National Human Genome Research Institute

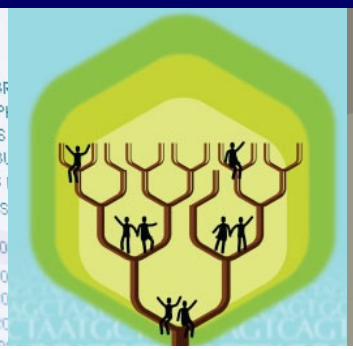
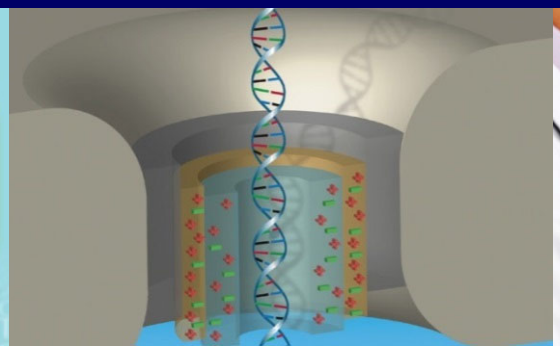
The Forefront of Genomics®

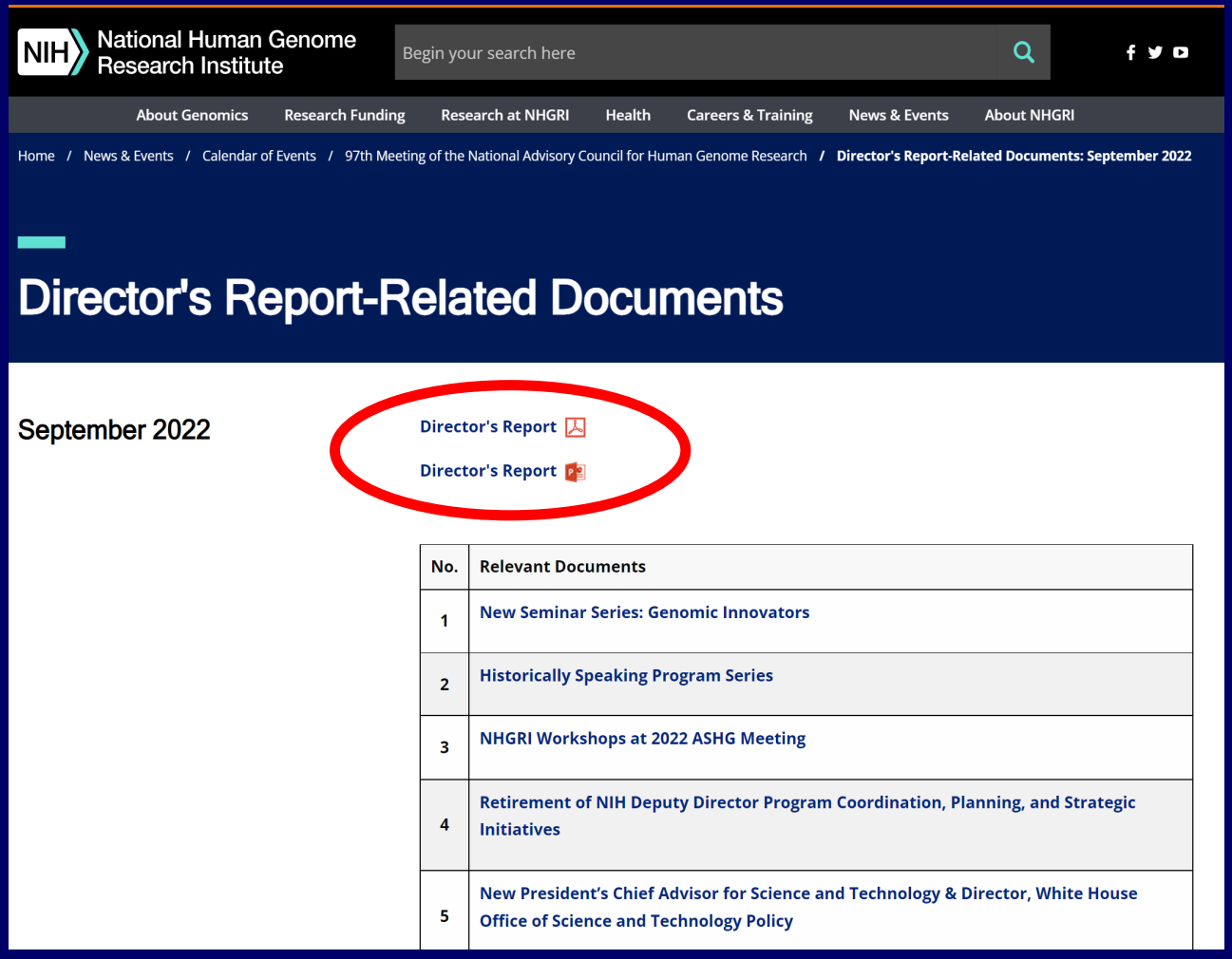
DIRECTOR'S REPORT

Eric Green, M.D., Ph.D.

Director, NHGRI

September 2022



genome.gov/DirectorsReport

Document #

Open Session Agenda

Presentations:

NIAMS Research – Focus on Genomics and Genetics
Lindsey Criswell

Genomics & Society Working Group of Council Annual Report
Malia Fullerton

Open Session Agenda

Concept Clearances:

Genomic Community Resources PAR Renewal
Chris Wellington

Genomics and Health Equity Initiatives RFAs
Lucia Hindorff

Entry Level Training Modules (ELM) PAR
Renee Rider

Center for Inherited Disease Research Contract Renewal
Lawrence Brody

Open Session Agenda

Presentations:

Human Genome Reference Program
Deanna Church and Martin Hirst

Capturing RNA Sequences & Transcript Diversity Meeting
Jennifer Strasburger and Brenton Graveley

Director's Report Outline

I. General NHGRI Updates

II. General NIH Updates

III. General Genomics Updates

IV. NHGRI Extramural Research Program

V. NIH Common Fund/Trans-NIH

VI. NHGRI Communications, Policy, and Education

VII. NHGRI Intramural Research Program

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New Extramural Program Director

Iman Martin, Ph.D., M.P.H., M.Sc.

New Extramural Program Director

Renee Rider, M.S., J.D., L.C.G.C.

New Extramural Program Director

Sandhya Xirasagar, Ph.D.

New NIH-ACMG Fellows

Julius Militante,
Ph.D., R.N.

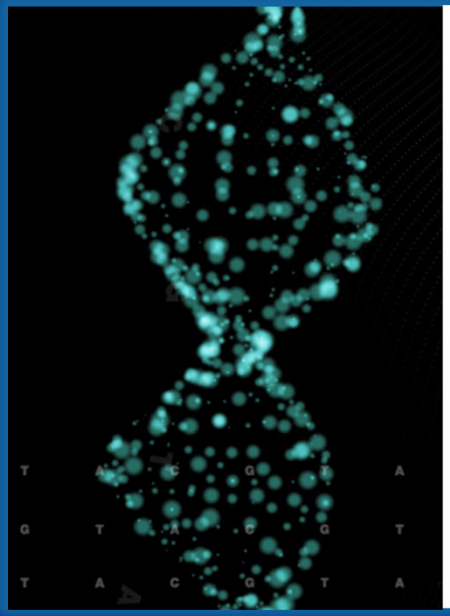
Veronica Abraham,
M.D., M.P.H., M.Sc.

New ASHG-NHGRI Fellows

Albert Hinman, Ph.D.
Genetics & Public Policy Fellow

Nancy Sey, Ph.D.
Genetics & Education Fellow

New Seminar Series: Genomic Innovators



Playing genomic battleship with CRISPR technologies to uncover non-coding functional elements and their phenotypic effects

September 29, 2022, 3:00 - 4:15 p.m. ET

Speakers:

- **Luca Pinello, Ph.D.**
  Harvard Medical School & Massachusetts General Hospital

- **Karen Mohlke, Ph.D.**
  University of North Carolina

- An early career researcher and an established researcher
- Topics that showcase creative ways early career investigators are accelerating genomics research

Document 1

Historically Speaking Program Series

- Four-part program series focused on advances made by African Americans in biomedical research and genomics
- Next programs: October 20, November 15, and December 6

Document 2

NHGRI Workshops at 2022 ASHG Meeting

- **Applying for NIH Grants: Strategies for Success**

  Wednesday, October 26

- **NHGRI Building a Diverse Workforce – Listening to the Voices of Trainees and Early Stage Scientists**

  Thursday, October 27

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Retirement of NIH Deputy Director for Program Coordination, Planning, and Strategic Initiatives

James Anderson, M.D., Ph.D.

Robert Eisinger, Ph.D.

Document 4

New President's Chief Advisor for Science and Technology & Director, White House Office of Science and Technology Policy

Arati Prabhakar, Ph.D.

Document 5

New Director, Advanced Research Projects Agency for Health (ARPA-H)

Renee Wegryzn, Ph.D.

New Director, National Cancer Institute

Monica Bertagnolli, M.D.

NIH NATIONAL CANCER INSTITUTE

Document 7

New NIH Acting Deputy Director for Intramural Research

Nina Schor, M.D., Ph.D.,

NIH Intramural

New Director, NIH Office of Equity, Diversity, and Inclusion

Kevin Williams, J.D.

NIH National Institutes of Health
Office of Equity, Diversity, and Inclusion

Document 9

NIH Data Management and Sharing Policy

- Effective January 25, 2023
- Policy Requirements:
  - Submission of Data Management and Sharing Plan
  - Compliance with any institute/center-approved plan(s)
- NHGRI preparing for implementation of this policy

Document 10

Fiscal Year 2023 Appropriations

	FY2022 Enacted Labor-HHS Appropriation	FY2023 House Committee Passed	% Increase	FY2023 Senate Committee Majority Draft	% Increase
NIH	$45 B	$47.5 B	5.56%	$48.0 B	6.66%
NHGRI	$639.062 M	$659.233 M	3.16%	$658.873	3.10%

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Mourning the Loss of Leon Rosenberg

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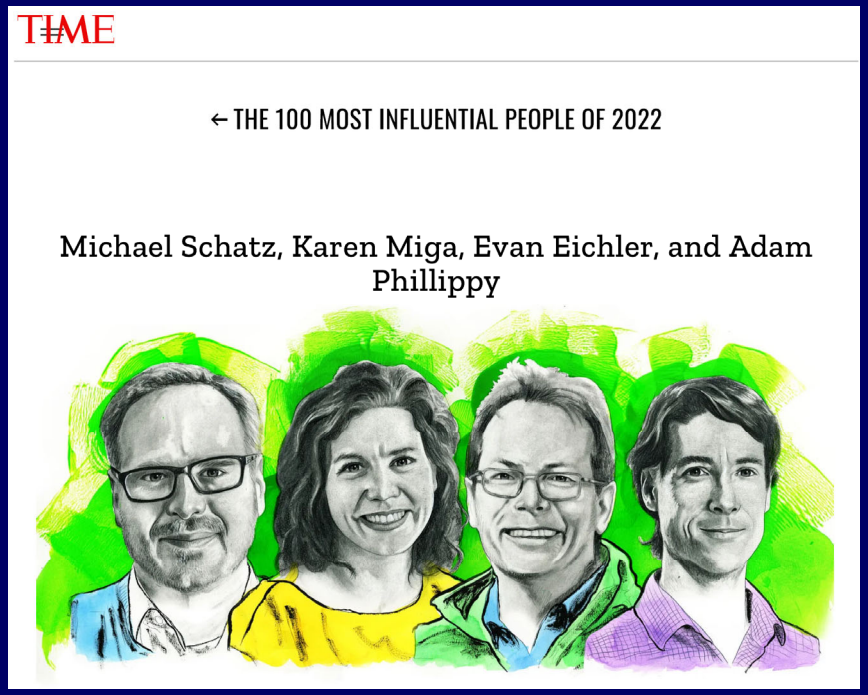
New Leadership, American Society of Human Genetics

Bruce Gelb, M.D.

Chris Gunter, Ph.D.

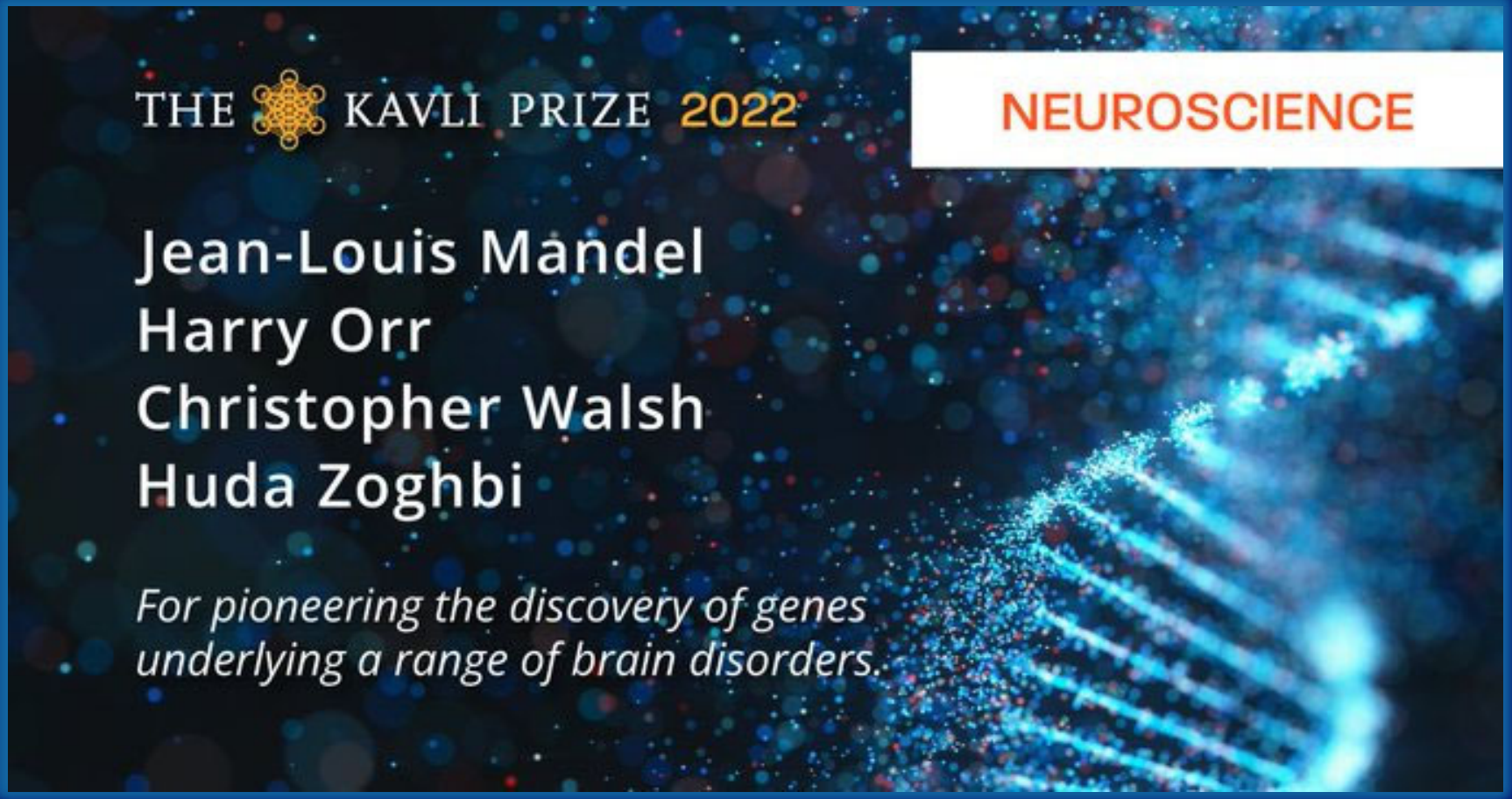
Document 13

Time 100 Most Influential People of 2022

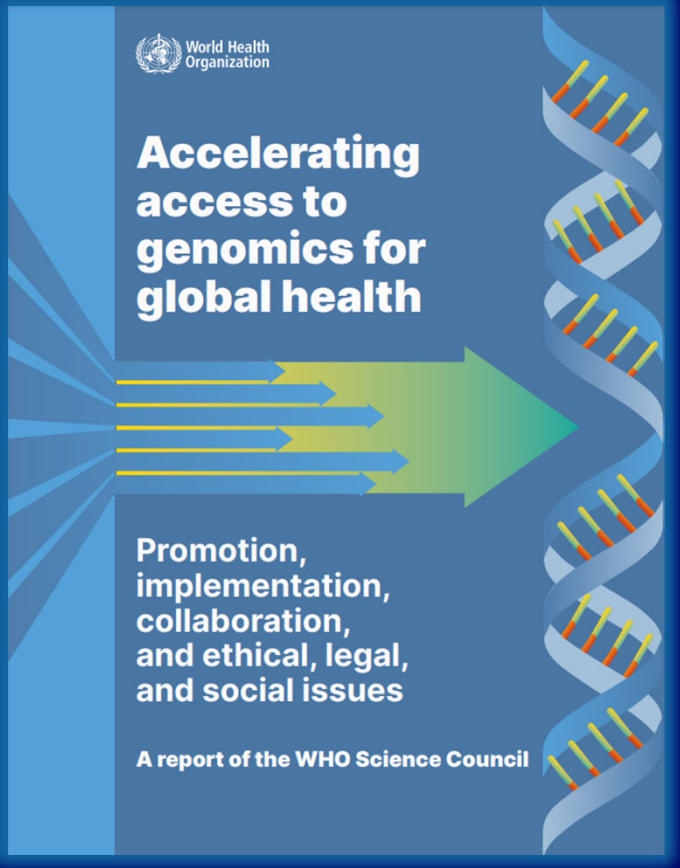


Document 14

Kavli Prize in Neuroscience



New World Health Organization Science Council Report



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Does Life Get Any Better Than This?

Genomics + Baseball

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Human Genome Reference Program

Towards a Complete Reference of Human Genome Diversity

- Generating 350 high-quality reference human genome sequences
  - Initial 45 diploid genome sequences released
  - Pangenome representations available
- Embedded ELSI efforts
- International outreach: GA4GH & H3Africa

Molecular Phenotypes of Null Alleles in Cells (MorPhiC)

Molecular Phenotypes of Null Alleles in Cells (MorPhiC) Phase I: Data Analysis and Validation Centers (U01 Clinical trials not allowed)

U01 Research Project – Cooperative Agreements

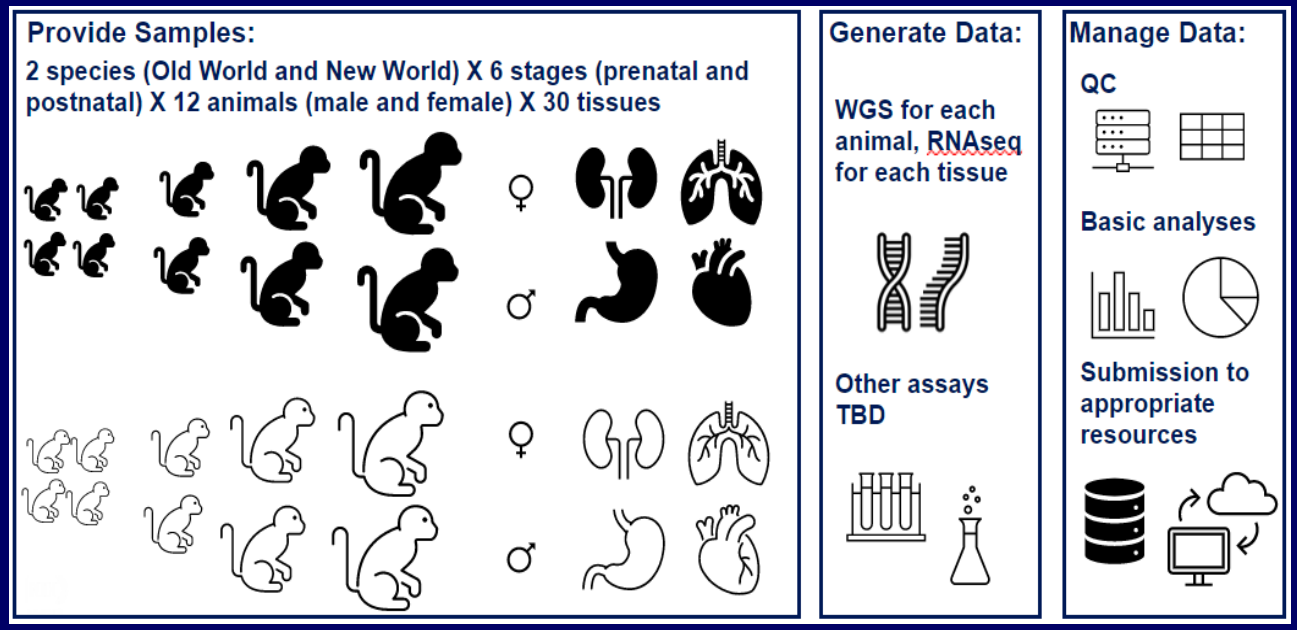
New Funding Opportunity Announcement:

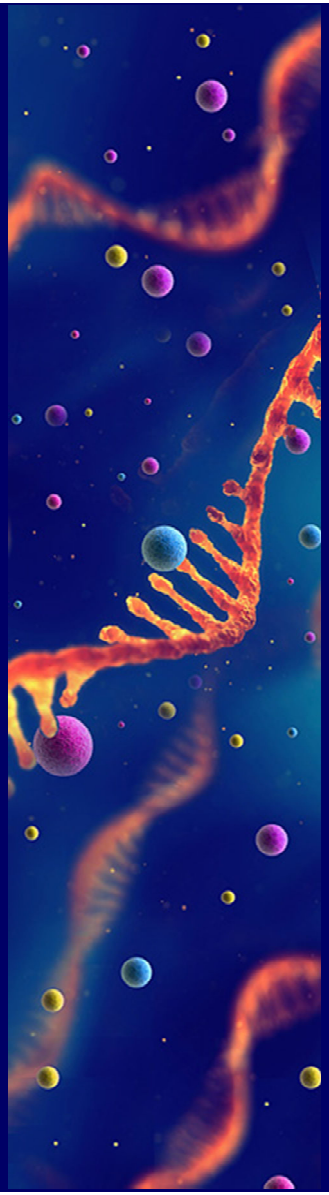
- **RFA-HG-22-019 Data Analysis and Validation Center**
- **Pre-applicant webinar was held in September**
- **Applications due November 1, 2022**

Non-Human Primate Developmental Genotype-Tissue Expression Project (NHP dGTEx)

Multispecies NHP dGTEx Research Center

- Oregon Health and Science University
  - PI: Donald Conrad
- Broad Institute
  - PI: Kristin Ardlie
- Yale University
  - PI: Nenad Sestan
- Massachusetts Institute of Technology
  - PI: Guoping Feng



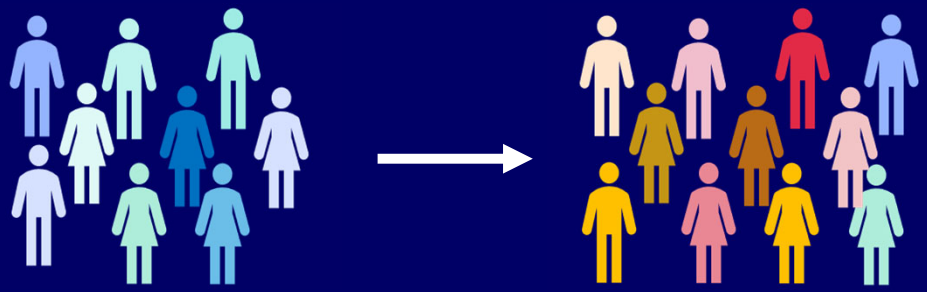


Capturing RNA Sequence and Transcript Diversity, from Technology Innovation to Clinical Application Workshop

- Comprehensive characterization of the true diversity of all RNAs and their modifications
- Recordings available online
- Presentation later today

Document 20

eMERGE network
ELECTRONIC MEDICAL RECORDS AND GENOMICS



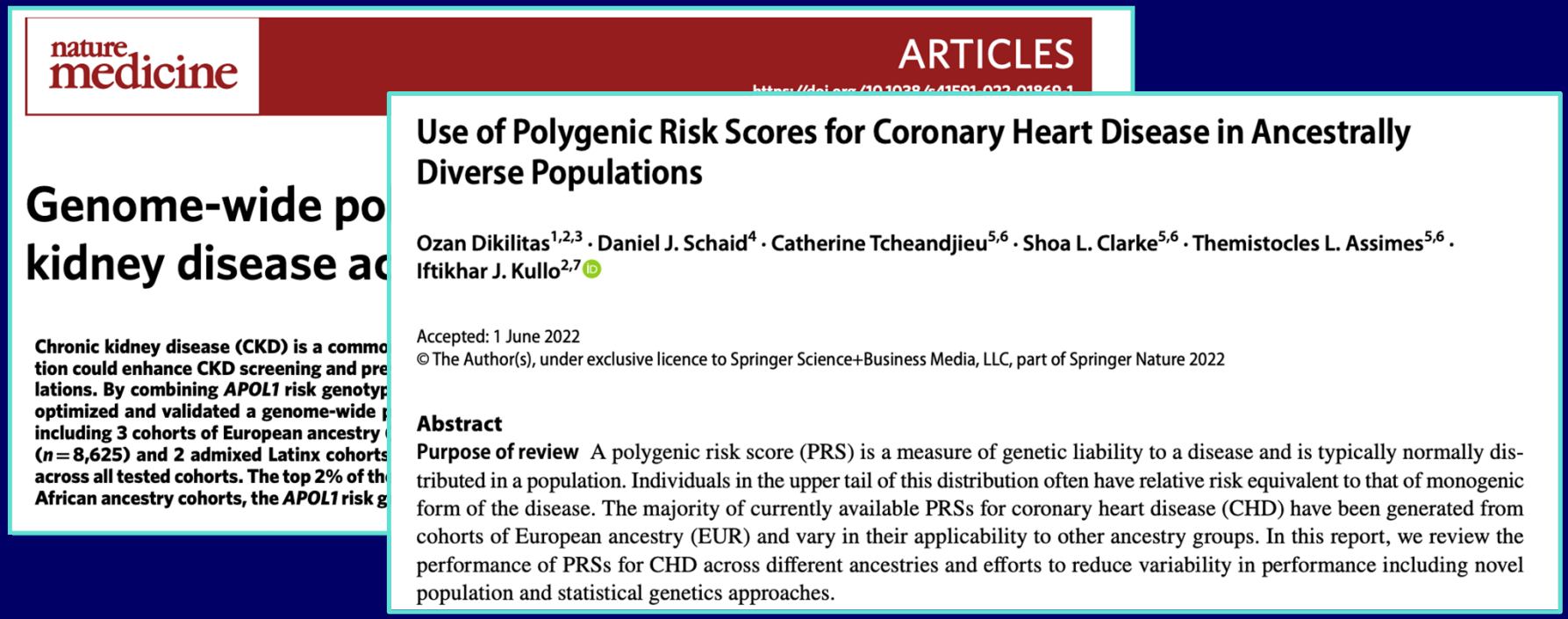
European ancestry

Diverse populations

- Lack of ancestral diversity across genomic datasets is a barrier to understanding and managing disease risk in diverse populations
- 6/10 clinical sites recruiting enhanced diversity cohort

eMERGE network
ELECTRONIC MEDICAL RECORDS AND GENOMICS

Generation of polygenic risk scores for ancestrally diverse populations



nature medicine

ARTICLES

Genome-wide po
kidney disease ac

Chronic kidney disease (CKD) is a commo
tion could enhance CKD screening and pre
lations. By combining *APOL1* risk genotyp
optimized and validated a genome-wide
including 3 cohorts of European ancestry
($n = 8,625$) and 2 admixed Latinx cohorts
across all tested cohorts. The top 2% of th
African ancestry cohorts, the *APOL1* risk g

Use of Polygenic Risk Scores for Coronary Heart Disease in Ancestrally Diverse Populations

Ozan Dikilitas[1,2,3] · Daniel J. Schaid[4] · Catherine Tcheandjieu[5,6] · Shoa L. Clarke[5,6] · Themistocles L. Assimes[5,6] · Iftikhar J. Kullo[2,7]

Accepted: 1 June 2022

Abstract

Purpose of review A polygenic risk score (PRS) is a measure of genetic liability to a disease and is typically normally distributed in a population. Individuals in the upper tail of this distribution often have relative risk equivalent to that of monogenic form of the disease. The majority of currently available PRSs for coronary heart disease (CHD) have been generated from cohorts of European ancestry (EUR) and vary in their applicability to other ancestry groups. In this report, we review the performance of PRSs for CHD across different ancestries and efforts to reduce variability in performance including novel population and statistical genetics approaches.

Multi-Omics for Health and Disease

Funding Opportunities:

- **Disease Study Sites**
  RFA-HG-22-008
- **Omics Productions Center(s)**
  RFA-HG-22-009
- **Data Analysis and Coordination Center**
  RFA-HG-22-010

Pre-application webinar: September 26, 2022
Letters of intent due: October 18, 2022
Application due date: November 19, 2022

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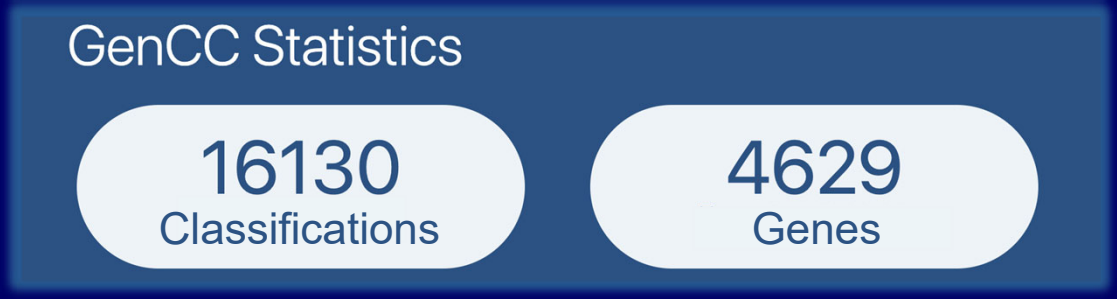
Clinical Genome Resource (ClinGen)

Gene Curation Coalition (GenCC)



Members

Genomic Medicine XIV:
Genomic Learning Healthcare Systems (gLHS)

- Explore real-world examples of gLHS
- Examine barriers and identify potential solutions from current, successful gLHS
- Share solutions and develop collaborations to facilitate gLHS implementation

Technology Development Program

2022 Advances in Genomic Technology Development Meeting

Meeting Topics:

- Current Research
  - Genome Structure & Function
  - Functional Genomics
  - New Sequencing Technology
  - RNA Sequencing
  - Nanopore Sequencing
  - Nucleic Acid Synthesis
- Strategies for Commercialization
- Trainee Career Paths

Technology Development Program

Funding Opportunities

- **Transformative Nucleic Acid Sequencing Technology Innovation and Early Development**
  - RFA-HG-21-006 (R01, also linked R21 and R43/R44)
  - Final due date: February 2, 2023

- **Advancing Genomic Technology Development for Research and Clinical Application**
  - NOT-HG-21-018, Notice of Special Interest (NOSI)
  - R01, R21, R41/R42, and R43/R44
  - Standard receipt dates

Small Business Program

Funding Opportunities

- **Development of Highly Innovative Tools and Technology for Analysis of Single Cells**
  - PA-20-025 (STTR R41/R42 and linked SBIR R43/R44)
- **Small Business Initiatives for Innovative Diagnostic Technology for Improving Outcomes for Maternal Health**
  - NOT-EB-21-001, Notice of Special Interest (NOSI)
- **Genomics Education Interactive Digital Media Resources (SBIR/STTR)**
  - NOT-HG-21-038, Notice of Special Interest (NOSI)
- **These funding opportunities have standard due dates**

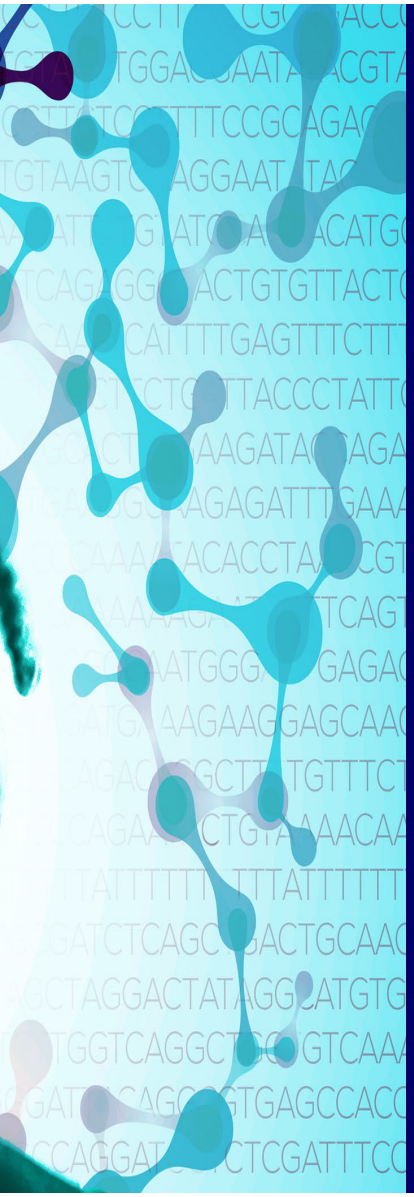
Genomics Workforce Diversity Funding Opportunities

- **PAR-21-143: NHGRI Predoctoral to Postdoctoral Transition Award for a Diverse Genomics (F99/K00) Workforce**

  Due date: December 8

- **PA-21-071: Research Supplements to Promote Diversity in Health-Related Research**

  Due date: Ongoing



Diversity Centers for Genome Research

Diversity Centers for Genome Research	U54	UG3/UH3
	NOT-HG-22-030	NOT-HG-22-031

Estimated due date: November 29, 2022

GREAT Program

Principal Investigator	MSI/Idea-Eligible Institution	Research Intensive Institutions
Nathaniel Jue	California State University, Monterey Bay	UC Santa Cruz
Jose Garcia-Arraras	University of Puerto Rico, Rio Campus	U. Pittsburgh U. Wisconsin UC Santa Cruz UT Southwestern UC San Francisco Harvard University

Due date: July 1, 2023

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R01 Opportunities for Early Career Researchers

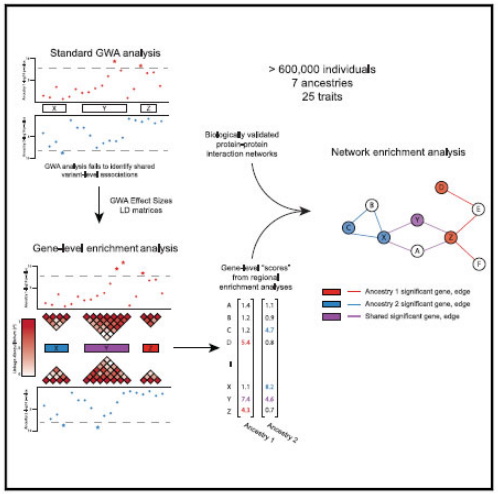
- **New Investigators to Promote Workforce Diversity in Genomics, Bioinformatics, or Bioengineering and Biomedical Imaging Research**
  - RFA-HG-21-041
  - Early Stage Investigators and New Investigators
  - Applications due February 22, 2023
- **Supporting Talented Early Career Researchers in Genomics**
  - RFA-HG-22-001
  - Early Stage Investigators
  - Applications due February 28, 2023

Extramural Investigator-Initiated Highlights

ARTICLE

Enrichment analyses identify shared associations for 25 quantitative traits in over 600,000 individuals from seven diverse ancestries

Graphical abstract



Authors

Samuel Pattillo Smith, Sahar Shahamatdar, Wei Cheng, ..., Genevieve Wojcik, Lorin Crawford, Sohini Ramachandran

Correspondence

sramachandran@brown.edu

- >600K individuals from representing 7 ancestry groups from PAGE study, UK Biobank, & Biobank Japan
- Over 1000 gene-level associations for 25 traits
- Enrichment of mutations in genes associated with triglyceride levels

Extramural Investigator-Initiated Highlights

Trainee Highlights

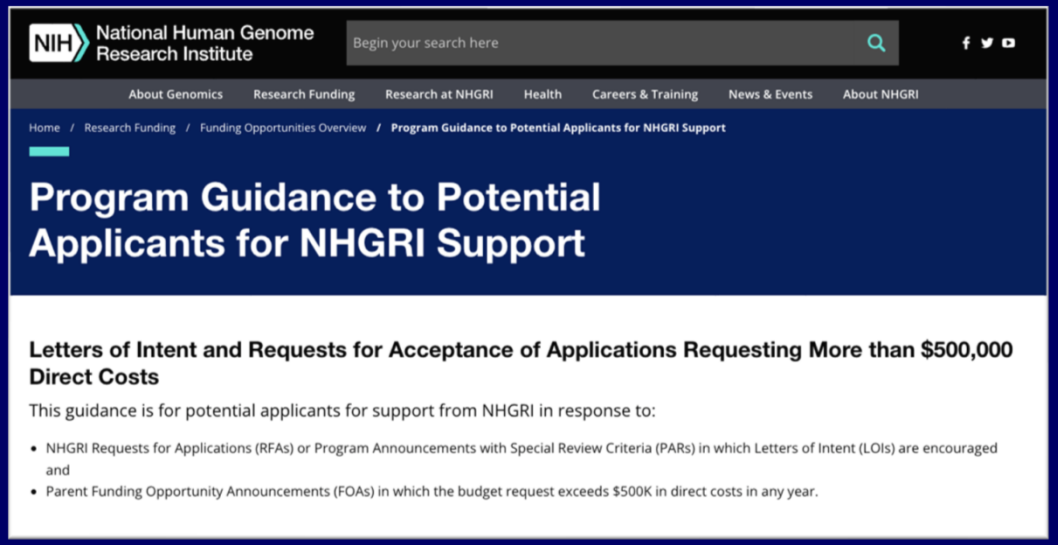
Influence of Genetic Information on Neonatologists' Decisions: A Psychological Experiment

Katharine Press Callahan, MD; John Flibotte, MD; Cara Skraban, MD; Katherine Taylor Wild, MD; Steven Joffe, MD, MPH; David Munson, MD; Chris Feudtner, MD, PhD, MPH

The evolution, evolvability and engineering of gene regulatory DNA

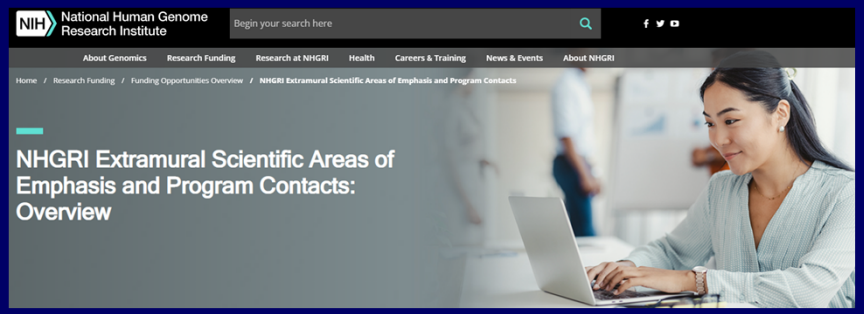
Eeshit Dhaval Vaishnav [#1,2], Carl G de Boer [#3,4], Jennifer Molinet [5,6], Moran Yassour [7,8,9], Lin Fan [10], Xian Adiconis [7,11], Dawn A Thompson [10], Joshua Z Levin [7,11], Francisco A Cubillos [5,6], Aviv Regev [12,13,14]

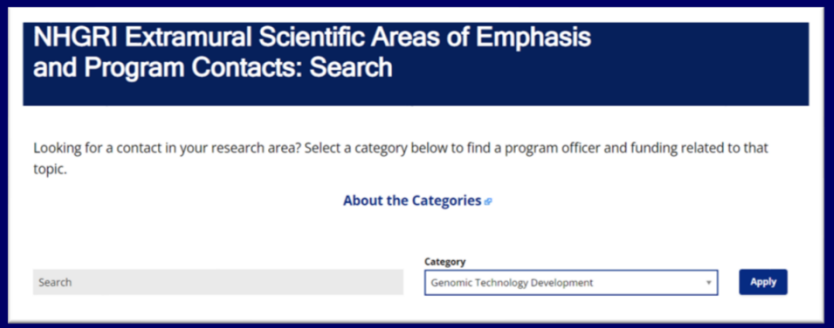
NHGRI Review of Requests for Applications with >$500K Direct Costs

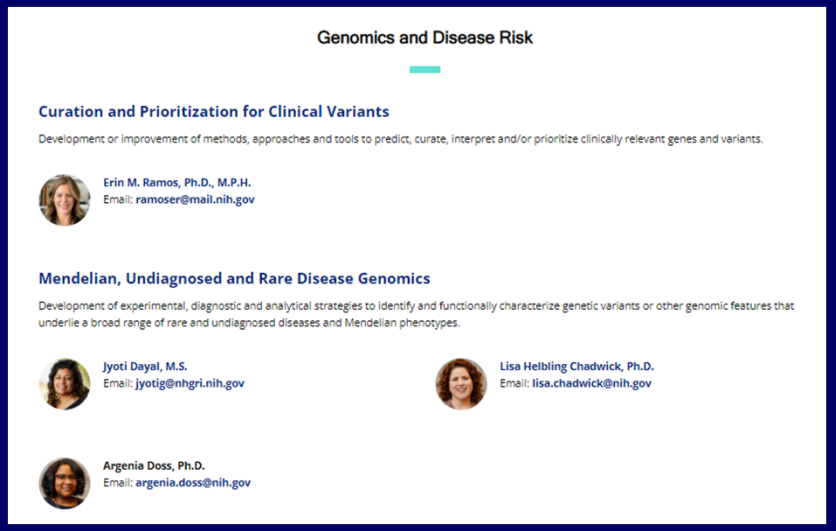


- Encourages requests be submitted at least eight weeks prior to anticipated submission date
- Details specific items to include in the request letter

Scientific Areas of Emphasis and Extramural Research Program Contacts Webpage







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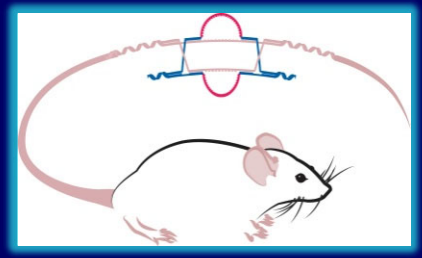
Knockout Mouse Phenotyping Project (KOMP2)



IMPC
International Mouse Phenotyping Consortium

- **Trans-NIH program supported by 18 institutes/centers**

  NCI, NEI, NHGRI, NHLBI, NIA, NIAAA, NIAID, NIAMS, NICHD, NIDA, NIDCD, NIDCR, NIDDK, NIEHS, NINDS, NCCIH, ORIP, & ORWH

- **Awards funded for a final five-year project period**

UCDAVIS

The Jackson Laboratory

Baylor College of Medicine

EMBL-EBI

Human Heredity & Health in Africa (H3Africa)

- >700 publications
- >50 in 2022

Perspective | Published: 10 February 2022

A roadmap to increase diversity in genomic studies

Segun Fatumo, Tinashe Chikowore, Ana Kuchenbaecker

Nature Medicine **28**, 243–250 (2022) | C

11k Accesses | **12** Citations | **487** Altm

> Pharmacogenet Genomics. 2022 Jul 1;32(5):173-182. doi: 10.1097/FPC.0000000000000467. Epub 2022 Feb 21.

Population genetic polymorphisms of pharmacogenes in Zim the safe and efficacious African ancestry

Brief Communication | Open Access | Published: 02 June 2022

Transferability of genetic risk scores in African populations

Abram B. Kamiza, Sounkou M. Toure, Marijana Vujkovic, Tafadzwa Machipisa, Opeyemi S. Soremekun, Christopher Kintu, Manuel Corpas, Fraser Pirie, Elizabeth Young, Dipender Gill, Manjinder S. Sandhu,

- Consortium meeting - Celebration of 10 Years
  - Session on African population descriptors

- ASHG Presidential Symposium on African Genomics

Harnessing Data Science for Health Discovery and Innovation in Africa (DS-I Africa)

DS-I Africa
Data Science for Health Discovery and Innovation in Africa

- **RFA-RM-22-023: Harnessing DS-I Africa: Partnership for Innovation Research Projects (U01) Due date: September 28, 2022**
- **RFA-RM-22-022: Harnessing DS-I Africa: Research Education Program (UE5) Due date: September 28, 2022**

Bridge to Artificial Intelligence (Bridge2AI)

Goals of Bridge2AI

- Use biomedical grand challenges to generate flagship AI-ready data sets
- Emphasize ethical AI best practices for biomedicine
- Promote diverse teams

Data Generation Project Awards (OT2):

Precision Public Health: Yael Bensoussan, USF

AI/ML in Clinical Care: Eric Rosenthal, Massachusetts General

Functional Genomics: Trey Ideker, UCSD

Salutogenesis: Aaron Lee, University of Washington

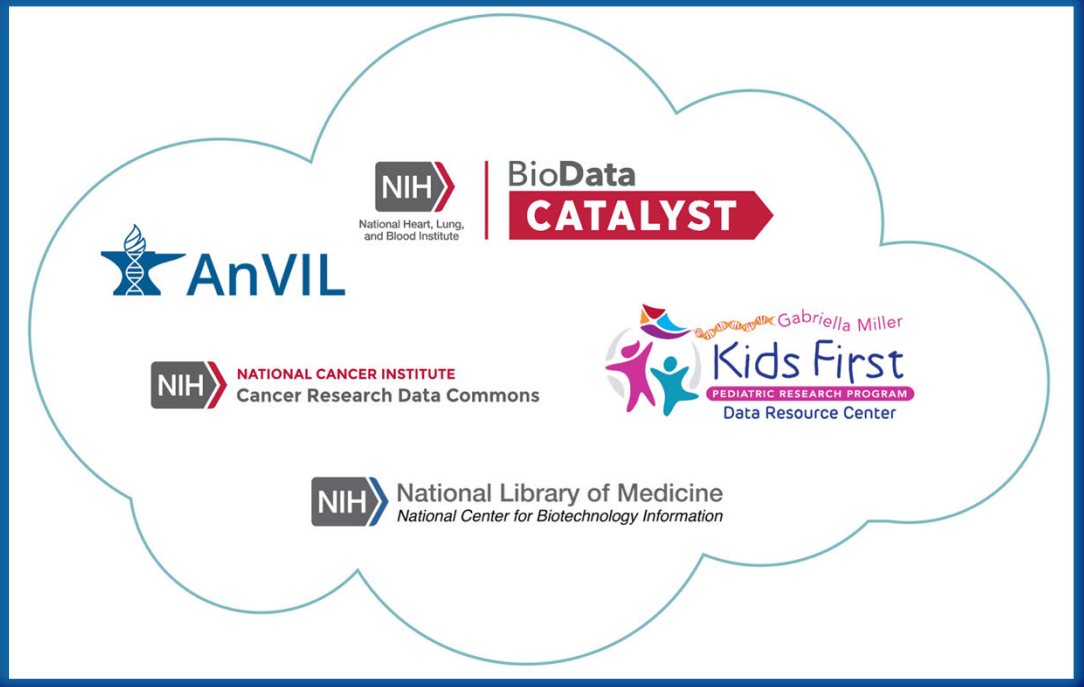
Bridge Center Awards (U54):

Administration/Ethics Cores: Lucila Ohno-Machado, UCSD

Tool Optimization and Skills/Workforce Dev. Cores: Alex Bui, UCLA

Teaming and Standards Cores: Monica Munoz-Torres, UC-Anschutz

NIH Cloud Platform Interoperability (NCPI)



- Establish a trans-NIH, cloud-based federated data ecosystem
- Coming soon: NCPI Administrative Coordination Center award funded by the NIH Office of Data Science Strategy

NIH Common Fund Office of Strategic Coordination

Office of Strategic Coordination

Douglas Sheeley, Sc.D.
Deputy Director

Re-engineering the Research Enterprise (RRE)

Cheryl Anne Boyce, Ph.D.
Assistant Director

Catalytic Data Resources (CDR)

Chris Kinsinger, Ph.D.
Assistant Director

Transformational Science and Discovery (TSD)

Ananda Roy, Ph.D.
Assistant Director

Document 36

Soliciting Ideas for New NIH Common Fund Programs

Request for Information: Soliciting ideas for new NIH Common Fund programs

Notice Number:
NOT-RM-22-016

Key Dates

Release Date:	July 20, 2022
Response Date:	September 30, 2022

Responses due: September 30, 2022

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Genomics and the Media

Magdalena Skipper
Editor in Chief, Nature;
Chief Editorial Advisor,
Nature Research

June 30, 2022

Conversations with trailblazing science communicators

Apoorva Mandavilli
Reporter (Science and Global Health), The New York Times

May 20, 2021

Dorothy Roberts
Professor of Law and Sociology, Civil Rights, University of Pennsylvania; Author, *Fatal Invention*

November 4, 2021

John Inglis
Executive Director, Cold Spring Harbor Laboratory Press; Co-founder, bioRxiv, medRxiv

July 28, 2021

Elizabeth Wayne
Assistant Professor of Chemistry, Carnegie Mellon University; Co-host, PhDivas Podcast

January 20, 2022

Amy Harmon
National Correspondant (Science and Society), The New York Times

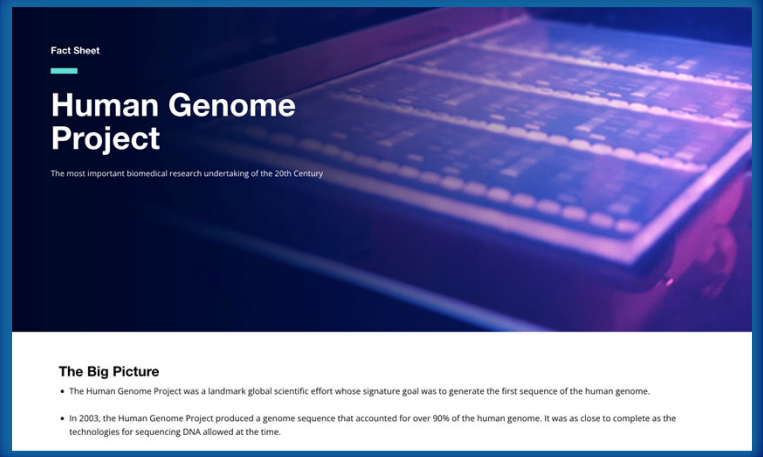
September 20, 2021

Joe Palca
Science Correspondent, NPR

March 8, 2022

NHGRI History of Genomics Program

10-Year Anniversary



- "The History of Genomics Told Through Machine Learning" lecture
- New Human Genome Project fact sheet
- Feature story
- Social media

Document 38

NHGRI History of Genomics Program

Future Events

- **Irreducible Subjects: Disability and Genomics in the Past, Present, and Future**
  October 6-7, 2022
- **The Promise and Perils of Social and Behavioral Genomics**
  January 2023

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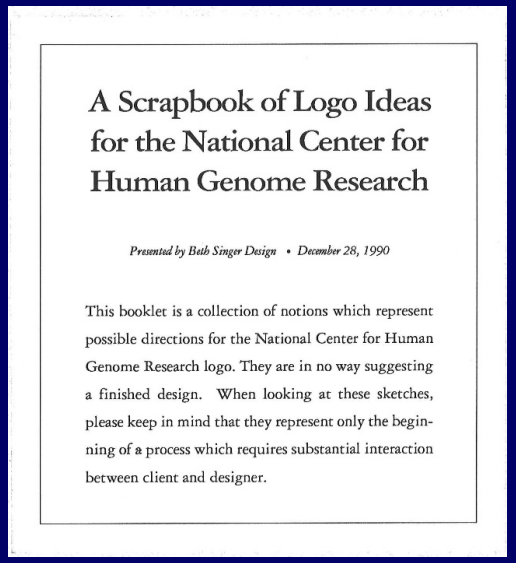
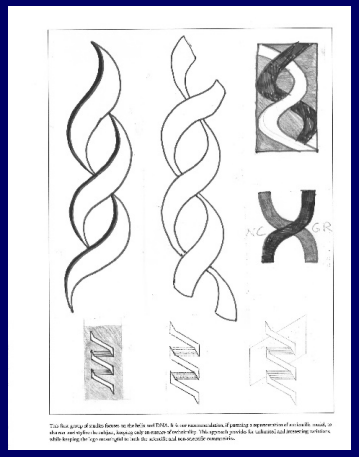
NHGRI History of Genomics Program

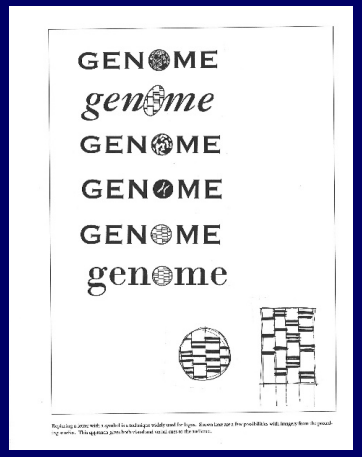
Archival Highlight

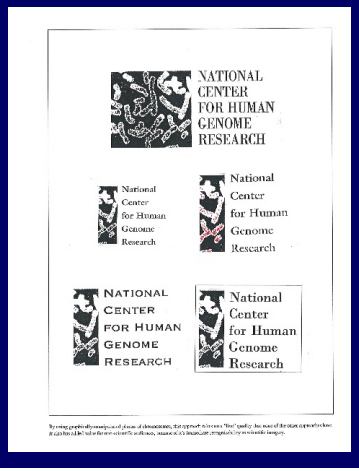

A Scrapbook of Logo Ideas for the National Center for Human Genome Research

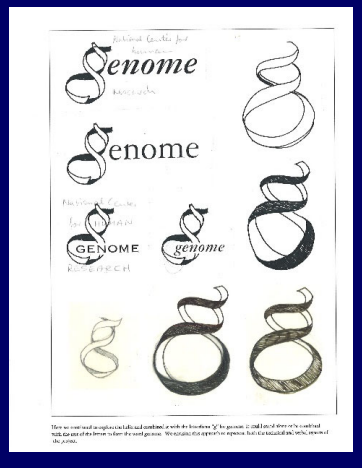
Presented by Beth Singer Design • December 28, 1990

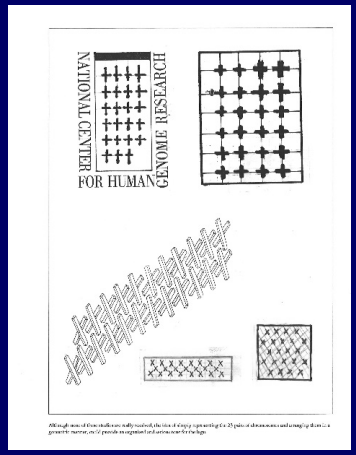
This booklet is a collection of notions which represent possible directions for the National Center for Human Genome Research logo. They are in no way suggesting a finished design. When looking at these sketches, please keep in mind that they represent only the beginning of a process which requires substantial interaction between client and designer.



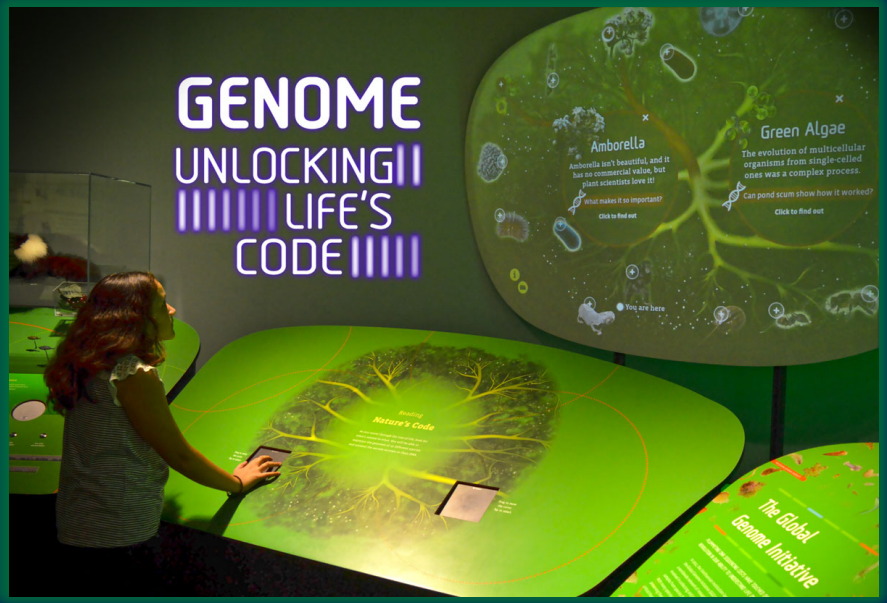








2022 Virtual Short Course in Genomics



NHGRI Genomic Education Resources (GenomeEd)

G2C2

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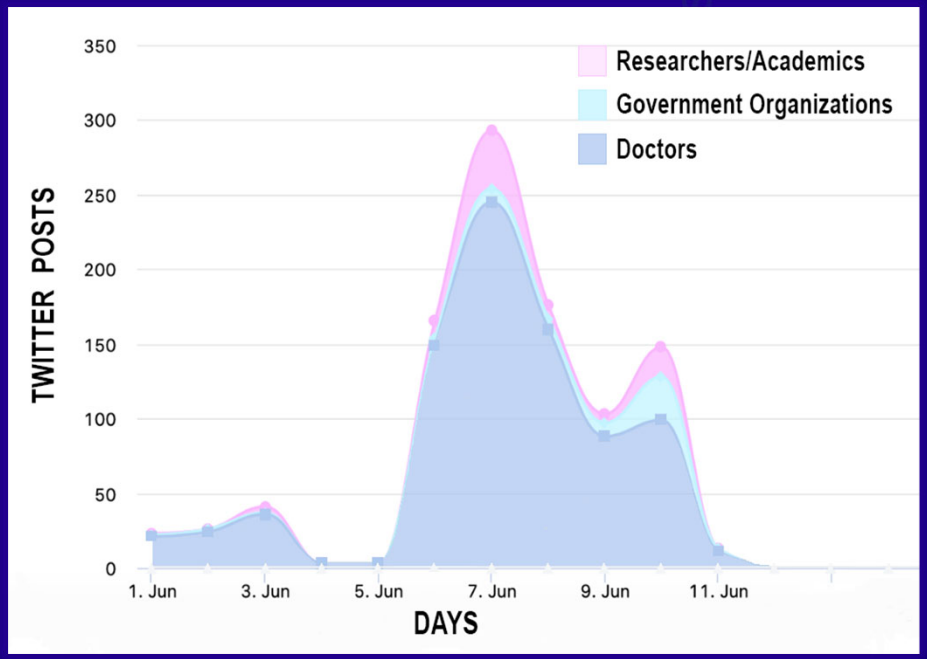
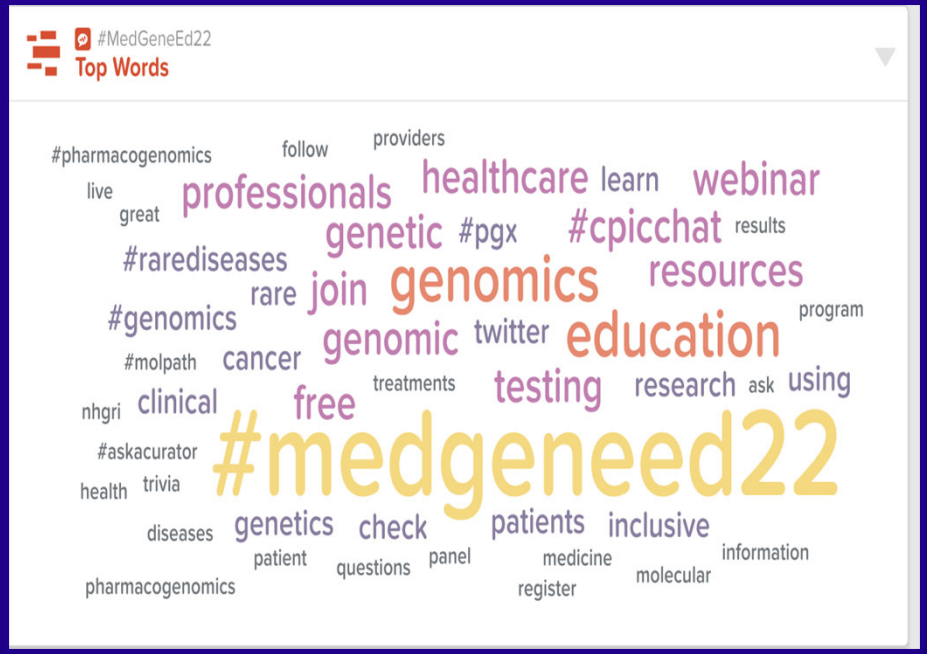
GenomeEd

Healthcare Professionals' Genomics Education Week

Social Media Campaign 2022





Director's Report Outline

I. General NHGRI Updates

II. General NIH Updates

III. General Genomics Updates

IV. NHGRI Extramural Research Program

V. NIH Common Fund/Trans-NIH

VI. NHGRI Communications, Policy, and Education

VII. NHGRI Intramural Research Program

New Member, American Philosophical Society

Francis Collins, M.D., Ph.D.

AMERICAN PHILOSOPHICAL SOCIETY

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NHGRI Intramural Research Highlights

PLOS GENETICS

Patagonian sheepdog: Genomic analyses trace the footprints of extinct UK herding dogs to South America

Science Translational Medicine

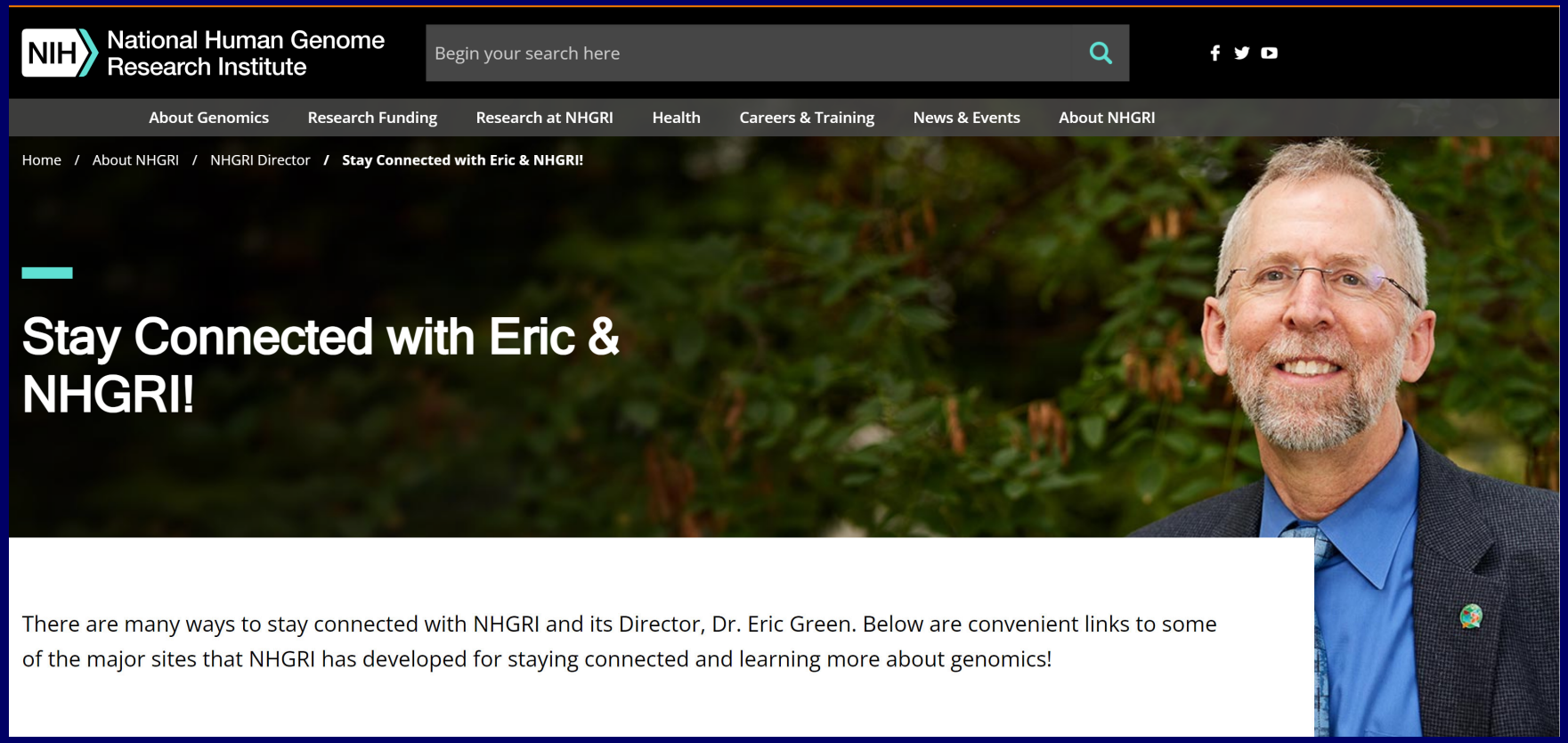
Aberrant methylmalonylation underlies methylmalonic acidemia and is attenuated by an engineered sirtuin

scientific reports

Whole-genome sequencing reveals de-novo mutations associated with nonsyndromic cleft lip/palate

‘One-Stop-Shop’ to Stay Connected

genome.gov/stayconnected



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National Human Genome Research Institute

Thanks!

Special Thanks!


The Forefront
of Genomics®