (And Perfecting Your Elevator Speech) (Virtual Attendance: 11)**
  Panelists: **Dr. Debra Murray,** Assistant Professor at Baylor College of Medicine and **Dr. Steve Reilly**, Assistant Professor of Genetics at Yale University.

- **CLOSED EXECUTIVE SESSION FOR PROGRAM PIs & COORDINATORS, NHGRI STAFF AND ADVISORS**
  Dr. Heather Colley led the discussion for this closed session.

CLOSING REMARKS (Ballroom) (Virtual attendance: 29)
Dr. Shujo Sen, Program Director of the Division of Genome Sciences, NHGRI, delivered the final remarks of the meeting by thanking everyone for participating in the annual meeting and hoped to meet everyone in person next year.

CLOSED EXECUTIVE SESSION WITH NHGRI AND ADVISORS

AGENDA
2022 NHGRI Research Training and Career Development Annual Meeting – "Optimizing Scientific Communications"
April 3-5, 2022

The JB Duke Hotel, Durham, NC 27708

Day 1: Sunday, April 3

Time	Session	Room Location
1:30	**Poster Setup & Meeting Registration**	Entry Plaza
3:00	**WELCOME** ***Susanne Haga, PhD, Duke University***	Ballroom
3:15	**KEYNOTE** **Title: A tale of two Callings** **Speaker: Robert Lefkowitz, MD** Duke University **Q & A**	Ballroom
4:00	**CAREER TALK** **Title: How to Become Your Own Best Advocate – Lessons I learned from the Academic World** Speaker: Raphael Valdivia, PhD Duke University **Q & A**	Ballroom
4:45	**Opening Reception [IN-PERSON ONLY]**	Marketplace
6:00	**Dinner Available [IN-PERSON ONLY]**	Marketplace

Day 2: Monday, April 4

Time	Session	Room Location
6:30	**Buffet Breakfast [IN-PERSON ONLY]**	Marketplace
8:00	**Poster Setup [IN-PERSON ONLY]**	Entry Plaza
9:00	**Welcome & Meeting Announcements** *Vence Bonham Jr., J.D., NHGRI*	Ballroom
9:15	**Training Opportunities at NIH** *Speaker: Belen Hurle, PhD, NHGRI*	Ballroom
9:35	**TRAINEE PLATFORM PRESENTATIONS** **Moderators:** Dan Ciotlos, University of Michigan/ Audrey Ynigez-Gutierrez, University of Wisconsin-Madison *(Note:12 min. each)* *Kayte Spector-Bagdady, University of Michigan*	Ballroom

Dana Ernst, University of Utah
Gabriela Degro, Washington University of St. Louis Medical School
Yasha Ektefaie, Harvard Medical School
Evonne McArthur, Vanderbilt University
Molly Martorella, Columbia University

10:50 **BREAK**

11:05 **KEYNOTE TALK – Optimizing Scientific Communication in the Era of Misinformation & Fear** Ballroom
Speaker: Apoorva Mandavilli, MA, MS
The New York Times

11:50 **TRAINEE LIGHTNING TALKS** Ballroom
Moderators: Zeinab Haratipour, Vanderbilt University Medical Center
Katherine Collins, Duke University
(Note: 1 min.each)
Hadley Smith, Baylor College of Medicine
Drew Blasco, University of Michigan
Chun-Kan Chen, Stanford University
Danielle Gutman, University of Pennsylvania
Samuel Regalado, University of Washington
Kara Quaid, Washington University in St Louis
Gracie Gordon, University of California, San Francisco
Namita Khajanchi, University of Wisconsin-Madison
Meghan Halley, Stanford University

12:10 **Networking Plated Lunch [IN-PERSON ONLY] (sign-up for faculty mentor table)** Marketplace

1:45 **CONCURRENT SESSIONS #1**
Session A: It Takes Two (at least): Establishing a Productive Mentor-Mentee Relationships Ballroom

Panelists: Anne West (Duke); Steven Joffe (UPenn); Katharine P Callahan (Post-doc, UPenn), Mike Thompson (Grad Student, UCLA)

Session B: Negotiation and Faculty Positions
Glaxo Classroom

Panelists: Julie Johnson (University of Florida)
Joseph Yost (University of Utah)

2:50 **Group Photograph + Break [IN-PERSON ONLY]**

3:15 **CONCURRENT SESSIONS #2**

Session C: Genomics Careers – What's out there?
Ballroom

Moderator: Greg Wray, PhD (Duke)
Panelists: Heidi Rehm, PhD (MGH/Broad Institute Clinical Research Sequencing Platform);
Kathy Cooney, MD (Duke);
Ben Scruggs, PhD (Venture Capital - Investor)
Jennifer Israel, PhD (Kriya Therapeutics)

Session D: Science Writing for the Public
Executive Classroom

Panelists: Susanne Haga (Duke),
Chris Gunter (NHGRI - Virtual)

Session for Training Coordinators
Glaxo Classroom

(Closed Session – Zoom link to be sent)

4:20 **TRAINEE LIGHTNING TALKS** Ballroom

Moderators: Lia Serrano, University of Wisconsin-Madison/ Sarah Heston, Duke University
(Note: 1 min. each)
Madison Kilbride, University of Utah
Lev Litichevskiy, University of Pennsylvania
Megan Lancaster, Vanderbilt University Medical Center
LH Gerido, University of Michigan
Tavis Reed, Princeton University
Cecily Gibson, Baylor College of Medicine
Rachel Mester. University of California, Los Angeles
Gabrielle Dotson, University of Michigan
Abena BakenRa, University of Utah
Paul Robbins, Duke University

4:35 **Poster Session 1**: Odd Numbered Posters Entry Plaza
[IN-PERSON ONLY]

5:35 **Networking Happy Hour & Dinner (ON YOUR OWN) [IN-PERSON ONLY]**

7:00 **Virtual Networking Café --**
Ethical, Legal, & Social Issues

Day 3: Tuesday, April 5

Time	Session		Room Location
6:30		**Buffet Breakfast [IN-PERSON ONLY]**	Marketplace
9:00		**Greetings & Meeting Announcements** ***Speaker:*** *Lucia Hindorff (NHGRI)*	Ballroom
9:10		**TRAINEE LIGHTNING TALKS** **Moderators:** Meena Chakraborty, Stanford University Katherine Hendy, University of Michigan [Note: 9 speakers, 1 min. each] *Stephanie Kraft, Seattle Children's Research Institute* *Erin Ostrem Loss, University of Wisconsin-Madison* *Amanda Jackson, Baylor* *Sheethal Jose, Johns Hopkins University* *Katharine Press Callahan, University of Pennsylvania* *Dan Ju, University of Pennsylvania* *Raeline Valbuena, Stanford University* *Vijay Ganesh, Brigham and Women's Hospital* *Xiao Fan, Columbia University*	Ballroom
9:30		**Poster Session #2: Even Numbered Posters** **[IN-PERSON ONLY]**	Entry Plaza
10:30		**BREAK**	
10:45		**CONCURRENT SESSIONS #3**	
		Session F: Overview of the NIH Grant Process **Panelist: Lisa Chadwick (NHGRI)**	Executive Classroom
		Session G: Start-Ups and Working in Industry ***Panelists: Michael Snyder (Stanford);*** ***Charlie Gersbach (Duke), Ornit Chiba-Falek (Duke)***	Glaxo Classroom
		Session H: Interviewing Techniques – via Zoom or In-Person (And Perfecting Your Elevator Speech) ***Panelists: Debra Murray (Baylor), Steve Reilly (Yale)***	Meeting Room B
		Executive Session for Program PIs & Coordinators, NHGRI staff and Advisors (Closed – Zoom link to be sent)	Meeting Room C

11:45	**CLOSING REMARKS** ***Speakers: Shurjo Sen, Ph.D.*** *Program Director, Division of Genome Sciences, NHGRI*	Ballroom
12:00	**Networking Lunch [IN-PERSON ONLY]**	Marketplace
1:00	**Closed Executive Session with NHGRI and Advisors**	Meeting Room C

SPEAKERS & PANELISTS BIOS

Robert Lefkowitz
James B. Duke Professor of Medicine, Professor of Biochemistry and Chemistry, Duke University

He has been an Investigator of the Howard Hughes Medical Institute since 1976. Lefkowitz was born on April 15, 1943, in The Bronx, New York.After graduating from the Bronx High School of Science in 1959, he attended Columbia College from which he received a bachelor of arts in chemistry in 1962.He graduated from Columbia University College of Physicians and Surgeons in 1966 with an M.D. Degree. After serving an internship and one year of general medical residency at Columbia Presbyterian Medical Center, he served as Clinical and Research Associate at the National Institutes of Health as a Commissioned Officer in the United States Public Health Service from 1968 to 1970. Upon completing his medical residency and cardiology fellowship in 1973 at the Massachusetts General Hospital in Boston he joined the faculty at Duke. Lefkowitz studies receptor biology and signal transduction and is most well-known for his detailed characterizations of the sequence, structure and function of the β-adrenergic and related receptors and for the discovery and characterization of the two families of proteins which regulate them, the G protein-coupled receptor (GPCR) kinases and β-arrestins.Today, as many as 30 percent of all prescription drugs are designed to “fit” like keys into the similarly structured locks of Lefkowitz’ receptors-everything from anti-histamines to ulcer drugs to beta blockers that help relieve hypertension,angina and coronary disease. He has been elected to both the National Academy of Sciences and National Academy of Medicine as well as the American Academy of Arts and Sciences. Amongst many awards he has received the Gairdner Foundation International Award, the American Heart Association’s Basic Research Prize and its Research Achievement Award, the Albany Medical Center Prize in Medicine, the Shaw Prize in Life Science and Medicine, the National Medal of Science and the Nobel Prize in Chemistry in 2012, a prize he shared with his former trainee Dr. Brian Kobilka.

Raphael Valdivia
Professor of Molecular Genetics and Microbiology, Duke University

My laboratory is interested in how microbes influence human health, both in the context of host-pathogen and host-commensal interactions. For many pathogens, and certainly for most commensal microbes, it is is poorly understood what is the molecular basis for how host and microbial factors contribute to a beneficial outcome for us. We currently focus on two experimental systems: *Chlamydia trachomatis* infections are responsible for the bulk of sexually transmitted bacterial diseases and are the leading cause of infectious blindness (trachoma) in the world. *Chlamydia* resides within a membrane bound compartment ("inclusion"). From this location, the pathogen manipulates the cytoskeleton, inhibits lysosomal recognition of the inclusion, activates signaling pathways, re-routes lipid transport, and prevents the onset of programmed cell death. Our laboratory focuses on identifying and characterizing the bacterial factors that are secreted into the host cell cytoplasm to manipulate eukaryotic cellular functions. We use a combination of cell biological techniques, biochemistry, genetics, genomics, live cell microscopy, proteomics and molecular biology to determining the function of virulence factors that reveal novel facets of the cell biology of host-pathogen interactions. Our ultimate goal is to understand how these obligate intracellular bacterial pathogens manipulate host cellular functions to replicate, disseminate and cause disease. A second area of focus in my research group is the development of new methods to perform genetic analysis in many of the microbes that reside in our gut. Understanding how the collection of genetic information of microbes associated with our bodies (microbiomes) impact our health is one of the new frontiers in microbiology. We are currently studying how one specific bacterium, Akkermansia muciniphila, proliferates in the mucus layers of our lower gastrointestinal tract and contribute to nutrient homeostasis and human immunological health.

Vence L. Bonham, Jr.
Acting Deputy Director, NHGRI

Vence L. Bonham, Jr. is acting deputy director of the National Human Genome Research Institute and a member of the senior leadership team for the institute. Mr. Bonham provides leadership for the institute's health equity and workforce diversity programs and works in partnership across NIH to promote the mission of the institute. He received his Bachelor of Arts from James Madison College at Michigan State University and his Juris Doctor degree from the Moritz College of Law at Ohio State University. Mr. Bonham was a fellow in the American Association of Medical Colleges Health Services Research Fellowship Program. Mr.Bonham was a tenured faculty member at Michigan State University with appointments in the Colleges of Medicine and Law. He is currently an associate investigator in the National Human Genome Research Institute (NHGRI) within the Division of Intramural Research's Social and Behavioral Research Branch. He leads the Health Disparities Unit, which investigates the equitable integration of new genomic knowledge and precision medicine into clinical settings. His research focuses primarily on the social implications of new genomic knowledge, particularly in communities of color. He studies how genomics influences the use of the constructs of race and ethnicity in biomedical research and clinical care, and the role of genomics in exacerbating or ameliorating health inequities. The Bonham group also studies sickle cell disease, a condition that will be impacted by

emerging curative genomic technologies, but has faced significant health disparities both in the United States and globally.

Belen Hurle
Training Program Coordinator, Intramural Training Office, NHGRI.

Belen Hurle, Ph.D., develops models of public engagement related to genomics, genetics and public health. Specifically, she identifies target populations and public health issues in need of education programs and develops partnerships between the NHGRI and communities of interest.Dr. Hurle joined the NHGRI in November 2002 as a Research Fellow after completing four years of postdoctoral training in Molecular Genetics at Washington University in St. Louis. Over the years, she has held numerous positions with the NHGR Division of Intramural Research and with the Office of the Director, including as a staff scientist (2008-2010), and as a science education fellow (2005 to 2007). Presently, she also serves as program coordinator for the NHGRI Intramural Training Office, offering career development support for postdoctoral and summer program trainees since 2007. Dr. Hurle holds a Ph.D. in molecular biology from the University of Oviedo (Spain). Born and raised in Spain, she has a significant track record of engagements with Latino communities to disseminate information about human genome research as it pertains to their health and lives, and a firm commitment to recruiting underrepresented populations to the genomics workforce.

Apoorva Mandavilli
Reporter, The New York Times

Apoorva Mandavilli is a reporter for The New York Times, focusing on science and global health. She currently covers the coronavirus pandemic, vaccinations, the World Health Organization, Centers for Disease Control and Prevention and the Food and Drug Administration. She is the 2019 winner of the Victor Cohn Prize for Excellence in Medical Science Reporting. She is the founding editor in chief of Spectrum, an award-winning news site on autism science that grew an audience of millions. She led the team there for 13 years. She joined The Times in May 2020, after two years as a regular contributor. Ms. Mandavilli has won numerous awards for her writing. Her work has been published in The Atlantic, Slate and The New Yorker online, and in the anthology ”Best American Science and Nature Writing.”
She co-founded Culture Dish, an organization dedicated to enhancing diversity in science journalism, and was the founding chair of the Diversity Committee for the National Association of Science Writers. Ms. Mandavilli has a Master of Arts degree in journalism from New York University and a Master of Science degree in biochemistry from the University of Wisconsin-Madison. She is fluent in English, Hindi, Tamil, Telugu and Kannada.

Anne West
Professor of Neurobiology, Duke University

The long term goal of our laboratory is to understand at a cellular/molecular level how neuronal activity regulates the formation and maturation of synapses during brain development, and ultimately to use genetic model systems to understand how defects in this developmental process lead to cognitive dysfunction.

Steve Joffe
Interim Chair, Department of Medical Ethics & Health Policy Chief, Division of Medical Ethics Founders Professor of Medical Ethics and Health Policy Professor of Pediatrics, U Penn

Steven Joffe is a pediatric oncologist and bioethicist who is currently the Founders Professor and Interim Chair of Medical Ethics and Health Policy, as well as Professor of Pediatrics, at the University of Pennsylvania Perelman School of Medicine. He is also the Director of the NHGRI-funded Penn Postdoctoral Training Program in the Ethical, Legal and Social Implications (ELSI) of Genetics and Genomics. Dr. Joffe's research addresses the many ethical challenges that arise in the conduct of clinical and translational investigation and in the practice of genomic medicine and science. He has led NIH and foundation grants to study the roles and responsibilities of principal investigators in multicenter randomized trials, accountability in the clinical research enterprise, children's capacity to engage in research decisions, return of individual genetic results to participants in epidemiologic cohort studies, the integration of whole-exome sequencing technologies into the clinical care of cancer patients, and strategies for identifying hereditary risk among young adults with cancer. He has coauthored over 200 articles addressing these topics. He serves as a member of the FDA's Pediatrics Ethics Subcommittee and the National Institutes of Health Clinical Center's Board of Scientific Counselors and chairs the National Human Genome Research Institute's Genomics and Society Working Group. Dr. Joffe attended Harvard College, received his medical degree from the University of California at San Francisco, and received his public health degree from UC Berkeley. He trained in pediatrics at UCSF and undertook fellowship training in pediatric hematology/oncology at the Dana-Farber Cancer Institute and Boston Children's Hospital.

Katherine Press Callahan
Fellow in Ethical, Legal, and Social Implications of Genetics and Genomics, University of Pennsylvania

Katharine received her MD from Johns Hopkins University School of Medicine in 2016 and completed her pediatrics residency at Columbia University in 2019. She is currently a neonatology fellow at the Children's Hospital of Philadelphia. Her research has focused on how genetics affects clinical care, from the perspective of doctors and patients. Her most recent work explored ways to enhance physician's understanding of disability and how learning about a patient's life beyond a genetic diagnosis can enhance medical care. For the next three years, Katharine will combine Neonatology and ELSI fellowships and plans to investigate the ethical and social dynamics of genetic testing in the neonatal intensive care unit.

Michael Thompson
Assistant Professor in the Department of Chemistry and Biochemistry of University of California, Los Angeles

Professor Thompson is a California native, was an undergraduate at UC Berkeley (2007), received his Ph.D. from UCLA (2014), and was a postdoctoral fellow at UCSF before being appointed to the faculty at UC Merced in 2020. He is an Assistant Professor in the Department of Chemistry and Biochemistry. Molecular motion is critical for protein function, but it remains challenging to study the structural dynamics of complex molecules in atomic detail. My goal is to develop new types of structural and biophysical experiments that transcend the limitations of traditional techniques, allowing us to map structural interconversions at high spatial and temporal resolution.

Julie Johnson
Dean & Distinguished Professor, College of Pharmacy, University of Florida

Julie A. Johnson, Pharm.D., is dean of the University of Florida College of Pharmacy and distinguished professor of Pharmacy and Medicine. She received her B.S. in Pharmacy from the Ohio State University and her Pharm.D. from the University of Texas at Austin and the UT Health Science Center at San Antonio. She completed a post-doctoral fellowship in cardiovascular pharmacology/pharmacokinetics at Ohio State. Johnson's research focuses on cardiovascular pharmacogenomics and genomic medicine implementation. She is an internationally-recognized leader in pharmacogenomics and genomic medicine, with over 300 peer reviewed publications and nearly $50 million in research funding as principal investigator. In 2015, 2016, 2017 she was named a Thomson Reuters (now Clarivate Analytics) Highly Cited Scientist in Pharmacology and Toxicology, and in 2018 in the Cross Discipline category, indicating she is in the top 1% of the most highly cited scientists in the field globally.

Joseph Yost
Richard L. Stimson Presidential Endowed Chair, Vice Chairman for Basic Science Research, Department of Pediatrics, U Utah

H. Joseph Yost, PhD, is the Richard L. Stimson Presidential Endowed Chair, and Vice Chair for Basic Science Research in Pediatrics at the University of Utah. His research team works at the intersection between human genomics and zebrafish genetics, bioinformatics and the discovery of novel disease-causing mutations in human genomes. They have generated zebrafish genetic models of human congenital heart diseases (CHD), adult onset heart-failure, ciliopathies, Kabuki Syndrome and other rare/orphan syndromes and diseases in pediatrics. Their goals are to understand the gene regulatory networks that contribute to diseases. Dr. Yost is dedicated to training and mentoring the next generation, with emphasis on building pipelines from primary schools through postdoctoral programs for historically underrepresented groups in the biomedical sciences.

Heidi Rehm
Chief Genomics Officer, Department of Medicine, MGH, Professor of Pathology, MGH, BWH and Harvard Medical School, Medical Director, Broad Institute Clinical Research Sequencing Platform, Harvard

Written bio: Heidi Rehm is the Chief Genomics Officer in the Department of Medicine and at the Center for Genomic Medicine at Massachusetts General Hospital working to integrate genomics into medical practice. She is a board-certified laboratory geneticist, Medical Director of the Broad Institute Clinical Research Sequencing Platform and Professor of Pathology at Harvard Medical School, working to guide genomic testing for clinical and clinical research use. She is a principal investigator of ClinGen, providing free and publicly accessible resources to support the interpretation of genes and variants. Rehm also co-leads the Broad Center for Mendelian Genomics focused on discovering novel rare disease genes and co- leads the Matchmaker Exchange to also aid in gene discovery. She is a strong advocate and pioneer of open science and data sharing, working to extend these approaches through her role as vice chair of the Global Alliance for Genomics and Health. Rehm is also a principal investigator of the Broad-LMM-Color All of Us Genome Center supporting the sequencing and return of results to a cohort of one million individuals in the US and co-leading gnomAD, the Genome Aggregation Database.

Kathleen A. Cooney
Professor of Medicine, Chair in the Department of Medicine, Interim Chair for the Center for Applied Genomics and Precision Medicine, Duke University

She is a medical oncologist focused in caring for men with prostate cancer, and is internationally known for her investigations focused on the genetic epidemiology of prostate cancer.
Her research led to the important discovery of a recurrent mutation in the HOXB13 gene that increases the chances of being diagnosed with prostate cancer and is estimated to account for 5 percent of hereditary prostate cancer cases worldwide. Since men with HOXB13 mutations are at an increased risk of prostate cancer, they may benefit from participation in screening and potentially prevention protocols in the future. Dr. Cooney's research continues with federal funding to identify germline mutations associated with lethal and aggressive prostate cancer as well as prostate cancer in African American men.

Ben Scruggs
Associate at Hatteras Venture Partners and director on the boards of IMMvention Threpeutix and Veralox Therapeutics

Ben Scruggs is an Associate at Hatteras Venture Partners in Durham, NC. He supports the firm's new portfolio company diligence, existing portfolio strategy, and overall operations. Prior to joining Hatteras in 2016, Ben was a postdoctoral fellow in the Epigenetics and Stem Cell Biology Laboratory at the National Institute of Environmental Health Sciences. He has performed research in the fields of genomics, metabolism, RNA biology, and transcription regulation. Ben is a board observer at Altis Biosystems, Dropworks, Graybug Vision, Myeloid Therapeutics, Qpex Biopharma, and Trefoil Therapeutics. He serves on NHLBI's national network of mentors and the North Carolina Microbiome Consortium Steering Committee. He has served on various committees and panels for the National Cancer Institute, the Council for Entrepreneurial Development, and Southeast Life Sciences. Ben received his B.E. in biomedical engineering from Vanderbilt University and a Ph.D. in molecular cell biology from Washington University in St. Louis.

Jennifer Israel
Associate Director of Genomics, Kriya Therapeutics.

I am a broadly trained PhD scientist and PMP with 8+ years of experience in extracting knowledge and communicating business-relevant insights from large-scale data science projects. Currently, I lead the Genomics team at Kriya Therapeutics.

Susanne Haga
Associate Professor in Medicine, Associate Research Professor in the Sanford School of Public Policy, Associate Research Professor of Biology, Duke University

My research interests focus on issues affecting the translation of genomics to clinical practice. Specifically, I have a strong interest in education, with each of my research projects involving some component of professional, public or patient education, including development of educational materials about genomic research in general, pharmacogenetic testing, and communicating genetic test results, in addition to undergraduate teaching in genetics/genomics, ethics, and policy.

Chris Gunter
Associate Investigator, Social and Behavioral Research Branch, Senior Advisor to the Director of Genomics Engagement, NHGRI

Dr. Chris Gunter earned her Ph.D. in human genetics at Emory University in 1998, studying fragile X syndrome and mechanisms of dynamic mutation. She then moved to Case Western Reserve University and completed both postdoctoral work on X chromosome inactivation and an editorial fellowship at the journal Human Molecular Genetics. From 2002 to 2008, Dr. Gunter served as a senior editor for the journal Nature, handling the areas of genetics, genomics, and gene therapy. She then joined the HudsonAlpha Institute for Biotechnology as the director of research affairs, where her responsibilities included creating an academic environment, teaching at the Universities of Alabama Huntsville and Birmingham, and providing scientific content for multiple audiences. After serving as the Program Committee Chair for the American Society of Human Genetics, she worked with students from Stanford University to study how gender influences participation in scientific conferences, and whether public discussion of the imbalance can have an effect.

Lucia Hindorff
Epidemiologist, Division of Genomic Medicine, NHGRI

Dr. Hindorff is an epidemiologist and program director in the Division of Genomic Medicine at NHGRI. She received her M.P.H. and Ph.D. degrees from the University of Washington, where her research focused on cardiovascular genetic epidemiology and motivating factors for using genetic tests in clinical care. At NHGRI, Dr. Hindorff is the lead Program Director for the Clinical Sequencing Evidence-Generating Research (CSER) program, a consortium to assess the clinical utility of genome sequencing in diverse settings and populations, and for the Polygenic Risk Score (PRS) Diversity Consortium, an upcoming consortium to collaboratively generate and refine PRS for populations of diverse ancestry. Dr. Hindorff is also the project scientist for the Population Architecture using Genomics and Epidemiology (PAGE) program, a consortium formed to expand understanding of ancestral differences in genomic disease associations in large, diverse, well-characterized cohorts. She is also the NHGRI scientific lead for the online NHGRI Genome-wide Association Study catalog. She

has authored or co-authored over 100 publications and enjoys working with trainees and experienced investigators alike. In addition to managing her scientific portfolio, Dr. Hindorff is broadly interested in health information disparities, the integration of genomic tests into clinical care and practical issues related to large epidemiological studies.

Lisa Chadwick
Program Director Genome Sciences, Division of Genome Sciences, NHGRI

Lisa Helbling Chadwick, Ph.D. joined the National Human Genome Research Institute's Extramural Research Program as a program director in 2018. She oversees the Centers for Mendelian Genomics within the NHGRI Genome Sequencing Program. Prior to joining NHGRI, Dr. Chadwick was a program director in the Division of Extramural Research and Training at the National Institute of Environmental Health Sciences (NIEHS), where she was involved in the leadership of the NIH Roadmap Epigenomics Program, and the NIH 4D Nucleome Program. Dr. Chadwick received a B.A. in biology from Case Western Reserve University, a Ph.D. in genetics from Case Western Reserve University, and completed postdoctoral research at NIEHS.

Mike Snyder
Ascherman Professor and Chair of Genetics and the Director of the Center of Genomics and Personalized Medicine at Stanford University, Stanford

Michael Snyder, PhD, is the Ascherman Professor and Chair of Genetics and the Director of the Center of Genomics and Personalized Medicine at Stanford University. He is a leader in the field of functional genomics and proteomics, and a major participant-in the ENCODE project. His laboratory was the first to perform a large- scale functional genomics project in any organism and has developed many technologies used in genomics and proteomics research, including the development of proteome chips, high resolution tiling arrays for the entire human genome, methods for global mapping of transcription factor binding sites (ChIP-chip now replaced by
ChIP-seq), paired end sequencing for mapping of structural variation in eukaryotes, de novo genome sequencing of genomes using high throughput technologies and RNA-Seq. These technologies have been used to characterize genomes, proteomes and regulatory networks. Seminal findings from the Snyder laboratory include the discovery that much more of the human genome is transcribed and contains regulatory information than was previously appreciated and that a high diversity of transcription factor binding occurs both between and within species. He has also combined different state-of-the-art “omics” technologies to perform the first longitudinal detailed integrative personal omics profile (iPOP) of person and used this to assess disease risk and monitor disease states for personalized medicine. He also is a cofounder of several biotechnology companies.

Charles Gersbach
Rooney Family Associate Professor of Biomedical Engineering

The Gersbach Lab is dedicated to applying innovative methods in molecular and genetic engineering to regenerative medicine, treating genetic disease, and enhancing our understanding of fundamental biological processes. In particular, our research aims to develop new technologies to modify genome sequences, epigenomic regulation, and cellular gene networks in a precise and targeted manner. These new technologies are then applied to correction of genetic diseases, directing cell differentiation, tissue regeneration, drug target discovery, or answering fundamental biological questions regarding gene regulation and genome structure and function. Examples of technologies used in our research include genome and epigenome editing with CRISPR/Cas9 and other DNA-targeting systems, protein engineering, directed evolution, genetic reprogramming, and optogenetics.

Ornit Chiba-Falek
Professor in Neurology, Duke University

Genetics plays an incredibly complex role in how neurodegenerative diseases like Alzheimer's and Parkinson's diseases appear and develop. Even small changes in the DNA sequence and structure can directly alter the protein product of a gene, or change how, when, and/or where a gene or a group of genes are expressed; these effects determine whether a disease will occur, when it happens, and the extent of its symptoms. Our research attempts to better understand the genetic processes underpinning age-related neurodegenerative diseases, in particular Alzheimer's disease, related dementia, and Lewy body spectrum disorders.

Debra Dianne Murray
Assistant Professor, Baylor College of Medicine

Faculty, administrator, instructor, and mentor. Develop diversity and inclusion activities. Train under-represented groups in genetics and genomics to gain admission into graduate school. 100% of the summer interns obtain bachelor degrees; 70% of our post-baccalaureate students enter Ph.D. programs, and 100% of pre-doctoral alumni are retained in Ph.D. programs. Since 2003, a total of 22 students have already earned a Ph.D.

Steven Reilly
Assistant Professor of Genetics, Yale School of Medicine

Steve is a genomicist specializing in human genetics, evolution, and gene-regulation. He is specifically interested in furthering our understanding of non-coding variation, the main cache of human genetic diversity. He develops novel computational + experimental approaches to identify and functionally characterize human variation at scale. These tools include *DeepSweep:* a machine learning method to identify variants under positive selection, *HCR-FlowFISH*: a method to directly characterize the functional targets of regulatory elements, and application of the Massively Parallel Reporter Assay (MPRA) to understand the regulatory impact of genomic variation. Steve completed his B.S. at Carnegie Mellon University, studying recursive splicing in the laboratory of Javier Lopez. He wouldn't be a scientist today without the generous early mentorship and support he received from Beth Jones, the Beckman Scholars Program, and the HHMI summer researchers program. Steve completed his PhD from Yale University in the Department of Genetics. He studied the evolution of regulatory elements in the developing human cortex in the lab of James Noonan. He completed his postdoctoral work in the Sabeti lab at Harvard University and The Broad Institute. His awards include an NHGRI NIH Pathway to Independence Award (K99), an NHGRI Ruth L. Kirschstein National Research Service Award (NRSA), the Carolyn Slayman Thesis Prize, and was a Beckman Scholar awardee. Steve is passionate about making science more inclusive and improving training for students in the genomic age. Outside the lab, you can find him biking, taking an overly scientific approach to his garden, making beer, and glass blowing.

Shurjo Sen
Program Director, Division of Genome Sciences, NHGRI

Dr. Sen joined the National Human Genome Research Institute's Extramural Research Program as a program director in 2019. He manages a portfolio of grants focused upon genomic data sciences, and is particularly interested in transitioning genomics from a centralized data repository model to cloud-based collaborative science. Apart from genomic data science, Dr. Sen's grant portfolio also includes genomic technology development, including computational technologies. Dr. Sen also has an interest in training initiatives at NHGRI that aim to create an expanded and diverse bioinformatics workforce for managing the massive data volumes being produced in genomics. Prior to his current position, Dr. Sen worked at NHGRI's Intramural Research Program studying transcriptome changes in coronary artery disease, which was recognized through the C.W. Cotterman Award from the American Society of Human Genetics in 2014. Between 2016-2019, he served as the co-director of NCI's Microbiome and Genetics Core Laboratory, where he developed and implemented an array of robotics-based microbiome sequencing methods and corresponding analysis software to help identify bacterial and fungal community changes associated with human disease. He received his B.Sc. (Hons.) and M.Sc. degrees in zoology (in 2001 and 2003, respectively) from the University of Calcutta, his Ph.D. in biological sciences from Louisiana State University (in 2008) and completed postdoctoral training at NHGRI (2008-2013).

Tim Reddy
Associate Professor, Duke University

Dr. Reddy's research focuses on understanding how genetic variation alters gene regulation and contributes to human disease. Strong evidence suggests that most of the heritability of complex human phenotypes is due to such regulatory variation. In cases where variation in gene regulation contributes to disease, major challenges persist in the ability to identify the specific causal mutations; the regulatory mechanisms that they disrupt; and genes that are regulated. Overcoming those obstacles will greatly benefit society by revealing new opportunities for prediction and treatment of disease and will provide deeper understanding into the types of variation upon which evolution acts on short time scales. His lab has pioneered development of new high-throughput strategies to measure the activity of human gene regulatory elements and he has led the development of using such standard and high-throughput reporter assays to identify genetic impacts on gene regulation that contribute to traits and diseases. Dr Reddy is also actively engaged in developing and applying new tools to directly modify the genome and epigenome, with a particular focus on identifying and compensating for defects in mechanisms of gene regulation that lead to disease

PARTICIPANTS

First Name	Last Name	Program
Nia	Abdurezak	Tufts University
Rogelio	Aguilar	Baylor College of Medicine
Josh	Akey	Princeton University
Olayemi	Akintunde	UC Santa Cruz Genomics Institute
Titilope	Akinwe	Washington University in St. Louis
Syed	Ali	The Jackson Laboratory
Hannah	Allen	University of Utah
Benjamin	Alva	University of Minnesota-Twin Cities
Sara	Amirkiai	UC Santa Cruz Genomics Institute
Leah	Anderson	University of Washington
Nathan	Anderson	University of Wisconsin-Madison
Rebecca	Anderson	University of Utah
Leslie	Andriani	University of Pennsylvania School of Medicine
Anne-Cara	Apple	University of Pennsylvania
Laya	Ashley	UC Santa Cruz Genomics Institute
Rachael	Aubin	University of Pennsylvania
Melica	Baboldashtian	UC Santa Cruz Genomics Institute
Minoo	Bagheri	Vanderbilt Genomic Medicine Training Program - T32
Abena	BakenRa	Genomics Summer Research for Minorities - University of Utah
Greg	Barsh	HudsonAlpha Institute for Biotechnology
Julie	Beans	Southcentral Foundation
Daniel	Ben-Isvy	Harvard University

Abby	Bergman	Stanford University
Nathan	Bihlmeyer	Duke University
Dawn	Billman	Stanford University
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Alexander	Boulgakov	University of Washington
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Joy	Boyer	NIH/NHGRI
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Michael	Brent	Washington University
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Garrett	Brown	University of Utah
Maja	Bucan	University of Pennsylvania
Carol	Bult	The Jackson Laboratory
Dave	Burke	University of Michigan
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Grace	Byfield	UNC Chapel Hill, Genetics
Diego	Calderon	University of Washington
Jayda	Caldwell	The University of Alabama at Birmingham
Katharine	Callahan	University of Pennsylvania, MEHP & CHOP
Conor	Camplisson	University of Washington
Grace	Carter	Broad Institute of MIT and Harvard
Lisa	Chadwick	NHGRI
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Rachael	Chanin	Stanford University School of Medicine

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Rachel	Cohn	UCONN Health
Laura	Colbran	University of Pennsylvania
Heather	Colley	National Human Genome Research Institute
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Gabriel	Dolsten	Princeton University
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Cecily	Gibson	Baylor College of Medicine and Hampton University
Matthew	Gill	Stanford University
Vincent	Gillespie	Washington University in St. Louis
Rachel	Gilmore	UConn Health Center
Kyle	Gontjes	University of Michigan
Gracie	Gordon	UCSF
BETTIE	GRAHAM	NIH/NIHGRI
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Stephanie	Hicks	Johns Hopkins University
Lucia	Hindorff	NHGRI
Brian	Ho	Stanford University
WENPIN	HOU	Johns Hopkins University
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Chris	Hsu	University of Washington
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Tanner	Jensen	Stanford School of Medicine
Hongkai	Ji	Johns Hopkins University
Sarah	Ji	UCLA
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Lauren	Johnson	Washington University in St. Louis
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Jon	Judd	Stanford University
Julius	Judd	Cornell University
Seok Woo	Jung	Washington University in St. Louis
Jessica	Kain	Stanford University
Sandeep	Kambhampati	Harvard University
Nolan	Kamitaki	Harvard University
Marie	Kaniecki	University of Michigan
Alla	Karpova	Washington University St Louis
Moriah	Katt	University of Wisconsin-Madison
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Junhyong	Kim	University of Pennsylvania
Minji	Kim	The Jackson Laboratory for Genomic Medicine
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Rachel	Knoener	University of Wisconsin-Madison
Bruce	Korf	The University of Alabama at Birmingham
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Apoorva	Mandavilli	NY Times
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Lucas	Matthews	Columbia University
Kaia	Mattioli	Brigham and Women's Hospital
Evonne	McArthur	Vanderbilt University
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Liz	McDonough	GE Research (HuBMAP)
Imani	McGregor	Berman Institute of Bioethics
Amy	McGuire	BCM
Ryan	McNulty	Princeton University
Ijeoma	Meremikwu	University of Pennsylvania
Rachel	Mester	UCLA
Gwen	Miller	Harvard University
Kevin	Mintz	Stanford Center for Biomedical Ethics
Jason	Mohabir	Broad Institute of MIT and Harvard
Javier	Montelongo	University of Pennsylvania
Stephen	Montgomery	Stanford University
Jennifer	Montooth	NIH/National Human Genome Research Institute
Rebecca	Mueller	University of Pennsylvania, MEHP
Shandu	Mulaudzi	Harvard University
Camille	Mumm	University of Michigan
Hannah	Mundinger	University of Utah
Debra	Murray	Baylor College of Medicine
Katherine	Nathanson	University of Pennsylvania School of Medicine
Shakila	Nawaz	University of Utah
Katherine	Neimeyer	Southcentral Foundation
Julia	Nepper	University of Wisconsin-Madison
Marina	Nogueira	Washington University in St. Louis
Sonresa	Ochoa-Vidales	Genomics Summer Research for Minorities - University of Utah

Frank	Ockerman	University of Michigan
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Erin Loss	Ostrem	University of Wisconsin-Madison
Kellie	Owens	University of Pennsylvania
Pablo	Oyler-Castrillo	Princeton University
Rachel	Paolini	Washington University in St. Louis
Louise	Pape	University of Wisconsin-Madison
Jeanette	Papp	UCLA
Peter	Park	Harvard Medical School
Lisa	Parker	University of Pittsburgh
Alejandro	Pereira	Genomics Summer Research for Minorities - University of Utah
Wolfgang	Pernice	Columbia University
Tolulope	Perrin-Stowe	University of Wisconsin-Madison
Bria	Persaud	Broad Institute of MIT and Harvard
Trenton	Peters-Clarke	University of Wisconsin-Madison
Josh	Peterson	Vanderbilt Genomic Medicine Training Program - T32
Versha	Pleasant	University of Michigan
Sabrina	Powell	UNC Program for Precision Medicine in Health Care
Audrey	Pozernick	University of Utah
Tejashree	Prakash	Genomics Summer Research for Minorities - University of Utah
Kara	Quaid	Washington University in St. Louis
Vasiliki	Rahimzadeh	Stanford Center for Biomedical Ethics
Deisy	Ramos	Baylor College of Medicine
Gregory	Raskind	Harvard University
Chinmay	Raut	University of Michigan
Tim	Reddy	Duke University
Tavis	Reed	Princeton University
Heidi	Rehm	Massachusetts General Hospital and Broad Institute
David	Reid	The University of Alabama at Birmingham
Steven	Reilly	Yale University - Genetics
Diana	Reyna	UC Santa Cruz Genomics Institute
Megan	Richters	Washington University in St. Louis
Andrea	Riner	University of Florida
Marylyn	Ritchie	University of Pennsylvania School of Medicine
Milagros	Rivera	UC Santa Cruz Genomics Institute
Paul	Robbins	Duke University
Monica	Roberson	Broad Institute of MIT and Harvard
Eugenia	Roberts	Broad Institute of MIT and Harvard
Scott	Roberts	University of Michigan ELSI Research Training Program
Gonteria	Robinson	Baylor College of Medicine

Nathaniel	Robinson	The University of Alabama at Birmingham
Cristina Adriana	Rodriguez	University of Utah
Diego	Rodriguez	Broad Institute of MIT and Harvard
Erin	Rothwell	University of Utah
Robb	Rowley	National Human Genome Research Institute
Craig	Rush	University of Utah / Huntsman Cancer Institute
Tiffany	Russell	University of Michigan
Sofie	Salama	UC Santa Cruz Genomics Institute
Asa	Samuels	University of Oklahoma- Genomics and Ethics Program for Native Students
Morgan	Sanchez	Harvard University
Venkat	Sankar	Stanford University (Department of Genetics)
Loren	Saulsberry	The University of Chicago
Bobby	Saunkeah	Chickasaw Nation
Kate	Saylor	University of Pennsylvania, MEHP
Naomi	Scheinerman	University of Pennsylvania, MEHP
Alina	Schmidt	Washington University in St. Louis
Jacob	Schreiber	Stanford University
Michelle	Schultz	Baylor College of Medicine
David	Schwartz	University of Wisconsin-Madison
Ben	Scruggs	Venture Capital
Shurjo	Sen	NHGRI
Lia	Serrano	University of Wisconsin-Madison
Svati	Shah	Duke Health
Jack	Shanahan	Stanford
Jennifer	Shaw	Southecentral Foundation
Lilian	Shen	University of Florida
Colin	Shew	UC Davis
Ahmed	Shuaibi	Princeton University
Jim	Skeath	Washington University in St. Louis
Gloria	Slattum	Genomics Summer Research for Minorities - University of Utah
Hadley	Smith	Baylor College of Medicine
Mary	Smithson	The University of Alabama at Birmingham
Jordan	Smoller	Massachusetts General Hospital
Michael	Snyder	Stanford University
Eric	Sobel	UCLA
Kayte	Spector-Bagdady	University of Michigan Medical School
Sarah	Spendlove	UCLA
Cody	Steely	University of Utah School of Medicine
Sarah	Stofel	The Jackson Laboratory
John	Storey	Princeton University

Kari	Strouse	Duke University
Tim	Stuart	NYGC
Amanda	Sun	Princeton University
Mike	Sweeney	University of Michigan
Elizabeth	Szabo	University Of Connecticut Health Center
James	Tabery	University of Utah
Holly	Tabor	Stanford Center for Biomedical Ethics
Gnoulelein	Tako	Genomics Summer Research for Minorities - University of Utah
Michelle	Tang	University of Washington / PNRI
Lorenzo	Thompson	The University of Alabama at Birmingham
Mike	Thompson	UCLA
Saige	Thompson	The University of Alabama at Birmingham
Abigail	Thorpe	University of Washington
Lam	Tran	University of Michigan
Fotios	Tsetsos	The Jackson Laboratory
Krystal	Tsosie	Native BioData Consortium
Katharine	Tsukahara	Children's Hospital of Philadelphia
Nana	Twumasi-Ankrah	Harvard University
Scott	Tyler	Icahn School of Medicine at Mount Sinai
Lilen	Uchima	HMS - Dept of Biomedical Informatics
Raeline	Valbuena	Stanford University
Raphael	Valdivia	Duke University
Kinsey Deynze	Van	University of Michigan
Rhiannon	Vargas	Washington University in St. Louis
Gisselle	Vélez-Ruiz	Broad Institute of MIT and Harvard
Madeika	Vercella	Genomics Summer Research for Minorities - University of Utah
Meghan	Wachira	University of Pennsylvania
Sarah	Walker	Princeton University
Bruce	Wang	Princeton University
Lily	Wang	Harvard University
Robert	Wang	University of Pennsylvania
Megan	Washington	Baylor College of Medicine
Alex	Wei	University of Pennsylvania
Anne	West	Duke University
Peggy	White	University of Michigan
Penny	White	Johns Hopkins Berman Institute of Bioethics
Michael	Wilkinson	Washington University in St Louis School of Medicine
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Matthew	Wooten	University of Washington / FHCRC

Gregory	Wray	Duke University
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H. Joseph	Yost	University of Utah
Joseph	Yracheta	Native BioData Consortium
Cynthia	Zajac	University of Michigan
Ronghao	Zhou	Stanford