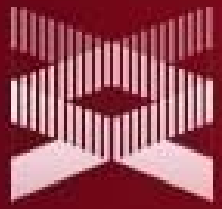


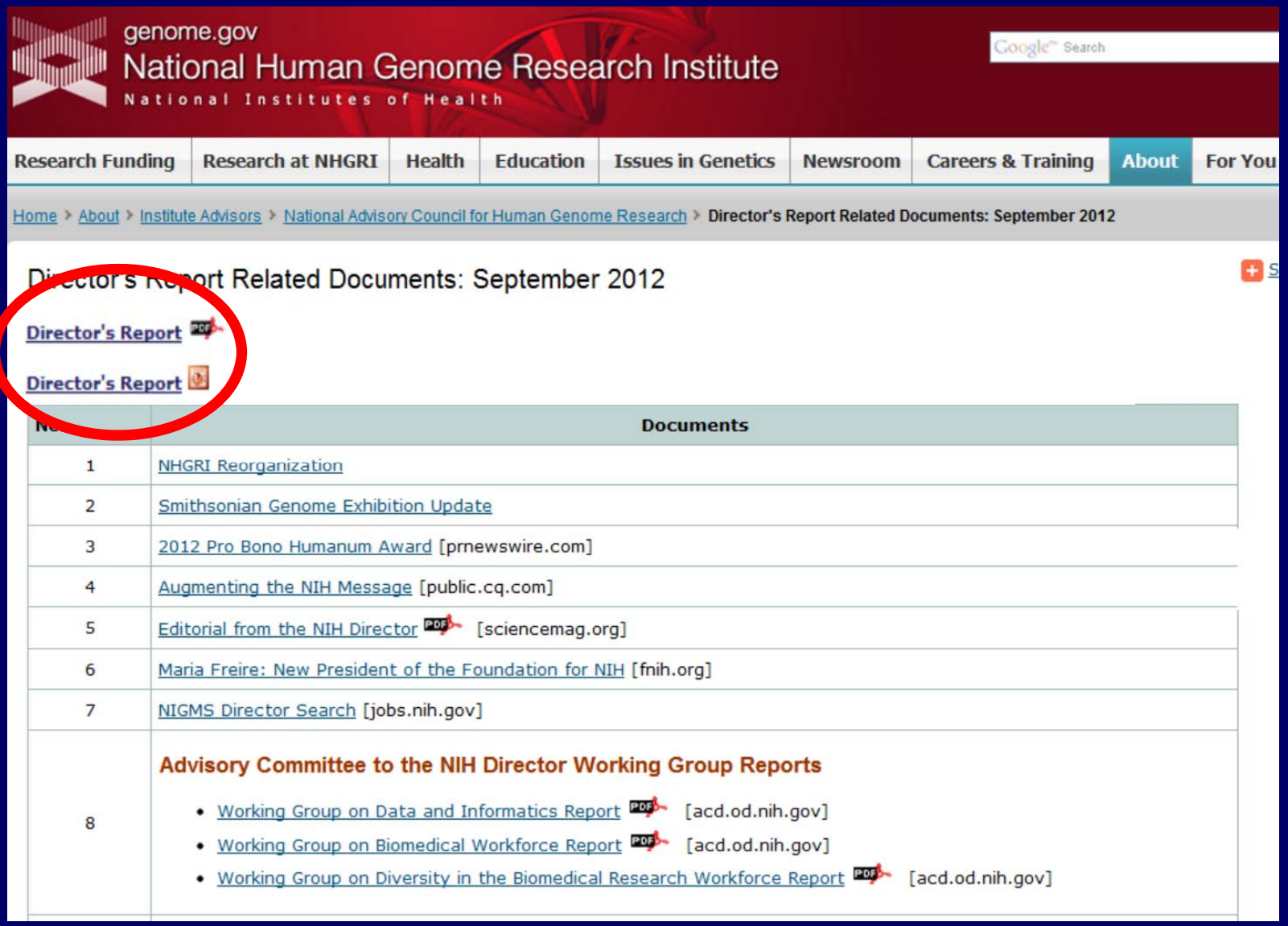
genome.gov
National Human Genome Research Institute
National Institutes of Health

DIRECTOR'S REPORT

National Advisory Council for Human Genome Research

September 2012

Eric Green, M.D., Ph.D.
Director, NHGRI



genome.gov/DirectorsReport

Document #

Open Session Presentations

- **Genomic Medicine Working Group Update**
  - **Rex Chisholm and Teri Manolio**
- **Meeting Reports:**
  1. **Workshop on "Establishing a Central Resource of Data from Genome Sequencing Projects"**
     - **Lisa Brooks**
  2. **Workshop on "Sequencing in Cohort Studies and Large Sample Collections"**
     - **Teri Manolio**
  3. **Workshop on "Integrating Functional Data for Connecting Genotype to Phenotype"**
     - **Adam Felsenfeld**

Open Session Presentations

- **Project Update: GWAS Catalog**
  - **Lucia Hindorff**
- **NHGRI and the NIH Common Fund**
  - **Mark Guyer**
- **Concept Clearance: "Family History Implementation in the Challenging Setting of Routine Clinical Care"**
  - **Anastasia Wise**

Open Session Presentations

NHGRI Intramural Research Program:

- **Update from the NHGRI Scientific Director**
  - **Dan Kastner**
- **Report from the Blue Ribbon Panel Review**
  - **Rick Myers and David Page**

I. General NHGRI Updates

II. General NIH Updates

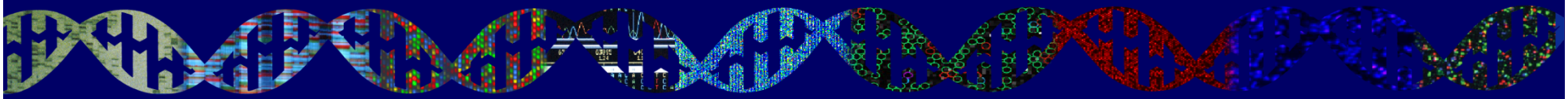
III. Genomics Updates

IV. NHGRI Extramural Program

V. NIH Common Fund Programs

VI. NHGRI Office of the Director

VII. NHGRI Intramural Program



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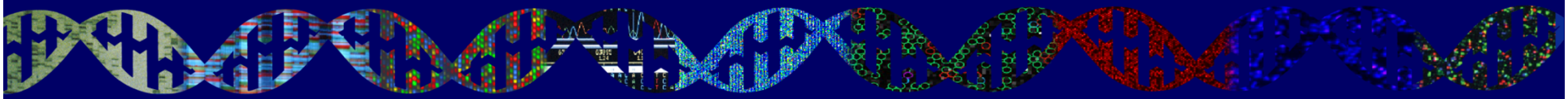


NHGRI Reorganization

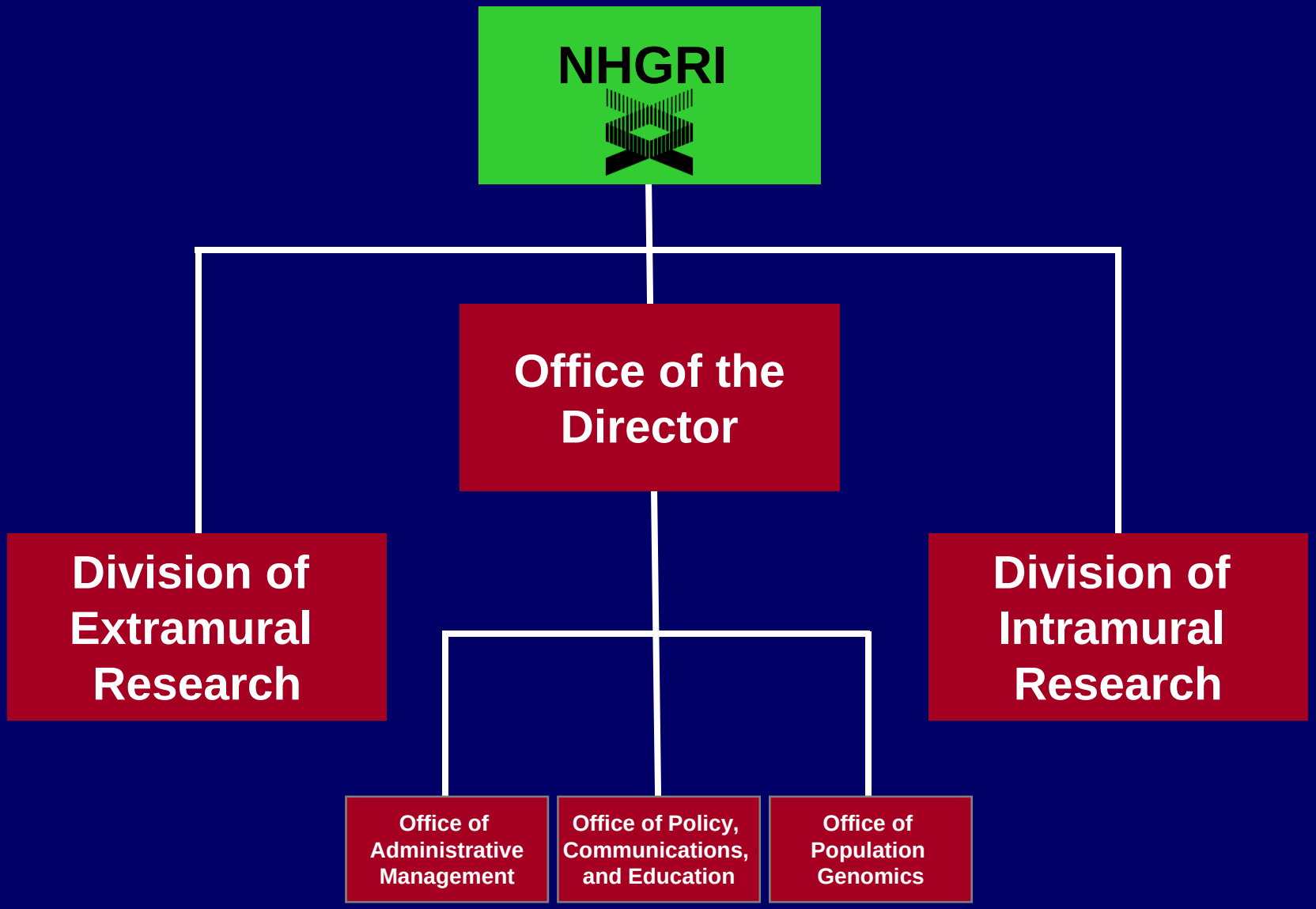
Announcing Today:

Proposed reorganization of NHGRI has been approved and will be implemented on October 1, 2012

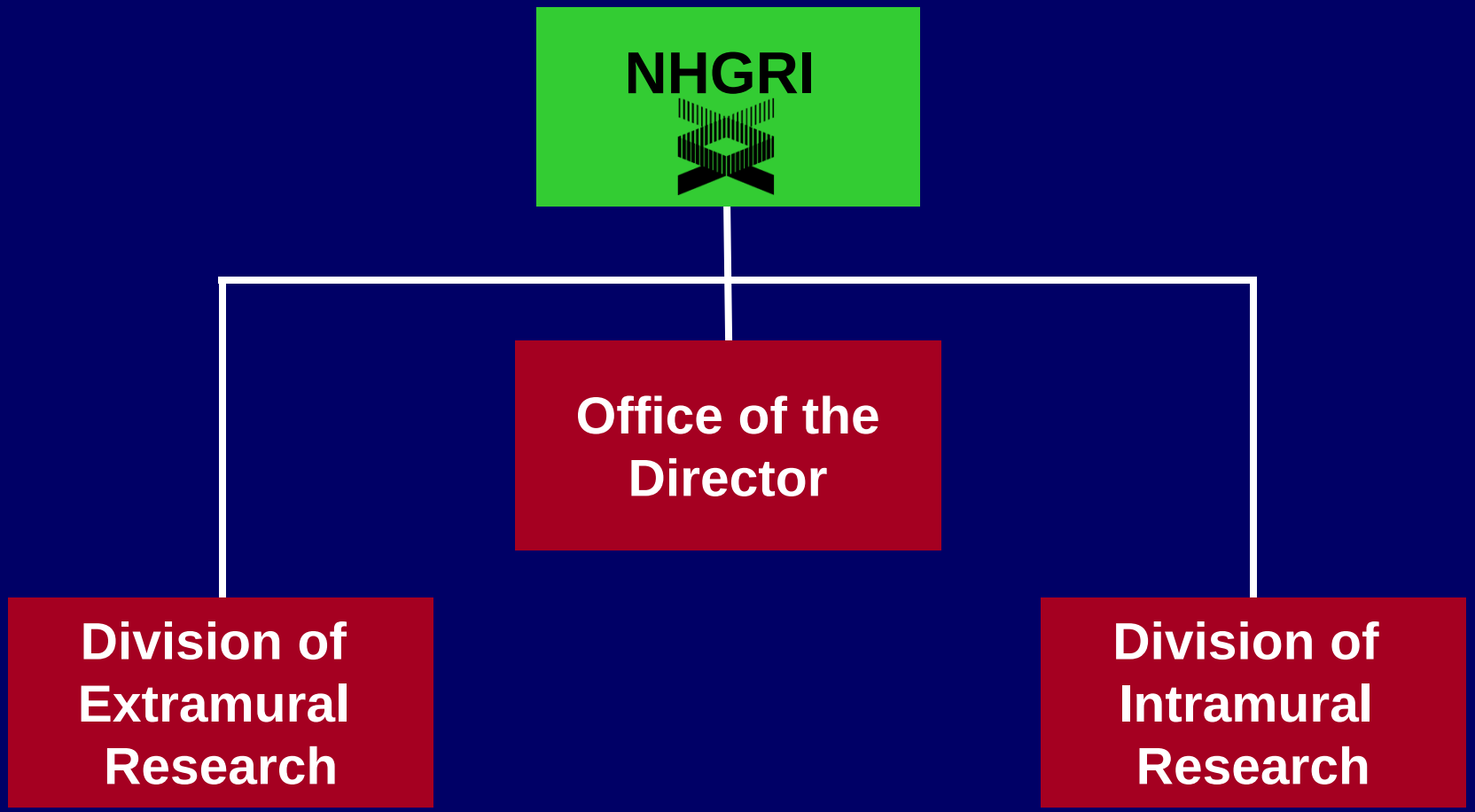
See genome.gov/reorg

Document 1

Current NHGRI Organizational Structure



Current NHGRI Organizational Structure

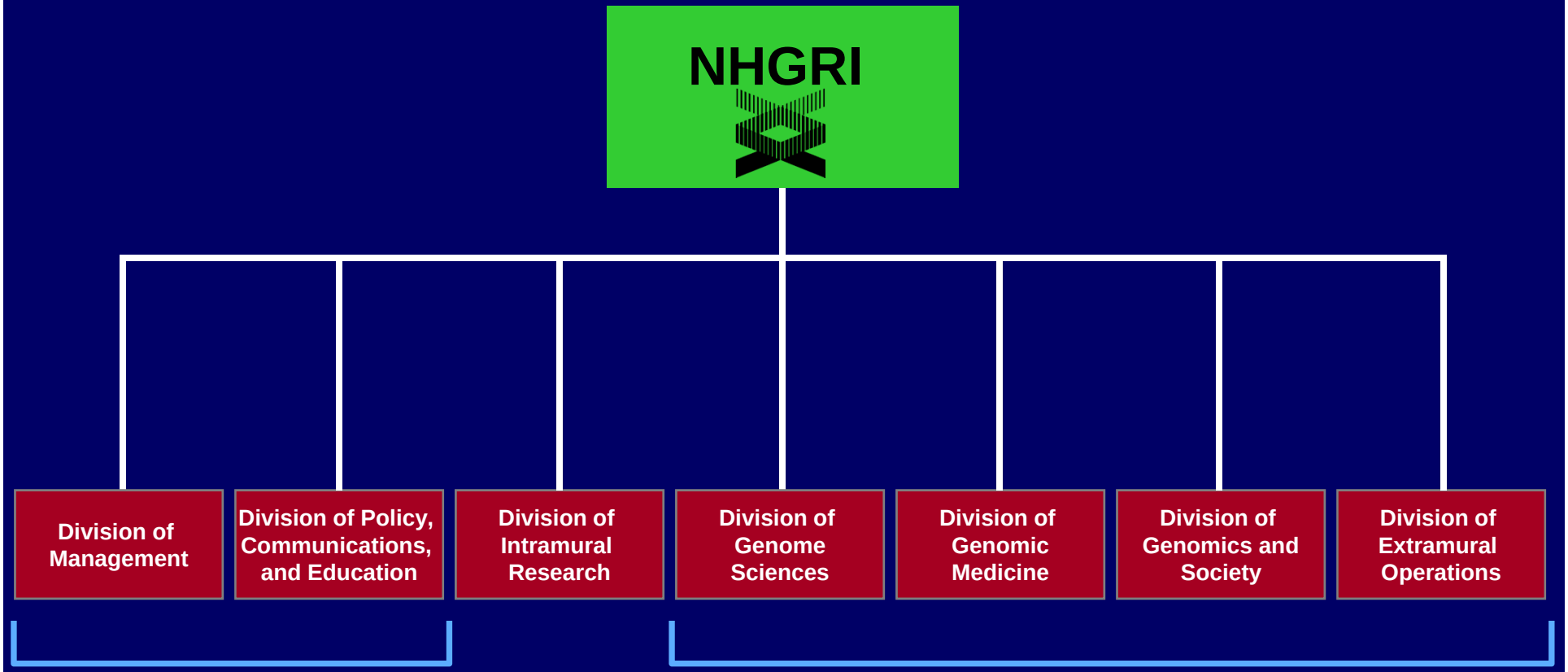


Major Changes

Minor Changes

No Changes

New NHGRI Organizational Structure



Steps to NHGRI Reorganization

- Followed guidance in NIH Reform Act of 2006
- Two public meetings:

  Webinar on Jan. 18, 2012

  NACHGR Meeting on Feb. 13, 2012
- Reorganization package submitted: February, 2012
- Final approval: June, 2012
- Announcement of reorganization: Sept. 10, 2012
- Implementation of reorganization: Oct. 1, 2012

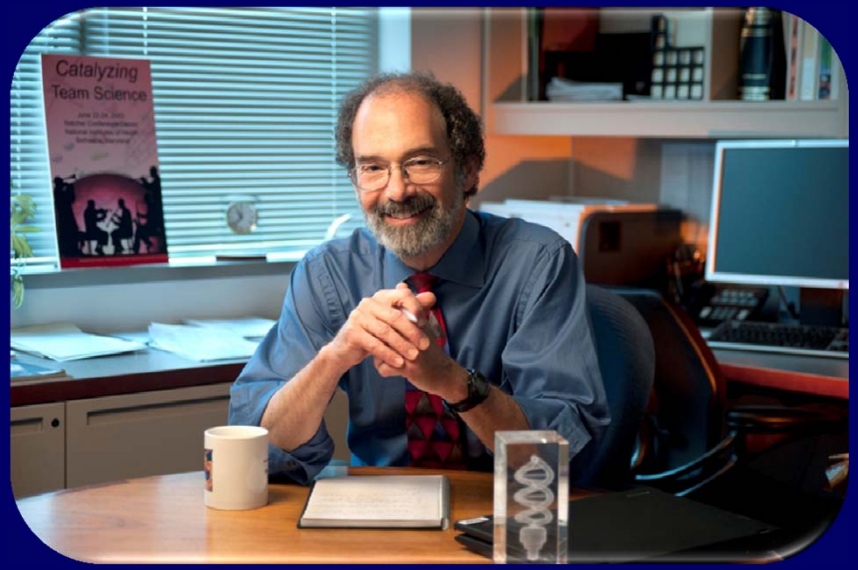
Division Leadership

Janis Mullaney, B.S., M.B.A.
Director
Division of Management

Laura Lyman Rodriguez, Ph.D.
Director
Division of Policy, Communications, and Education

Dan Kastner, M.D., Ph.D.
Director
Division of Intramural Research

Leadership: Division of Genome Sciences



Jeff Schloss, Ph.D.
Director

Peter Good, Ph.D.
Deputy Director

Leadership: Division of Genomic Medicine

Teri Manolio, M.D., Ph.D.
Director

Brad Ozenberger, Ph.D.
Deputy Director

Leadership: Division of Extramural Operations

Bettie Graham, Ph.D.
Director

Rudy Pozzatti, Ph.D.
Deputy Director

Leadership: Division of Genomics and Society

Mark Guyer, Ph.D.
Acting Director

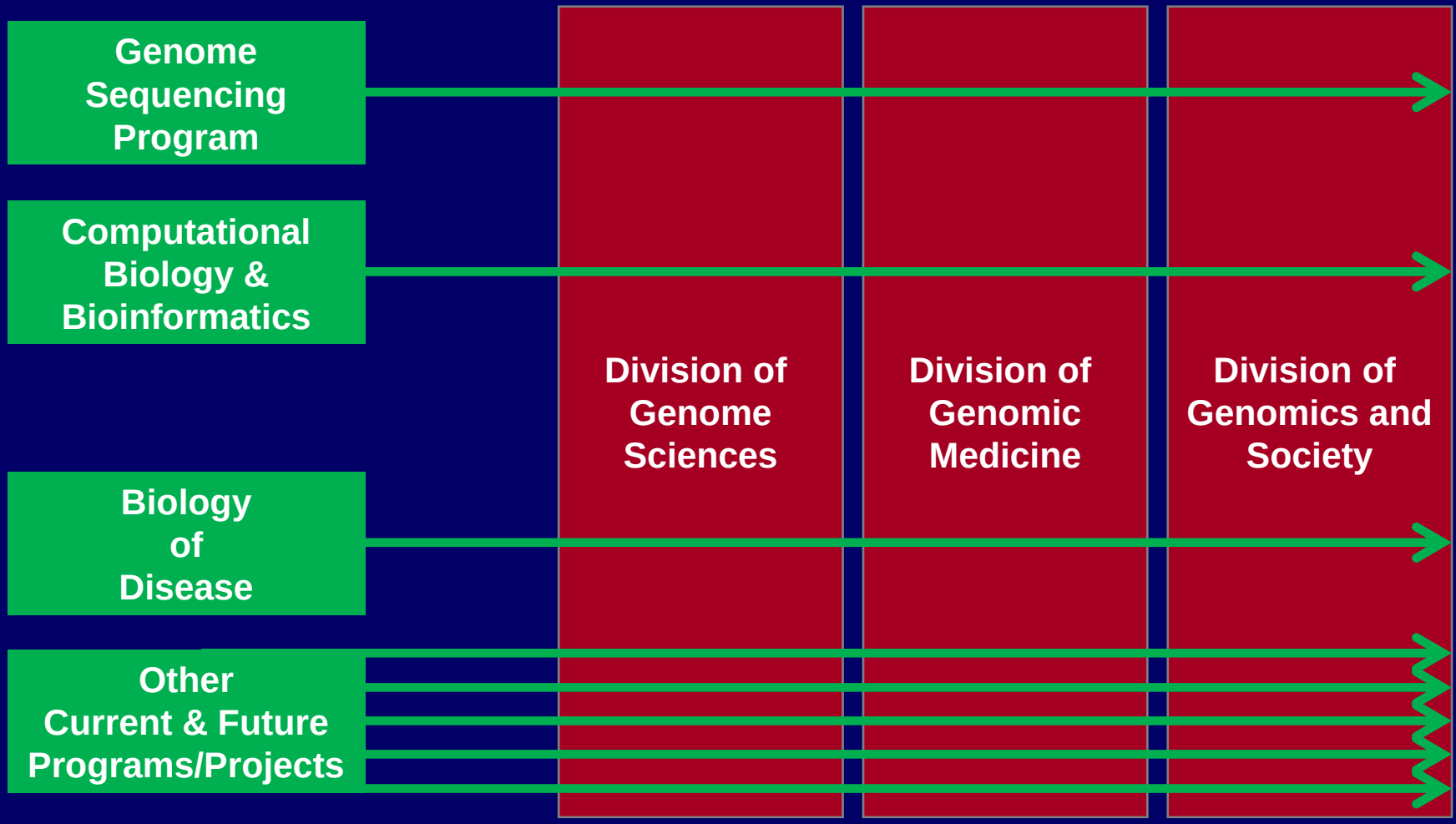
Senior Advisor Appointments

Jane Peterson, Ph.D.
Senior Advisor to the
NHGRI Office of the Director

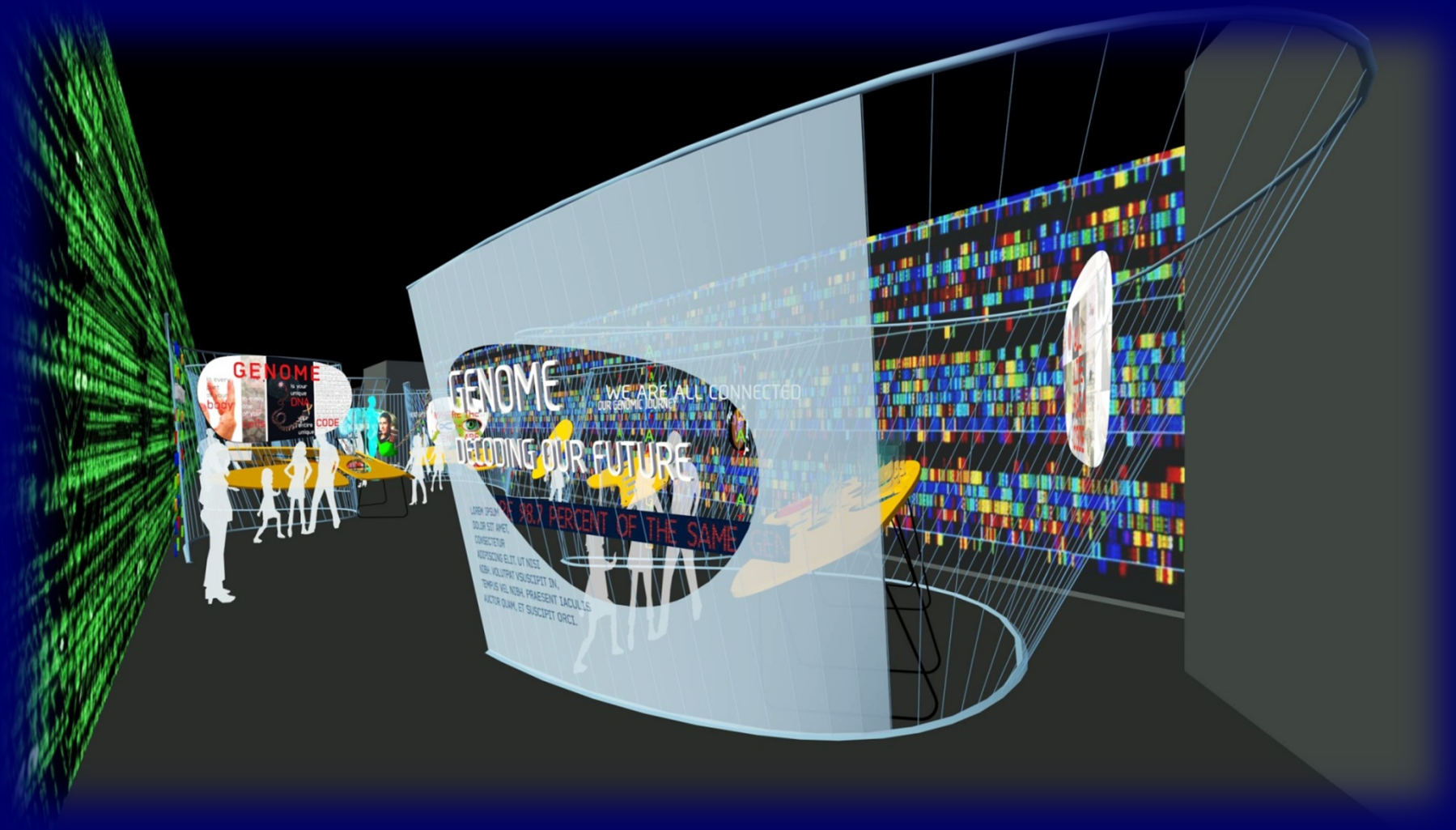
Vence Bonham, J.D.
Senior Advisor to the
NHGRI Director on
Genomics and Health Disparities

Karen Rothenberg, J.D., M.P.A.
Senior Advisor to the
NHGRI Director on
Genomics and Society

Program/Project Oversight and Execution



Smithsonian Genome Exhibition Update



Document 2

NHGRI Staff Retirement

Elizabeth Thomson, DNSc, RN, CGC, FAAN

New ASHG/NHGRI Policy Fellow

Laura Koontz, Ph.D.

Eric Green ‘Down Under’

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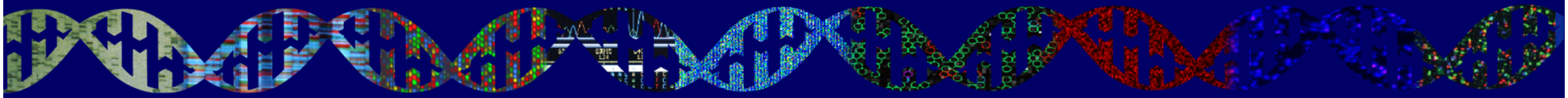


2012 Pro Bono Humanum Award

PRIX GALIEN USA
NEW YORK 2012
OCTOBER 16TH, 2012

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

Document 3

Augmenting the NIH Message

"Increasingly, he's describing NIH not just as a powerful force in the war against disease… but also an incubator of new jobs and new products"

Document 4

Editorial from the NIH Director

Francis S. Collins is director of the U.S.

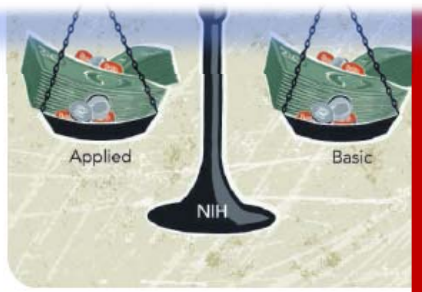
EDITORIAL

NIH Basics

"WHEN EVERYBODY GETS TO ONE SIDE OF THE BOAT, IT USUALLY TIPS OVER." THAT SAYING MAY have originated on Wall Street, but it also stands as a warning to those charting the future of

"Americans need to know that today's basic research is the engine that powers tomorrow's therapeutic discoveries."

accounts for most of the 135 Nobel Prizes won by NIH-supported scientists, including the 2011 awards to Bruce Beutler and Jules Hoffmann for their discoveries about innate immunity, and the late Ralph Steinman for adaptive immunity. Likewise, current NIH grantee Arthur Horwich and past grantee F. Ulrich Hartl captured 2011 Lasker awards for landmark explorations of the cell's protein-folding machinery. Their work, which provided insights on protein misfolding in neurodegenerative disease, is among countless examples of basic research, including that with model organisms,* giving rise to medical advances.



Document 5

New President of the Foundation for NIH

Maria Freire, Ph.D.

Document 6

New Director of the NIH Office of Research on Women's Health (ORWH)

Janine Clayton, M.D.

NIGMS Director Search

NIGMS Feedback Loop Blog

A catalyst for interaction with the scientific community

Search for NIGMS Director Resumes

Posted by **Story Landis** on **Wednesday, Aug 1, 2012 11:10 AM EDT**
Post a Comment | View Comments (7)

The search for the next director of NIGMS has officially restarted. If you want to play a leading role in shaping the future of biomedical research, see the just-issued vacancy announcement for details on how to apply. If you know of others who might be interested in this position, please share this information with them.

The NIGMS director is the Institute's "chief visionary," setting goals, priorities and policies. He or she oversees a budget of $2.4 billion, which funds basic research in cell biology, biophysics, genetics, developmental biology, pharmacology, physiology, biological chemistry, biomedical technology, bioinformatics, computational biology, and selected behavioral and clinical areas. NIGMS also supports a significant amount of research training and has programs designed to develop and increase the diversity of the biomedical and behavioral research workforce.

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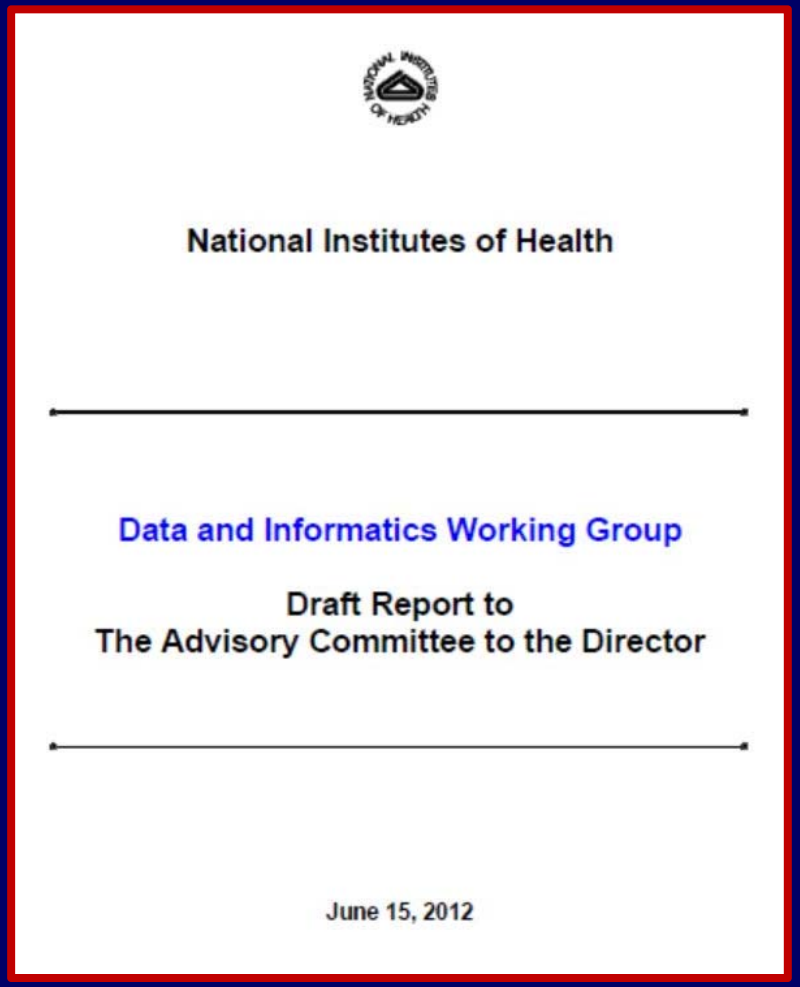
- Contributors
- Comment Policy
- Other Policies
- NIGMS Web Site

Document 7

Data and Informatics Working Group



National Institutes of Health

Data and Informatics Working Group

Draft Report to
The Advisory Committee to the Director

June 15, 2012

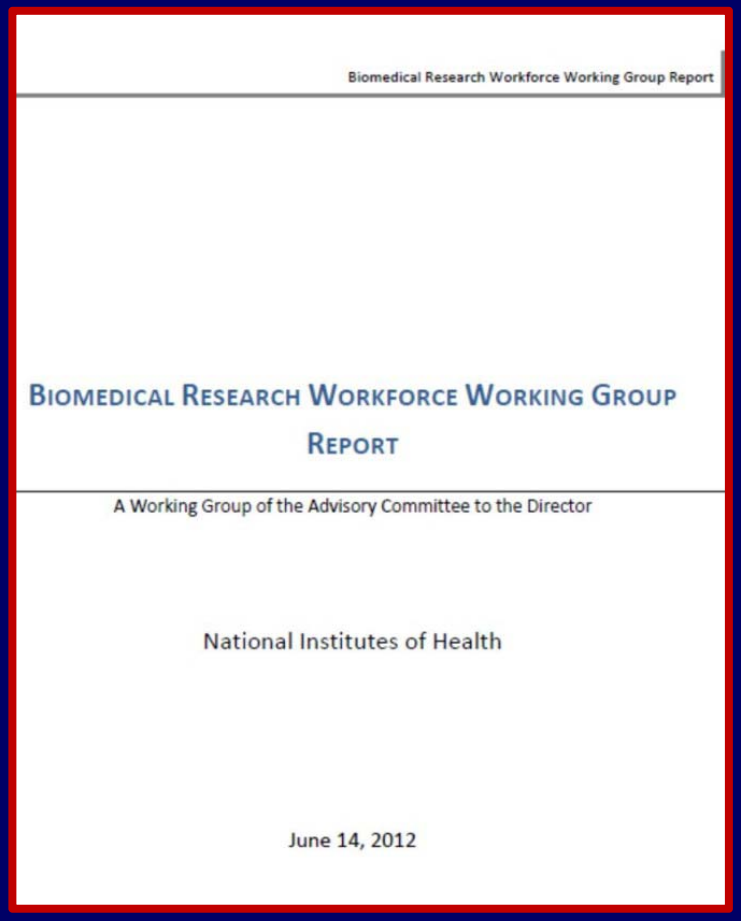
ADVISORY COMMITTEE TO THE DIRECTOR

Advisory Committee to the Director

Working Group on Data and Informatics

Document 8

Biomedical Research Workforce Working Group

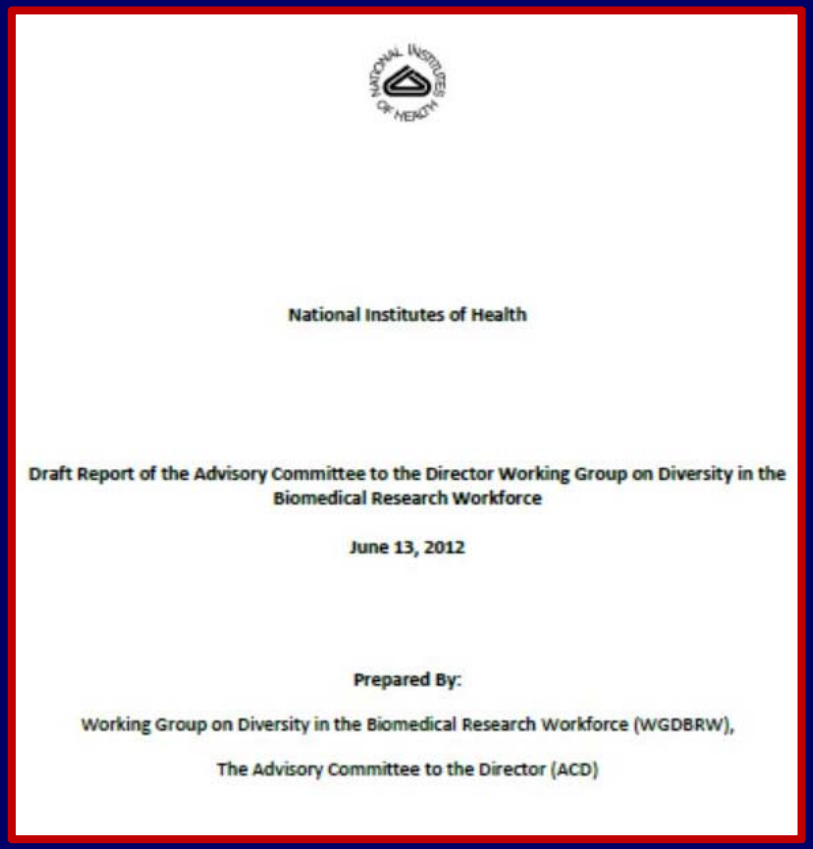


ADVISORY COMMITTEE TO THE DIRECTOR

Advisory Committee to the Director — Biomedical Workforce Task Force

Document 8

Working Group on Diversity in the Biomedical Research Workforce



National Institutes of Health

Draft Report of the Advisory Committee to the Director Working Group on Diversity in the Biomedical Research Workforce

June 13, 2012

Prepared By:

Working Group on Diversity in the Biomedical Research Workforce (WGDBRW),

The Advisory Committee to the Director (ACD)

Document 8

Courts Give NIH hESC Funding the ‘All Clear’

Drs. Sherley and Deisher

Secretary Sebelius

Document 9

NIH Fiscal Year 2013 Appropriation

- Continuing Resolution (CR) agreement will keep the government running through March
- Regular appropriations process will not be completed until the next Congress

	Actual FY2012	President FY2013	House FY2013	Senate FY2013
NIH	$30.7 B	$30.7 B	$30.6 B	$30.7 B
NHGRI	$513 M	$511 M (-0.29%)	$512 M	$513 M

House Energy & Commerce Subcommittee on Health: NIH Oversight Hearing

- Hearing entitled "*The National Institutes of Health - A Review of Its Reforms, Priorities, and Progress*"
- Reviewed the implementation of the 2006 NIH Reform Act, progress of NCATS, and the determination of NIH funding and research priorities

Document 10

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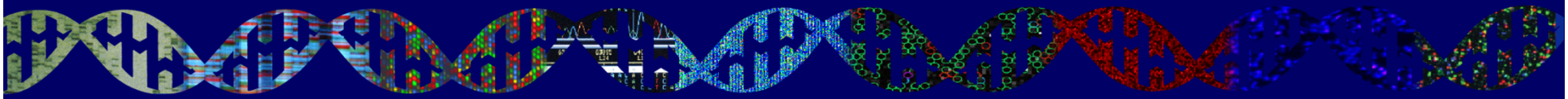


2012 Lemelson-MIT Prize

LEMELSON-MIT
Celebrating innovation, inspiring youth

Steve Quake, D.Phil.

Document 11

Amy McGuire Named Center Director

Amy McGuire, J.D., Ph.D.

Document 12

Joann Boughman Leaving ASHG

Joann Boughman, Ph.D.

Document 13

Presidential Commission for the Study of Bioethical Issues

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Meeting of the Presidential Commission for the Study of Bioethical Issues

AGENCY: Department of Health and Human Services, Office of the Assistant Secretary for Health, Presidential Commission for the Study of Bioethical Issues.

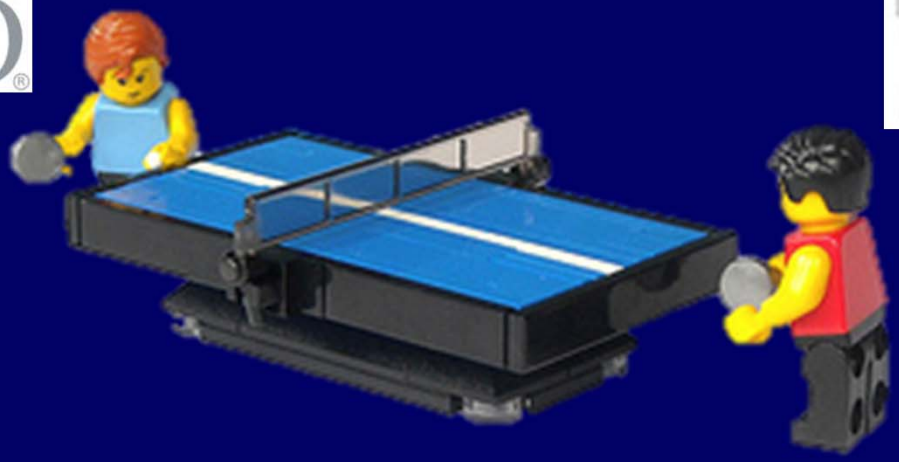
ACTION: Notice of meeting.

SUMMARY: The Presidential Commission for the Study of Bioethical Issues will conduct its tenth meeting in August. At

Document 14

Biotech Patents and the Courts

MYRIAD



Document 15

NHGRI Genome Advance of the Month

Uncovering the Archeological Landscape of Cancer Genomes

By Roseanne F. Zhao, Ph.D.
Intramural Fellow

Researchers view DNA through 3D lens

By Andrea H. Ramirez, M.D., M.S.
Clinical Fellow, NHGRI

The Human Microbiome Project: Extending the definition of what constitutes a human

By Joy Yang
Post-baccalaureate Fellow

A Genetic Fountain of Youth?

By Danielle Daee, Ph.D.
Intramural Postdoctoral Fellow, NHGRI

As we age our hair turns gray, our skin wrinkles and our muscles lose their tone. Some turn to surgical remedies to combat these less-than-glamorous side effects of aging. Beyond surgical reversal, scientists have worked diligently to understand the fundamental mechanisms of aging, knowing that a clearer understanding may reveal ways to slow the aging process.

Genetically speaking, a person remains virtually unchanged through the course of his or her life. In contrast, a person's physical appearance changes dramatically throughout the years. If a person's genes are largely unchanged, what accounts for these striking physical differences?

This month's Genome Advance of the Month compares newborns and centenarians to see if epigenetic changes, or alterations in the signals on the genes rather than the genes themselves, could be associated with aging.

There are thousands of genes in the human genome, but by turning on and off a specific combination of genes, a cell can develop into a heart, skin, or the other diverse tissues of the human body. To allow the right combination of genes to be expressed for a particular cell, proteins mark genes with flags, or epigenetic changes, that tell the cell to turn the gene on or off. One type of flag, methylation, occurs in large repetitive "CG" sequences called CpG islands.

Document 16

Genomics in the News…

Science on NBCNEWS.com

A smart bunch of scientists unpeel banana's genome

Achievement opens way for a better fruit more resistant to parasites and other stresses

NewScientist Health

Exome sequencing gets to the root of rare diseases

nature International weekly journal of science

Genome study highlights risk factor for multiple sclerosis

Discovery of genetic variant could help to improve clinical trials of potential therapies.

Document 17

Genomics in the News…

The New York Times

The New York Times

Health

Genetic Gamble

New Approaches to Fighting Cancer

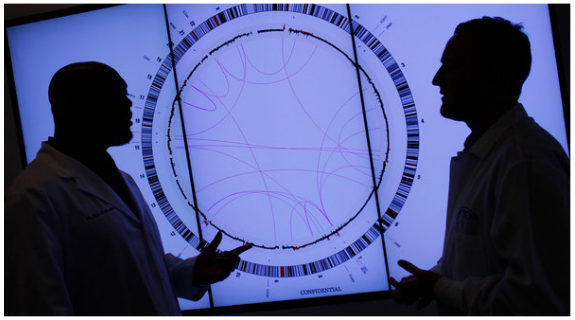
PART ONE
A Race to Leukemia's Source

PART TWO
Promise and Heartbreak

PART THREE
What a Tumor Holds in Store

In Treatment for Leukemia, Glimpses of the Future

A New Treatment's Tantalizing Promise Brings Heartbreaking Ups and Downs



A Life-Death Predictor Adds to a Cancer's Strain

Document 17

Genomics in the News…

The New York Times

The New York Times

Research

By CARL ZIMMER
Published: August 21, 2012

People have been searching for new medicines for thousands of years, and yet we have barely explored the universe of possibilities. Recently chemists at the University of Bern in Switzerland tried to estimate how many promising molecules have yet to be tested. In June they published their best guess: over a million billion billion billion billion billion billion. Blindly testing those molecules one at a time is not practical, and most of them will turn out to be useless anyway. So many scientists are looking for strategies they can use to zero in more quickly on promising candidates.

At the University of Texas at Austin, a team of biologists is speeding the search by exploring our evolutionary history. They are finding surprising links between the biology of humans and that of our most distant relatives — links that point the way to new drugs.

Document 17

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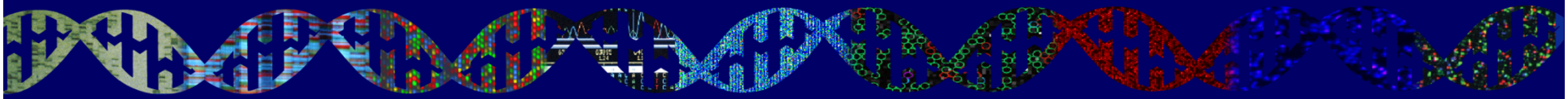


NHGRI Genome Sequencing Program

- Large-Scale Genome Sequencing and Analysis Centers
- Centers for Mendelian Genomics
- Clinical Sequencing Exploratory Research Projects
- Informatics Tools for High-Throughput Sequence Data Analysis

- Meeting involving all components: October 2012

Large-Scale Genome Sequencing and Analysis Centers

- Alzheimer's disease genome sequencing project in late planning stages
- Most recent quarter: 57 Tb produced
- Papers published or in press:

Cancer	Microbiome
Autism	Clinical
Rare diseases	Methods/Reference

- Ongoing projects: cancer, complex disease, rare diseases and comparative sequencing

TCGA Papers:

- **Colorectal Carcinoma**
  ***Nature* 487:330-337, 2012**


ARTICLE

doi:10.1038/nature11252

Comprehensive molecular characterization of human colon and rectal cancer

The Cancer Genome Atlas Network*

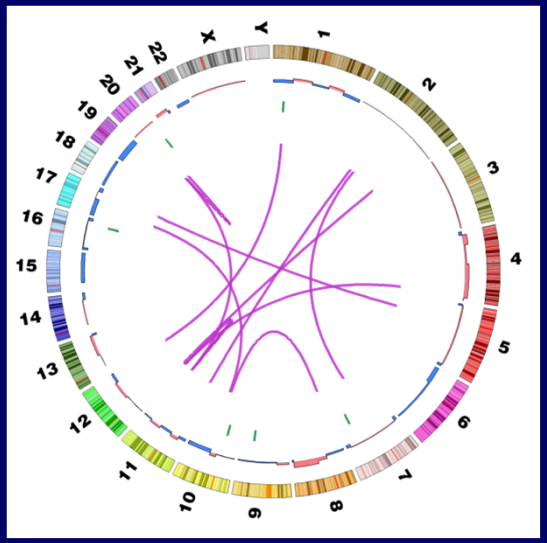
- **Lung Squamous Cell Carcinoma**
  ***Nature,* published on-line (September 9, 2012)**
- **Breast Carcinoma (in press)**
- **Kidney Clear Cell Carcinoma (in preparation)**
- **Acute Myeloid Leukemia (in preparation)**

Document 19

2nd Annual TCGA Scientific Symposium

November 27-28, 2012

Crystal City, VA

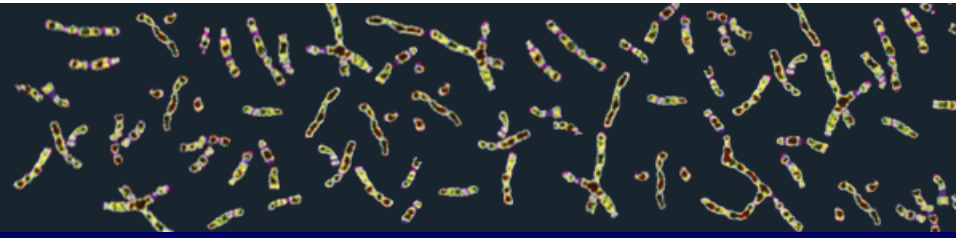


Co-Chairs: Matthew Meyerson & Ilya Shmulevich

Document 19

1000 Genomes

A Deep Catalog of Human Genetic Variation



- **Now working on methods development**
- **All 2500 samples (25 populations) should be sequenced by December and analyzed next year**
- **The Phase 1 paper on variation in 1092 samples (14 populations) will be published by November**

- **>100 Mendelian diseases selected; sequencing ongoing**
- **A number of disease genes identified**
- ***AJMG* Commentary:**

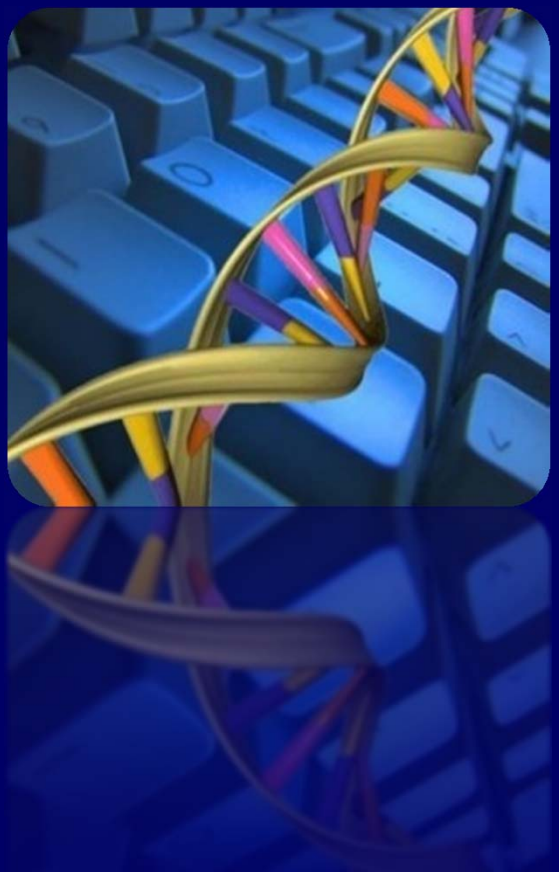
  The Centers for Mendelian Genomics: a new large-scale initiative to identify the genes underlying rare Mendelian conditions. *Am J Med Genet* (2012)
- **Joint sample solicitation group now receiving samples**
- **Educational program on Mendelian genomics at 2012 ASHG Meeting**

Clinical Sequencing Exploratory Research (CSER) Projects

- Strong response to the reissued RFA (HG-12-009)
- Applications to be discussed at the February Council meeting
- NCI and NIDA have tentatively agreed to support awards relevant to their missions
- Also received applications for a Coordination Center

Document 22

Informatics ‘iSeqTools’ Network



NHGRI awards funding to develop tools for genome sequence analyses

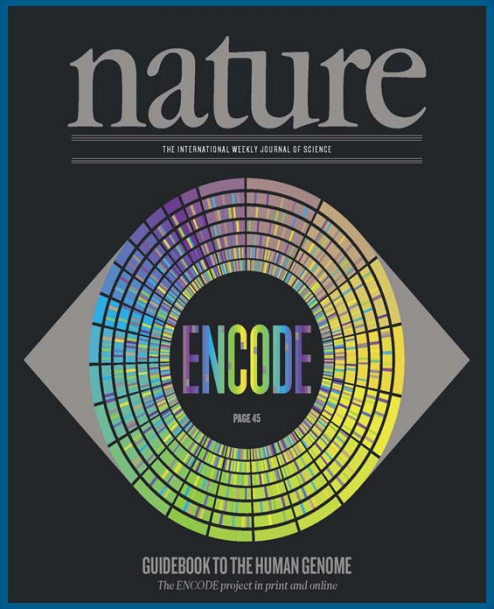
Comments Share Print

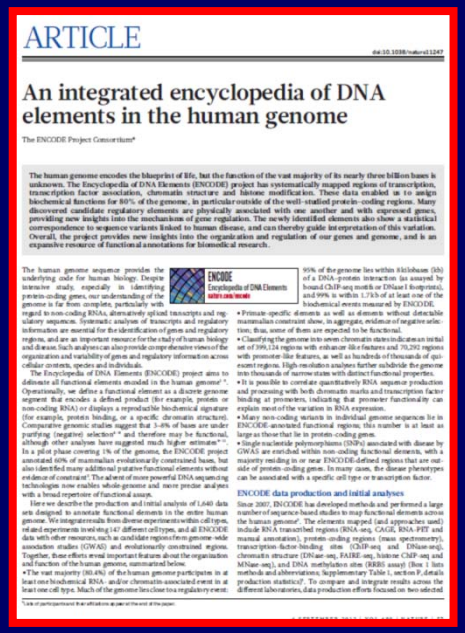
The goal of sequencing a human genome for $1000 is well within reach, but that's just the beginning of the story. Once a genome is sequenced, researchers are left with the formidable challenge of analyzing and interpreting its embedded code — a complex task that requires sophisticated data analysis tools.

With increasingly dropping DNA sequencing costs, more and more researchers are generating large amounts of genome sequence data. With such data in hand, researchers then need to use many data analysis tools to detect genetic patterns underlying various common diseases, to diagnose diseases and to individualize treatments.

As one component of its new Genome Sequencing Program announced in December 2011, the National Human Genome Research Institute (NHGRI) has awarded six researchers approximately $4 million in fiscal year (FY) 2012 to create robust, well-documented and well-supported computer software programs for analyzing genome sequence data that can be readily adopted outside of large genome sequencing centers. Many sequence analysis tools have been developed and are publically available, but their use is often limited by the lack of experts who can install and use the tools.

ENCODE

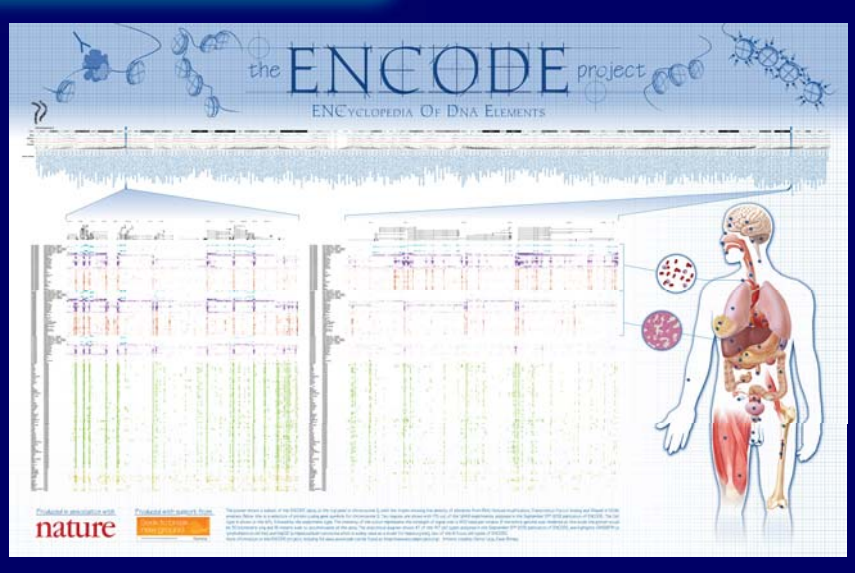



ARTICLE

An integrated encyclopedia of DNA elements in the human genome

The ENCODE Project Consortium*

The human genome encodes the blueprint of life, but the function of the vast majority of its nearly three billion bases is unknown. The Encyclopedia of DNA Elements (ENCODE) project has systematically mapped regions of transcription, transcription factor association, chromatin structure and histone modification. These data enabled us to assign biochemical functions for 80% of the genome, in particular outside of the well-studied protein-coding regions. Many discovered candidate regulatory elements are physically associated with one another and with expressed genes, providing new insights into the mechanisms of gene regulation. The newly identified elements also show a statistical correspondence to sequence variants linked to human disease, and can thereby guide interpretation of this variation. Overall, the project provides new insights into the organization and regulation of our genes and genome, and is an expansive resource of functional annotations for biomedical research.



Document 23

ENCODE

‘Junk DNA’ concept debunked by new analysis of human genome

The Washington Post | Politics | Opinions

Health & Science

Researchers: 'Junk' DNA plays major role in disease

By Dan Vergano, USA TODAY

Comment | Recommend 60 | Tweet 29 | +1 2

USA TODAY

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CNN Health

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DNA project interprets 'book of life'

The New York Times

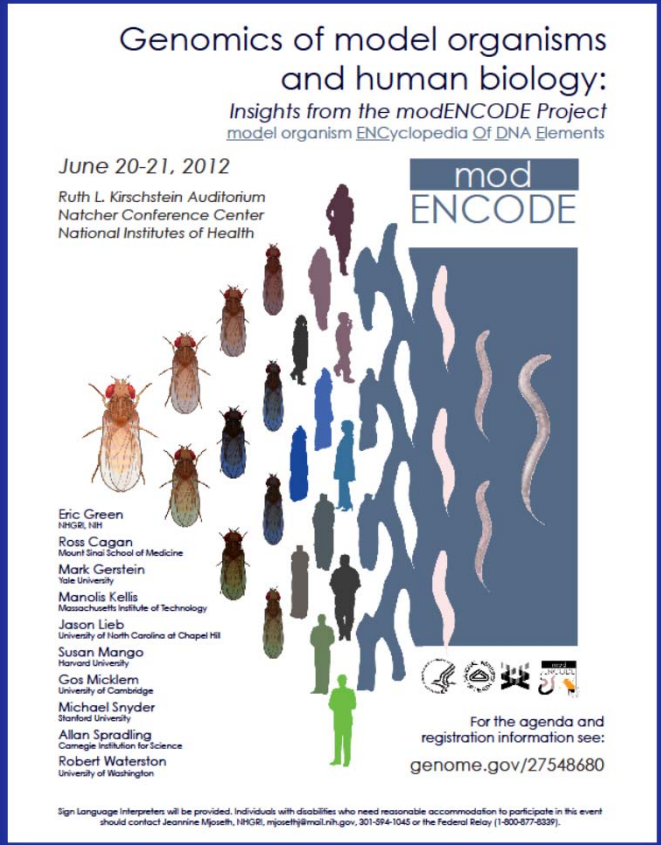
BEASTS OF THE SOUTHERN WILD

September 5, 2012

Far From Junk,‘ DNA Dark Matter Plays Crucial Role

modENCODE & ENCODE

- **modENCODE Symposium in June 2012**
- **Next round of ENCODE grants to be funded by the end of September**



Document 23

Centers of Excellence in ELSI Research (CEER) Program

- New CEER applications received in July; to be discussed at February Council meeting
- 8th Annual CEER Investigators Meeting in October

Document 24

Genomic Medicine RFAs

- **Genomic Medicine Pilot Demonstration Projects (U01)**

  Receipt Date: July 19, 2012

- **Population Architecture Using Genomics and Epidemiology (PAGE), Phase II (U01)**

  Receipt Date: October 18, 2012

- **Clinically Relevant Genetic Variants Resource: A Unified Approach for Identifying Genetic Variants for Clinical Use (U01)**

  Receipt Date: October 23, 2012

- **Genomic Sequencing and Newborn Screening Disorders (U19)**

  Receipt Date: November 19, 2012

Upcoming Meetings

- CEGS Annual Grantee Meeting (October)

- ENCODE and the Common Fund Epigenomics Program Joint Tutorial at ASHG (November)

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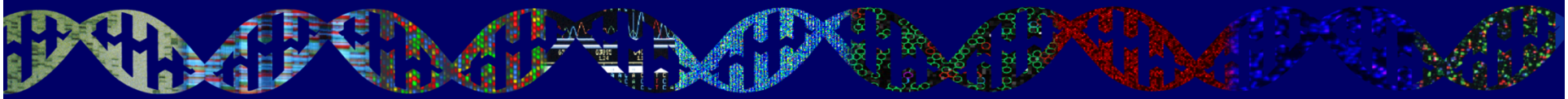


Molecular Libraries Program (MLP)

- MLP beginning 5th Year of Production Phase
- Start of ‘ramp down’ in funding
- Network reduced to five centers
- Comprehensive & chemistry centers remain
- BioAssay Research Database (BARD)
- MLP ends after Year 6

Human Microbiome Project (HMP)

***Nature*: 2 Consortium papers**

***PloS* Collection: 18 associated papers**

Document 27

HMP Press Coverage

4 Wires

13 Dailies

5 International outlets

8 Science publications

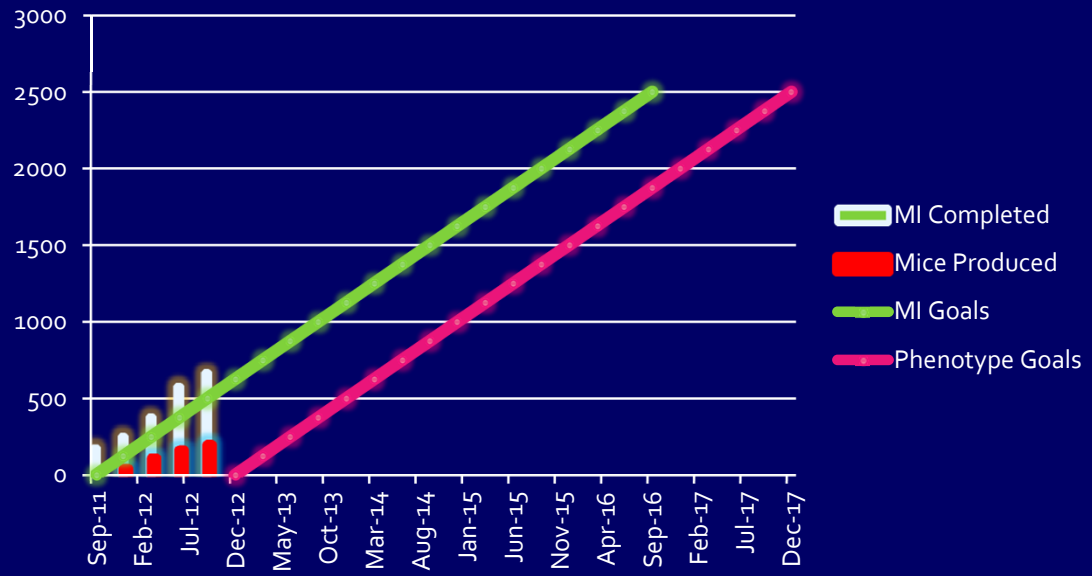
2 Business magazines

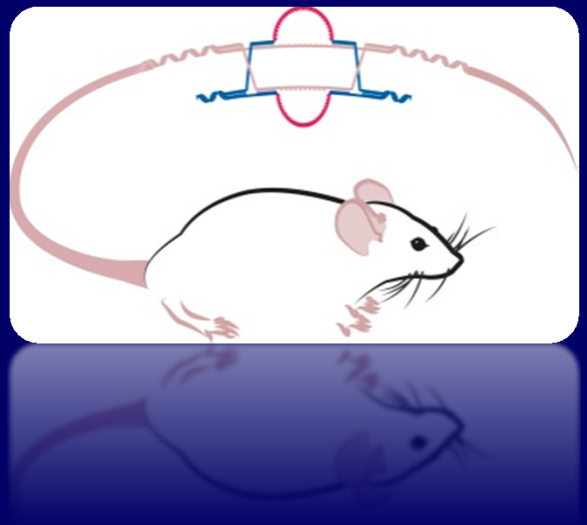
1 PBS NewsHour

Document 27

Knockout Mouse Phenotyping Project (KOMP^2)

In 5 years, make and phenotype 2,500 live mouse strains from knockout ES cells

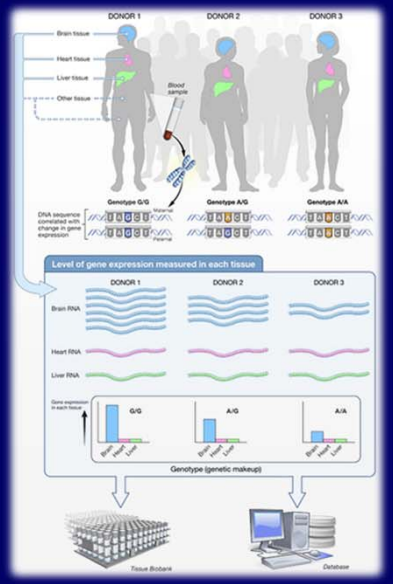




Document 28

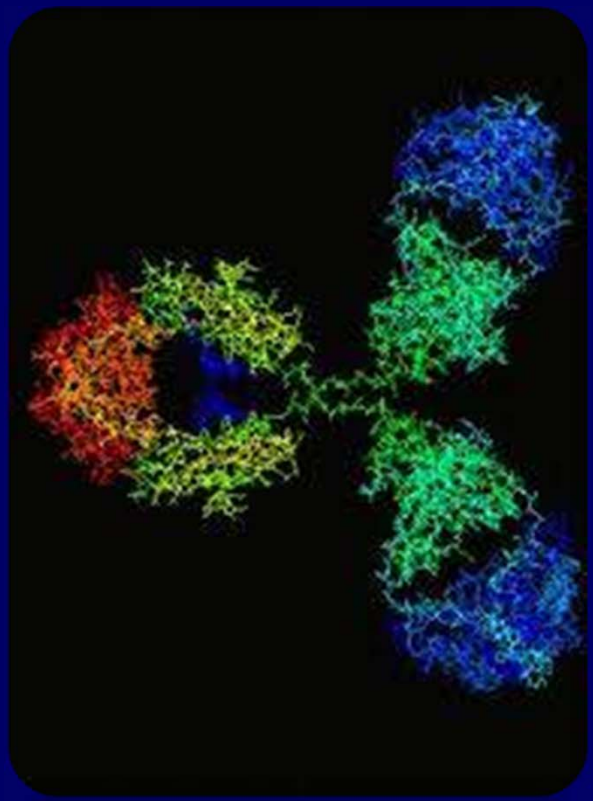
Genotype-Tissue Expression (GTEx)

- Scale-up approved
- Ultimate resource of:
  - 900 post-mortem donors
  - Fully genotyped
  - RNA-Seq (>20,000 samples, 30 organs)
- Quarterly dbGaP data releases
- ELSI study of donor families



Protein Capture Reagents Program

- External Scientific Panel meeting in July 2012
- $500K supplement request for antigen center approved
- Production Centers site visits in February 2013
- Website seeking input on human transcription factor priority list



Document 30

- **NIH and Wellcome Trust (WT) H3Africa awards released in August 2012**
- **Inaugural Meeting of the H3Africa Consortium to be held in Ethiopia in October 2012**
  - **Official press announcement of NIH & WT awards**
  - **Presentations by NIH & WT grantees**
  - **Discussion of H3Africa policies (e.g., data release, resource sharing, and consent)**
  - **Discussion of implementing H3ABioNet (the H3Africa bioinformatics network) and the H3Africa biorepositories**

Document 31

H3Africa

Human Heredity and Health in Africa

- **Independent Expert Committee (Barry Bloom and Kay Davies, Co-Chairs)**
- **New FOA for the H3Africa ELSI Program released in June 2012**
- **Re-issued FOAs for H3Africa Collaborative Centers, Research Projects, and Biorepositories in August 2012**

NIH Director's Award:
H3Africa Program Staff Recipients

Undiagnosed Diseases Program (UDP)

- To assist patients with unknown disorders reach an accurate diagnosis
- To discover new diseases that provide insight into human physiology and genetics
- ~500 patients to date; definitive diagnoses in 39
- 16 new human genetic disorders identified

Document 32

UDP: A New Common Fund Program

- Expansion to a national UDP Network
- Network of ~6 Extramural sites
- Improved data storage, access, and analysis
- Training and fellowship programs for rare disease diagnostics
- Next steps:

  Request for Information (RFI) – Sept. 18, 2012
  Investigator Webinar – September 2012
  Public Webinar – October 2012

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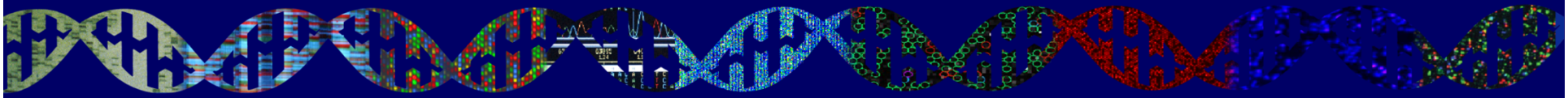

GENOMICS in Medicine Lecture Series

First Friday of each month, 8-9 AM

Suburban Hospital Auditorium

November 2: Max Muenke, NHGRI

Genetics and Genomics of Attention Deficit Hyperactivity Disorder

Invited Speakers: November 2012 through February 2013

Max Muenke, NHGRI
Ellen Sidransky, NHGRI
Kenneth Fishbeck, NINDS
William Figg Sr., NCI

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DEPARTMENT OF HEALTH & HUMAN SERVICES · USA

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Document 33

2012 Summer Workshop in Genomics

- Participants included 28 biology and nursing school faculty and 12 pre-doctoral students
- Lectures given by researchers and staff from across NHGRI

Document 34

Advancing Pharmacist Education with G2C2

- Built on the November, 2011 meeting
- Commitment to using NHGRI's G2C2 tool
- Commitment to evaluating and revising current competencies for genomics education

Assessing the Economics of Genomic Medicine

- July 2012 Meeting
- Explored economics of integrating whole-genome sequencing in clinical care
- Identified needs include:
  - Formal methods for valuing 'personal utility'
  - Scalable economics evaluation methods for large numbers of variants/genes
  - More robust outcomes research for modeling economic scenarios

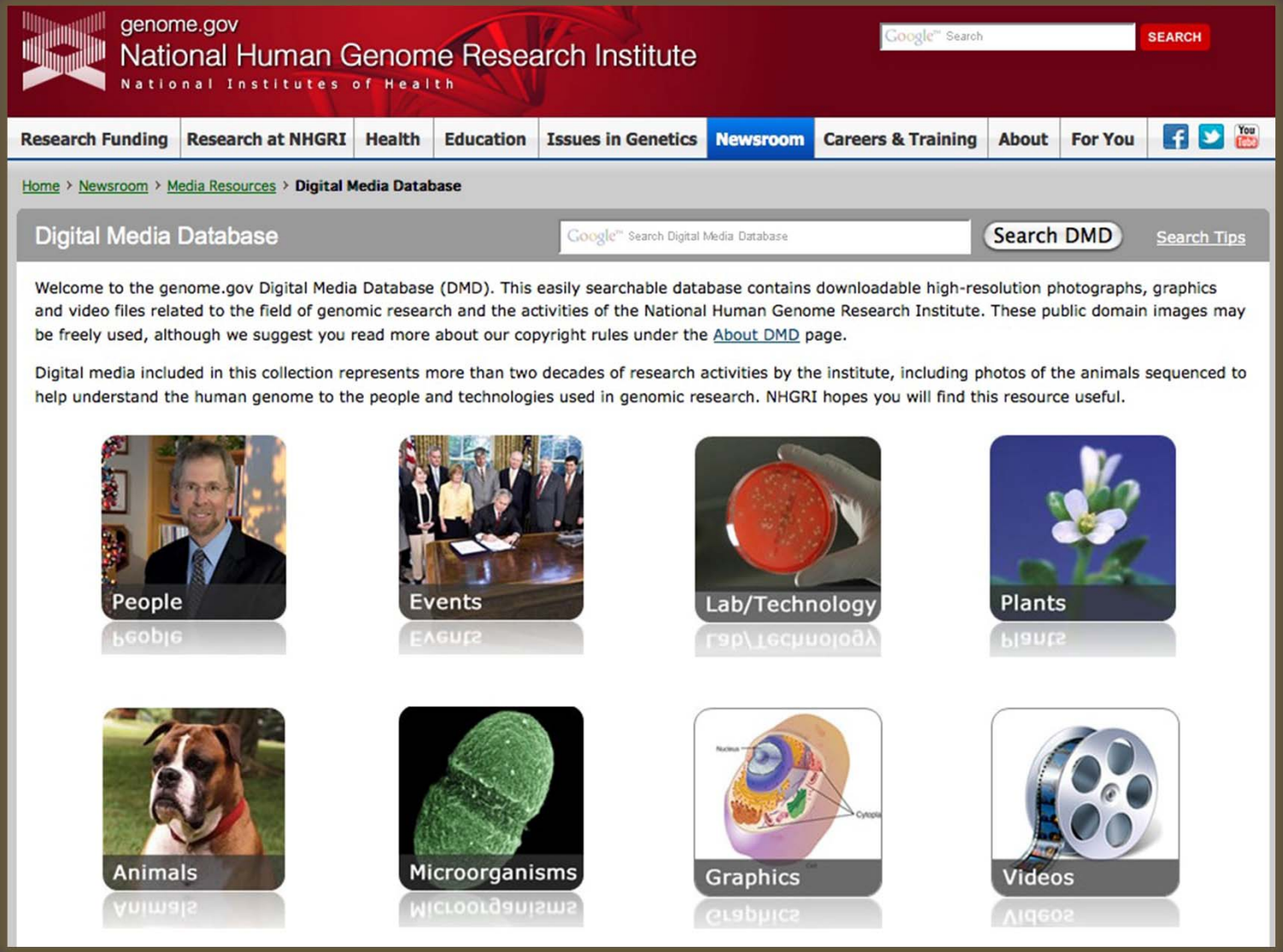
Document 35

Genomic Nursing State of Science: Establishing Future Research Directions

- Meeting convened to get input
- Nursing research recommendations posted for comment

Document 36

NHGRI Digital Media Database



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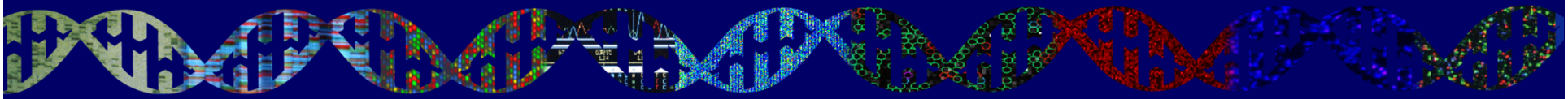

Tracking a ‘Super Bug’ in NIH Clinical Center

Science AAAS.ORG | FEEDBACK | HELP | LIBRARIANS Science Translational

ScienceTranslational Medicine Integrating Medicine and Science

RESEARCH ARTICLE

NOSOCOMIAL INFECTION

Tracking a Hospital Outbreak of Carbapenem-Resistant *Klebsiella pneumoniae* with Whole-Genome Sequencing

Document 38

NHGRI Intramural Research Highlights

AJHG The American Journal of Human Genetics

The American Society of Human Genetics
discover · educate · advocate

Secondary Variants in Individuals Undergoing Exome Sequencing: Screening of 572 Individuals Identifies High-Penetrance Mutations in Cancer-Susceptibility Genes

Immunity

Cell PRESS

Volume 36, Issue 6, 29 June 2012, Pages 1003–1016

Article

Positive and Negative Signaling through SLAM Receptors Regulate Synapse Organization and Thresholds of Cytolysis

BRAIN
A JOURNAL OF NEUROLOGY

The neurobiology of glucocerebrosidase-associated parkinsonism: a positron emission tomography study of dopamine synthesis and regional cerebral blood flow

Document 39

NIH Undiagnosed Diseases Program (UDP) on 60 Minutes

Dr. Camilo Toro explains a 'Hard Case' to CBS correspondent Lara Logan

Document 40

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National Human Genome Research Institute
National Institutes of Health

Special Thanks!


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through genomics research