DIRECTOR'S REPORT

National Advisory Council for Human Genome Research

February 2015

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

NIH National Human Genome Research Institute

Director's Report-Related Documents: February 2015

Director's Report

Director's Report

No.	Relevant Documents
1	New Video Spotlights NHGRI Programs
2	New NHGRI Executive Officer
3	**New Branch Chiefs, NHGRI Division of Policy, Communications, and Education** New Chief, Genomic Healthcare Branch New Chief, Education and Community Involvement Branch
4	Changing Role for Vence Bonham
5	Upcoming NHGRI Recruitment: Division of Genomic Medicine

genome.gov/DirectorsReport

Document #

Open Session Presentations

- Update on the Genomic Medicine Working Group

  Teri Manolio

- The Alzheimer's Disease Sequencing Project

  Eric Boerwinkle

Concept Clearance:

- Centers of Excellence in ELSI Research

  Joy Boyer

Open Session Presentations

Concept Clearances:

- **Genome Sequencing Program Analysis Satellites**
- **Genome Sequencing Program Coordinating Center**
- **High-Quality Human and Primate Genomes as Foundational Resources**
- **Comparative and Evolutionary Genomics**

Adam Felsenfeld

Open Session Presentations

- **Biennial Report on the Inclusion of Women and Minorities in NHGRI-Supported Research**

  Rongling Li

  Jacqueline Odgis

- **Review of the Statement of Understanding between NACHGR and NHGRI**

  Rudy Pozzatti

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 Division of Policy, Communications, and Education

VII. NHGRI Intramural Research Program

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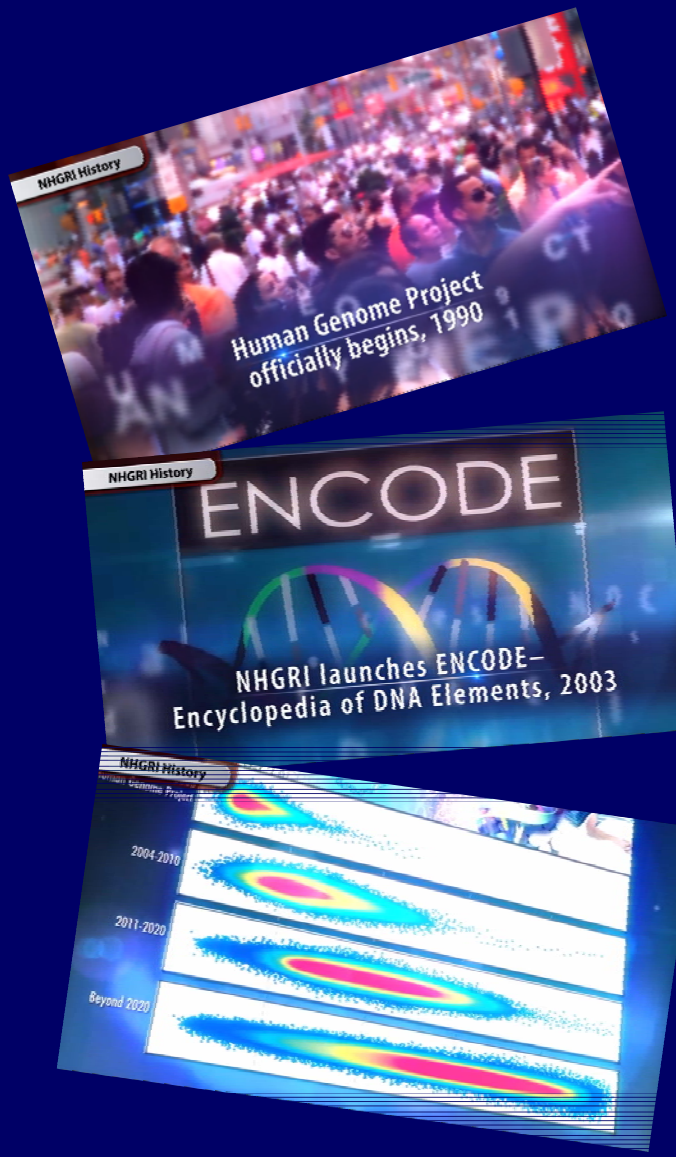
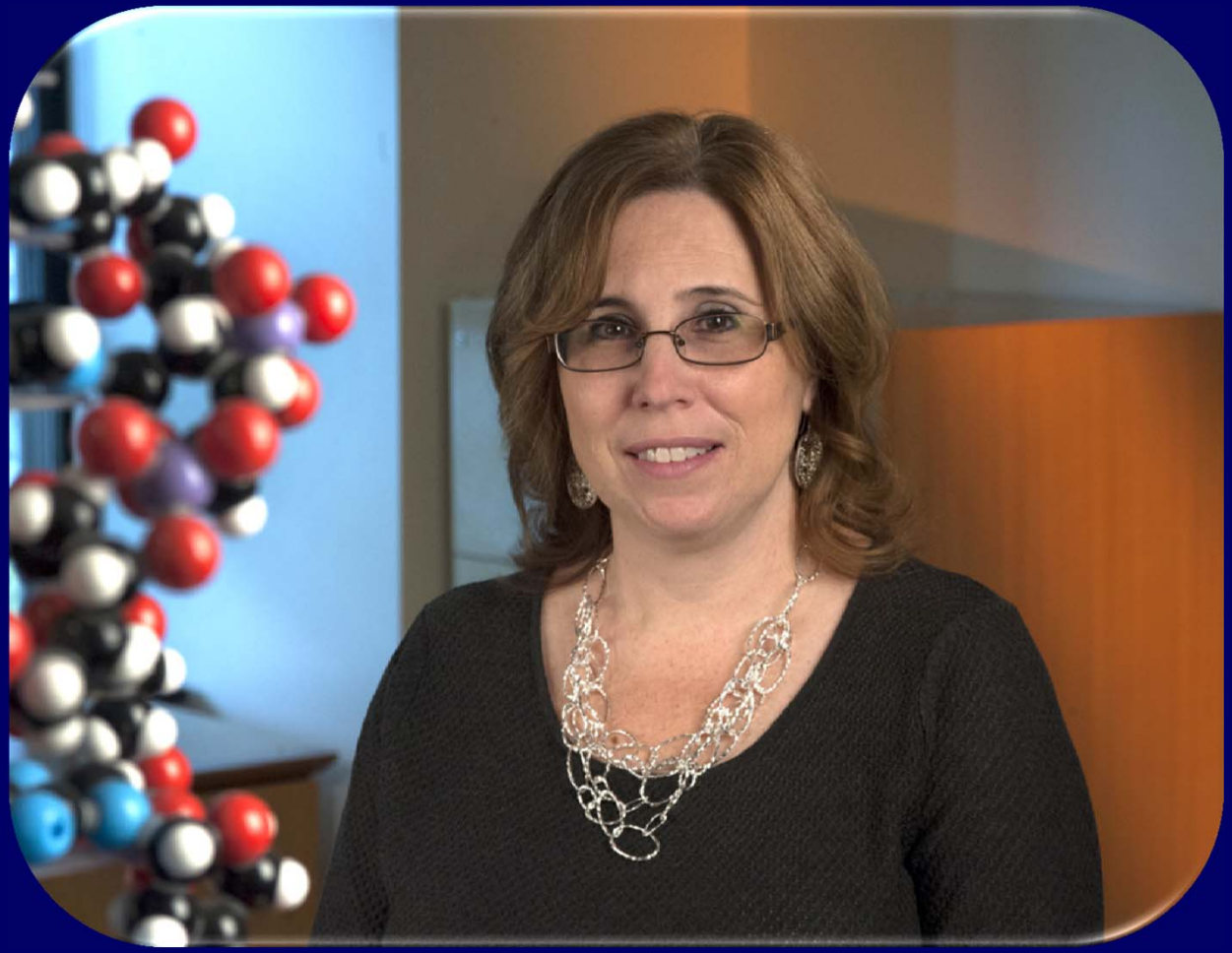
New Video Spotlights NHGRI Programs



Document 1

New NHGRI Executive Officer



Ellen Rolfes, M.A.

Document 2

New Chief, Genomic Healthcare Branch

Bob Wildin, M.D.

Changing Role for Vence Bonham

Vence Bonham, Jr., J.D.

Document 4

New Chief, Education and Community Involvement Branch

Carla Easter, Ph.D.

Document 3

Upcoming NHGRI Recruitment

Chief, Communications and Public Liaison Branch

Division of Policy, Communications, and Education

Contact: Dr. Laura Lyman Rodriguez
laura.rodriguez@nih.gov or 301-594-7185

Upcoming NHGRI Recruitment

Medical Officer

Division of Genomic Medicine

Vacancy opening soon:

Feb. 16 – Feb. 25, 2015

Contact: Dr. Teri Manolio

manolio@mail.nih.gov or 301-402-2915

NHGRI Implementation of NIH Genomic Data Sharing Policy

- January 25 is effective date for policy
- Consistent implementation across NHGRI portfolio
- Coordinating with NIH-wide implementation

Document 6

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President Obama Visits NIH

Document 7

Secretary Burwell Visits NIH

President Obama:
A Long-Standing Interest in Genomics

109TH CONGRESS
2D SESSION

S. 3822

To improve access to and appropriate utilization of valid, reliable and accurate molecular genetic tests by all populations thus helping to secure the promise of personalized medicine for all Americans.

IN THE SENATE OF THE UNITED STATES

AUGUST 3, 2006

Mr. OBAMA introduced the following bill; which was read twice and referred to the Committee on Finance

---

A BILL

To improve access to and appropriate utilization of valid, reliable and accurate molecular genetic tests by all populations thus helping to secure the promise of personalized medicine for all Americans.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Genomics and Personalized Medicine Act of 2006".

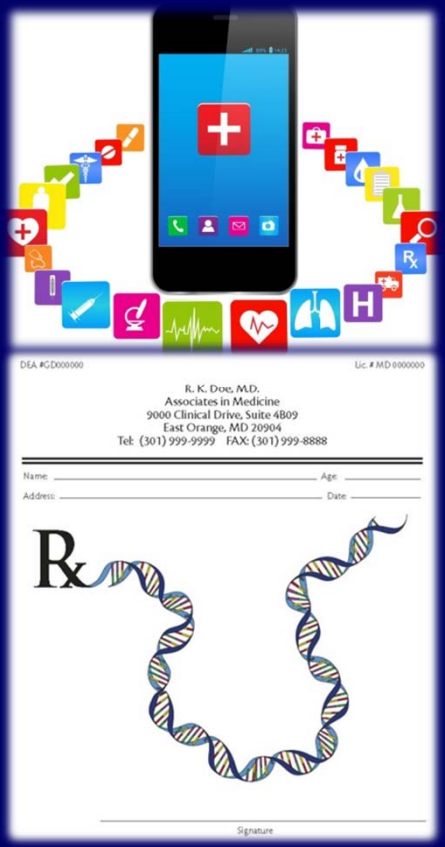
Senator Obama, 2006

A broader context for ‘individualizing’ medical care to advance human health

Precision Medicine

- **Today:** most medical care based on expected response of the average patient

- **Tomorrow:** medical care based on individual in genomic, environmental, and lifestyle differences that enable more precise ways to prevent and treat disease



How do we get from today to tomorrow?

President Obama's State of the Union Address: January 20, 2015

Document 8

“And that’s why the budget I send this Congress on Monday will include a new Precision Medicine Initiative that brings America closer to curing diseases like cancer and diabetes, and gives all of us access, potentially, to the personalized information that we need to keep ourselves and our families healthier.”

President Barack Obama

January 30, 2015

THE PRECISION MEDICINE INITIATIVE

The NEW ENGLAND JOURNAL of MEDICINE

January 30, 2015

Perspective

A New Initiative on Precision Medicine

Francis S. Collins, M.D., Ph.D., and Harold Varmus, M.D.

> "Tonight, I'm launching a new Precision Medicine Initiative to bring us closer to curing diseases like cancer and diabetes — and to give all of us access to the personalized information we need to keep ourselves and our families healthier."
>
> — President Barack Obama, State of the Union Address, January 20, 2015

The proposed initiative has two main components: a near-term focus on cancers and a longer-term aim to generate knowledge applicable to the whole range of health and disease. Both components are now within our reach because of advances in basic research, including molecular biology, genomics, and bioinformatics. Furthermore, the initiative

Document 9

Genomics

EHRs

Technologies

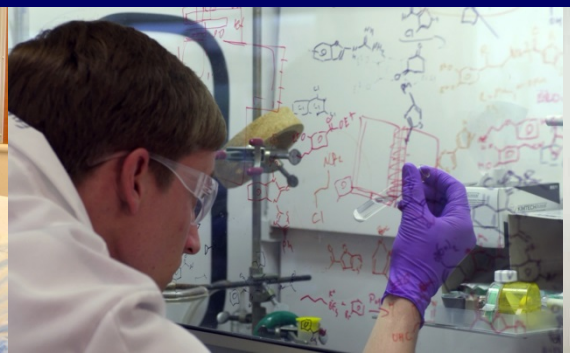
Data Science

Patient Partnerships

Precision Medicine Initiative: The Vision

- **NEAR TERM: Cancer as a Model of Precision Medicine**
  - Leading edge of precision medicine, yet more to learn
  - Ramp up current efforts to include more cancer types
- **LONGER TERM: Expanding the Model to Other Diseases**
  - Create national research cohort of >1 million volunteers
  - Generate knowledge base for precision medicine
- **POLICY CHANGES: Remove Barriers to Clinical Implementation**
  - Update federal rules protecting research participants
  - Advance FDA oversight of precision medicine products






Precision Medicine Initiative: Proposed Fiscal Year 2016 Funding

Agency	$ Million
National Institutes of Health	$200
Food and Drug Administration	$10
Office of the National Coordinator for Health Information Technology	$5
TOTAL	$215

Secretary Burwell Speaks Candidly at NIH


Obama seeks $215 million for personalized medicine effort
Washington Post
Obama to Unveil Research Initiative to Develop Tailored Medical Treatments
New York Times
Obama Announces $215 Million Precision-Medicine Genetic Plan
Wall Street Journal
Obama's $215 Million DNA Sequencing Project Is A Great Idea
Forbes
A Path for Precision Medicine
New York Times
Obama Seeks Millions for 'Precision Medicine'
NBC News

White House fleshes out Obama's $215 million plan for precision medicine

Science

Obama Enumerates Precision Medicine Initiative

The President requests $215 million to launch his push for personalized clinical care.

The Scientist

Obama to seek $215 million for precision-medicine plan

Details emerge as White House prepares to release budget request to Congress.

Nature

U.S. to Develop DNA Study of One Million People

An Obama initiative seeks to channel a torrent of gene information into treatments for cancer, other diseases.

MIT Tech Review

Senator Bill Cassidy (R-LA)

“This is an incredible area of promise,” said Senator Bill Cassidy, Republican of Louisiana and a gastroenterologist. “There will be bipartisan support.”

Obama to Request Research Funding for Treatments Tailored to Patients’ DNA

By ROBERT PEAR JAN. 24, 2015

New York Times

Precision Medicine Initiative: The Vision

- **NEAR TERM: Cancer as a Model of Precision Medicine**
  - Leading edge of precision medicine, yet more to learn
  - Ramp up current efforts to include more cancer types

- **LONGER TERM: Expanding the Model to Other Diseases**
  - Create national research cohort of >1 million volunteers
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- **POLICY CHANGES: Remove Barriers to Clinical Implementation**
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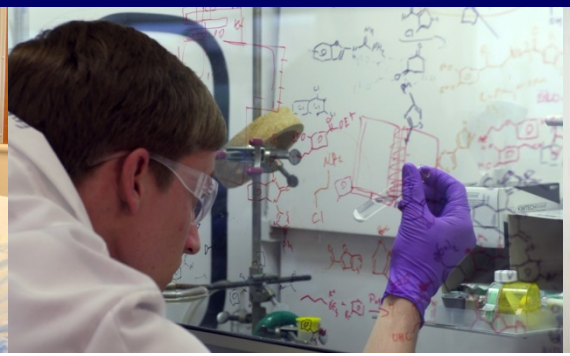
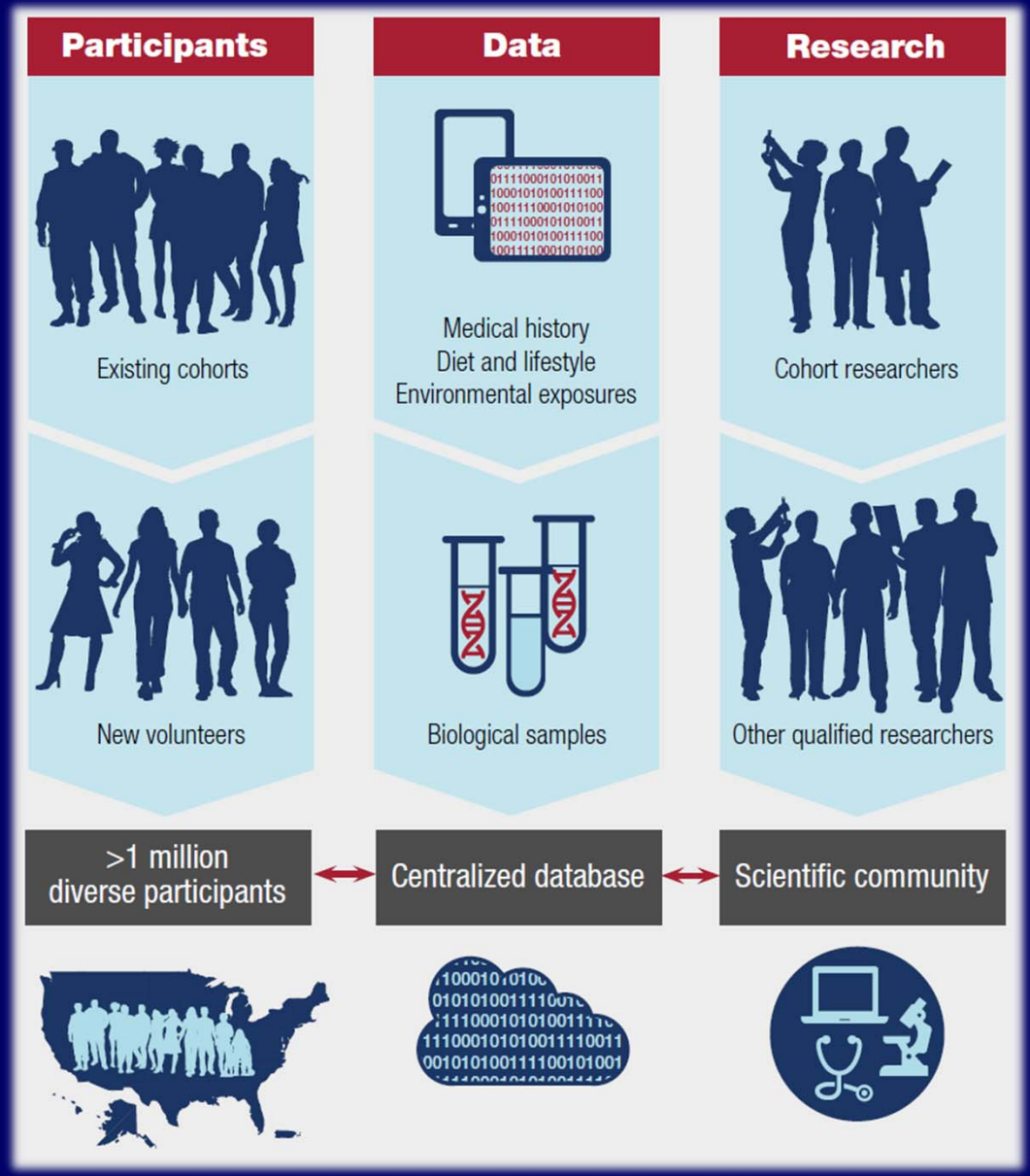



National Research Cohort

- **>1 million U.S. volunteers**
  - **Numerous existing cohorts (many funded by NIH)**
  - **New volunteers**
- **Participants to share genomic data, lifestyle information, biological samples – all linked to their EHRs**
- **Provide scientists with a ready platform for myriad new studies to propel understanding of health and disease**
- **Forge new model for 'doing science' that emphasizes engaged participants and open, responsible data sharing with strong privacy protections**

Document 9

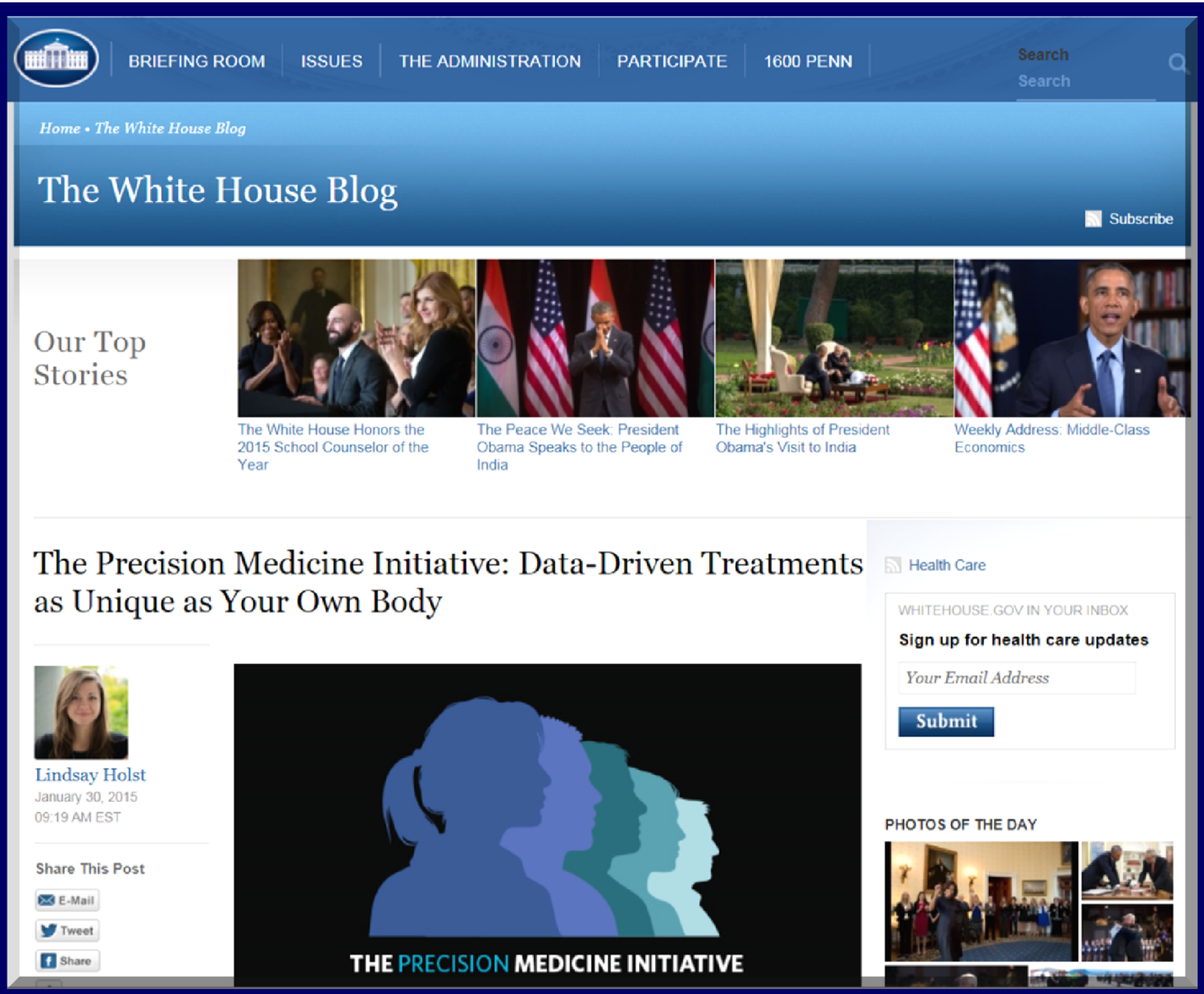
National Research Cohort: Components



Building a Large U.S. Cohort for Precision Medicine Research

- NIH workshop to be held February 11-12, 2015
- Representatives from a wide variety of fields
- Major areas of discussion:
  - Cohort identification and participant recruitment
  - Participant engagement, data privacy, and novel ways of returning information to participants
  - Data collection, including mobile technologies
  - Informatics and electronic health records

Document 9



www.whitehouse.gov/precisionmedicine

Document 9

U.S. Department of Health & Human Services

NIH National Institutes of Health
Turning Discovery Into Health

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NIH Home > Research & Training

PRECISION MEDICINE INITIATIVE

Precision Medicine Initiative

- What are the near-term goals?
- What are the longer-term goals?
- How is it different?
- Who will participate?
- NIH Workshop

Precision Medicine Initiative

Far too many diseases do not have a proven means of prevention or effective treatments. We must gain better insights into the biology of these diseases to make a difference for the millions of Americans who suffer from them. Precision medicine is an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person. While significant advances in precision medicine have been made for select cancers, the practice is not currently in use for most diseases. Many efforts are underway to help make precision medicine the norm rather than the exception. To accelerate the pace, President Obama has now unveiled the Precision Medicine Initiative – a bold new enterprise to revolutionize medicine and generate the scientific evidence needed to move the concept of precision medicine into every day clinical practice.

Email Updates

To sign up for updates please enter your e-mail address.

Submit

Related Links

- NEJM Perspective: A New Initiative on Precision Medicine
- White House Precision Medicine Web Page
- White House Fact Sheet: President Obama's Precision Medicine Initiative
- Precision Medicine Initiative and Cancer Research

www.nih.gov/precisionmedicine

Document 9

New U.S. Surgeon General

Vivek Murthy, M.D.

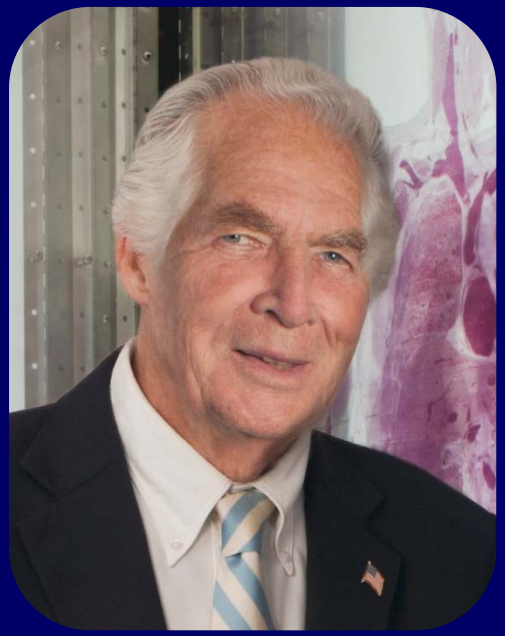
Document 10

U.S. FDA Commissioner to Step Down

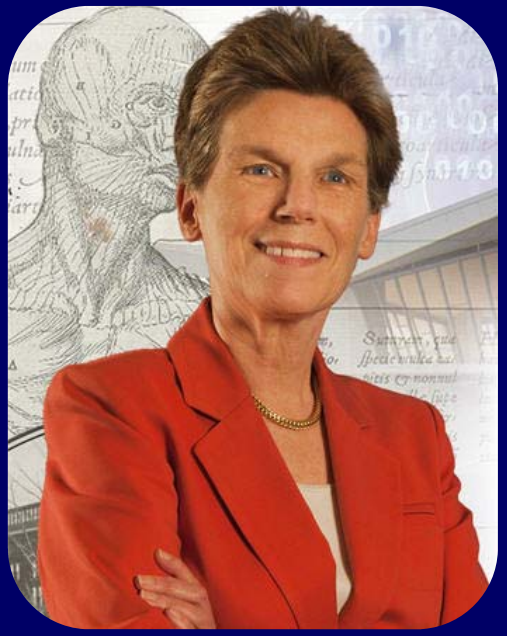
Margaret Hamburg, M.D.

Document 10

Retirement of Donald Lindberg



Donald Lindberg, M.D.



Betsy Humphreys, M.L.S.

NIH NLM

Document 11

National Library of Medicine Working Group

Co-Chairs: Eric Green &
Harlan Krumholz

Charge:

- Review mission, organization, and programmatic priorities
- Articulate a strategic vision for NLM

Report Due Date:
June 2015 ACD Meeting

Document 11

Cessation of the National Children's Study

Document 12

Renaming of an NIH Center: NCCIH

Document 13

New Associate Director for Science Policy, NIH

Carrie Wolinetz, Ph.D.

NIH National Institutes of Health

New Deputy Director, National Institute of General Medical Sciences

NIH NIGMS

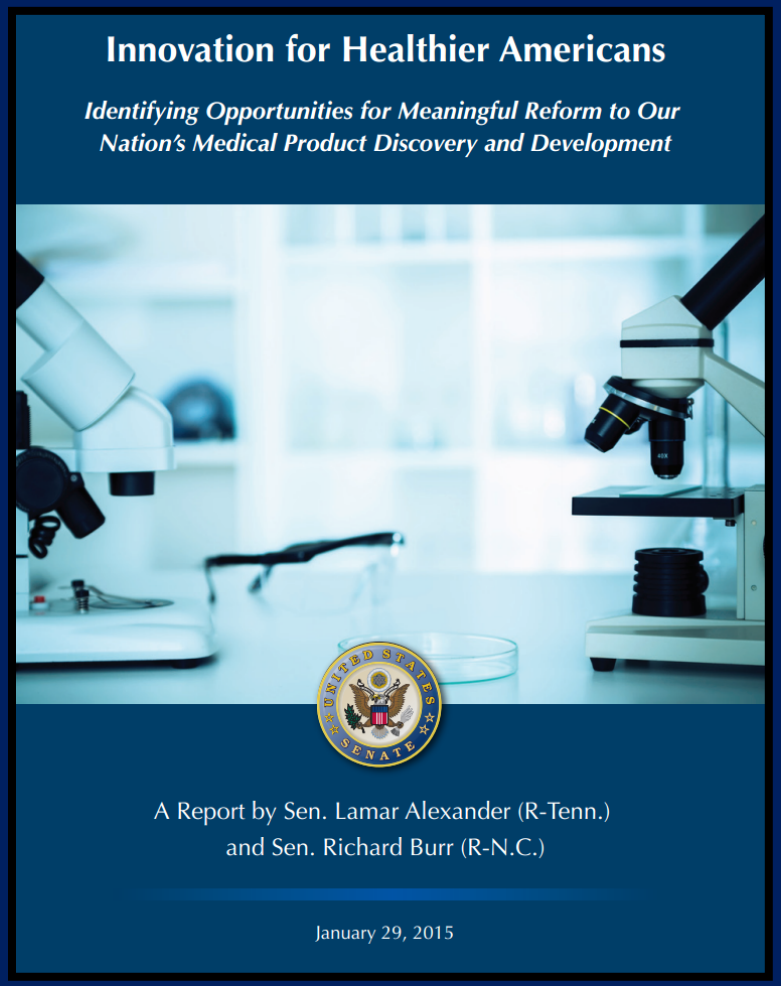
Judith Greenberg, Ph.D.

Document 14

21st Century Cures Act

Document 15

Health, Education, Labor, and Pensions (HELP) Committee Report



Document 16

Annual Appropriations

	Fiscal Year 2014	*Fiscal Year 2015*	*Fiscal Year 2016 President's Budget*
NIH	**$30.2 B**	**$30.3 B**	**$31.1 B**
NHGRI	**$498 M**	**$499 M (+0.3%)**	**$515 M (+3.2%)**

- **'CRomnibus' passed, establishing NHGRI Fiscal Year (FY) 2015 funding**
- **On February 2, President's Fiscal Year 2016 budget sent to Congress**

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Mourning the Loss of Mary Lyon

Document 18

National Medal of Science and National Medal of Technology and Innovation

Bruce Alberts, Ph.D.

Douglas Lowy, M.D. and
John Schiller, Ph.D.

Document 19

Lasker~Koshland Special Achievement Award in Medical Science

Mary-Claire King, Ph.D.

Document 20

Awards at 2014 ASHG Annual Meeting

David Valle, M.D.

Gonçalo Abecasis, D.Phil.

Mark Daly, Ph.D.

ASHG 2014
San Diego, CA | October 18-22

Document 21

2015 Breakthrough Prize in Life Sciences

Document 22

Elected to the Institute of Medicine

Goncalo Abecasis
Todd Golub
Julie Johnson
Harry Orr
Joe Takahashi

Document 23

Elected to AAAS

Nancy Allbritton
Russ Altman
Steven Benner
Lon Cardon
A. Chakravarti
Ronald DePinho
Geoffrey Duyk
Irene Eckstrand
Sean Eddy
Jeffrey Friedman
Dan Graur
Chuan He
Trey Ideker
Christine Keating
Bruce Korf
David Landsman
David Ledbetter
Brendan Lee
Joseph Loscalzo
Karen Mohlke
Jeffrey Murray
David Nelson
Michael Snyder
William Talbot

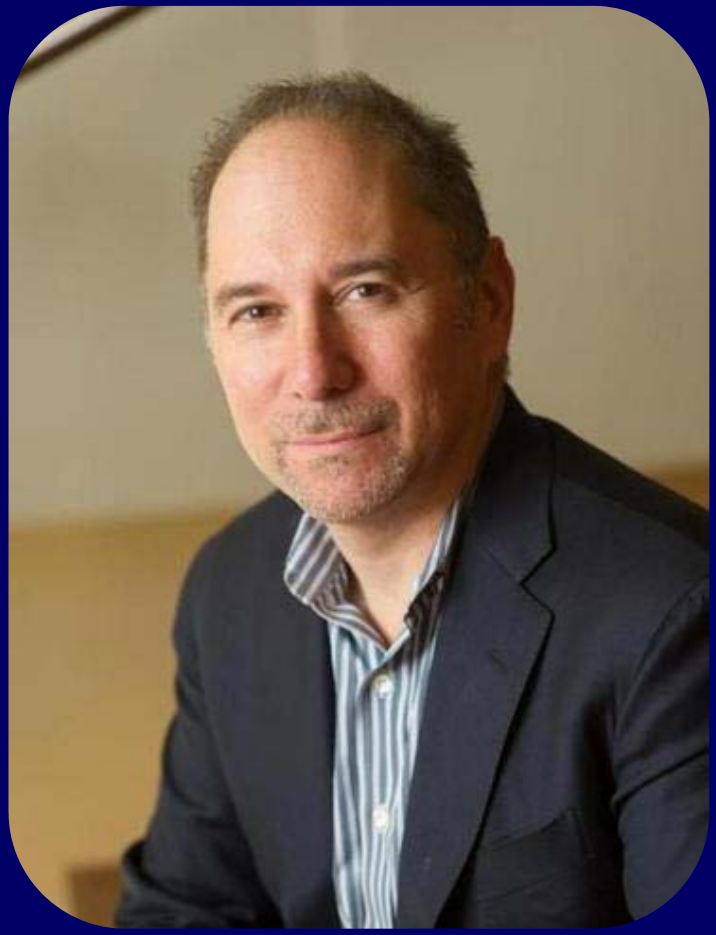
Document 24

New Director, Woods Hole Marine Biological Laboratory

Huntington Willard, Ph.D.

Document 25

New Executive VP of Global Research and Chief Scientific Officer, Vertex



VERTEX™

David Altshuler, M.D., Ph.D.

Document 26

Opening of the Jackson Laboratory of Genomic Medicine

Document 27

The Scientist's Top Ten Innovations 2014

1. **DRAGEN Bio-IT Processor** • **Edico Genome**
2. **MiSeqDx** • **Illumina**
3. **HiSeq X Ten** • **Illumina**
4. **IrysChip V2** • **BioNano Genomics**
5. **RainDrop Digital PCR System** • **RainDance Technologies**

Document 28

NHGRI Genome Advance of the Month

Investigating the Genomic Origins of the 2014 Ebola Outbreak

Exploring harmful interactions between artificial sweeteners and gut microbiota

Humans adapted to life at different latitudes by tuning their circadian "clocks"

Share Print

Researchers examine supercentenarians' genomes for longevity key

Share Print

Researchers detect cancer precursors in blood DNA before disease develops

Share Print

By Jacqueline A. Odgis
Scientific Program Analyst, NHGRI

Cost-effective, high throughput technologies used to analyze DNA are uncovering variations in our genetic code. Increasing numbers of these variations, sometimes referred to as mutations, are implicated in disease, including many cancers. With the ability to sequence DNA in the clinic, doctors can more definitively diagnose and predict patients' personal risks for developing cancer, based on the presence of these variants in their DNA.

For some types of cancer, the damaging variations are inherited. Thus, our parents' medical history might provide clues to disease risks to look for in ourselves. However, there are other types of changes that increase cancer risk that form in our cells after birth, before symptoms appear.

The question then is, how do we seek out those individuals who may be at higher risk, but have no history of cancer in their family? To help solve this problem, scientists are investigating "pre-cancerous" mutations that might allow us to catch, monitor and possibly treat cancer caught early in otherwise healthy patients.

The December *Genome Advance of the Month* explores the use of specific genetic mutations to identify patients at high risk for cancer, even in people without a family history of the disease. The research team, led by Giulio Genovese, Ph.D., of the Broad Institute at MIT and Harvard in Boston, focused on precursors for blood cancers like leukemia, lymphoma and myeloma. Though innovative drug therapies and increasing access to treatments have dramatically improved blood cancer survival, blood cancer remains one of the most common forms of cancer in the United States and worldwide. In 2014, blood cancer accounted for approximately 9.4 percent of the estimated 1,665,540 new cancer cases diagnosed across the country.

Document 29

Genomics In The News…

The New York Times

Young, Brilliant and Underfunded

By ANDY HARRIS OCT. 2, 2014

Ping Zhu

Forbes

PHARMA & HEALTHCARE 9/24/2014 @ 6:00AM | 4,649 views

The (Unmet) Potential Value of Cancer Genome Testing

THE WALL STREET JOURNAL.

Genome Sequencing in Babies to Begin as Part of Study

A Genetic Blueprint to Carry Through Life and Help Develop Personalized Treatments

Sequencing in newborns can prevent disease and lead to scientific breakthroughs later in life. WSJ's Amy Dockser Marcus discusses with Tanya Rivero. Photo: Children's Mercy Kansas City

genomeweb

Foundation Medicine Reimbursement Progress Marked by Google

TheScientist

EXPLORING LIFE, INSPIRING INNOVATION

Why, Oh Y?

A toothpick and a bit of chance shaped David Page's career, which he has dedicated to understanding the mammalian Y chromosome and fetal germ cell development.

By Jef Akst | January 1, 2015

Comment Like 32 Pin it +1 4 Link this Stumble Tweet this

DAVID C. PAGE

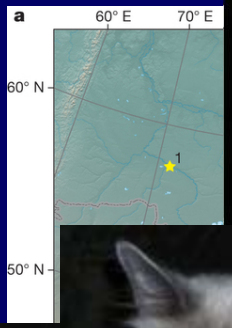
After his first year of medical school, David Page spent the summer working in Ray White's lab at the University of Massachusetts Medical School. "My project, using the technology of 1979, was to work toward and ultimately construct a genetic linkage map of the human genome," he recalls. It would take many people many years to complete the task, but what Page found that summer would ultimately drive his entire research career.

"We were picking bits of the human genome absolutely at random from what was then the first library of the human genome, the Maniatis lambda phage library," Page says. "I was literally picking—with a toothpick—lambda phage plaques that contained 15-kilobase segments of the human genome. And it turns out that one of my first toothpickings was of a lambda phage clone that contained a segment of DNA that derived from the human X and Y chromosomes." Page has now spent more than three decades researching the Y chromosome, defending it against hypotheses that it was slowly disappearing, and demonstrating its role both within and now outside the reproductive tract. "[For] every experiment that we've done since, I can trace an unbroken line back to that toothpick."

Page has helped clone and sequence the Y

Document 30

Genomes In The News…



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Genome Sequencing Program

- **Two RFAs released in mid-December 2014:**

  Centers for Common Disease Genomics (UM1):
  RFA-HG-15-001

  Centers for Mendelian Genomics (UM1):
  RFA- HG-15-002

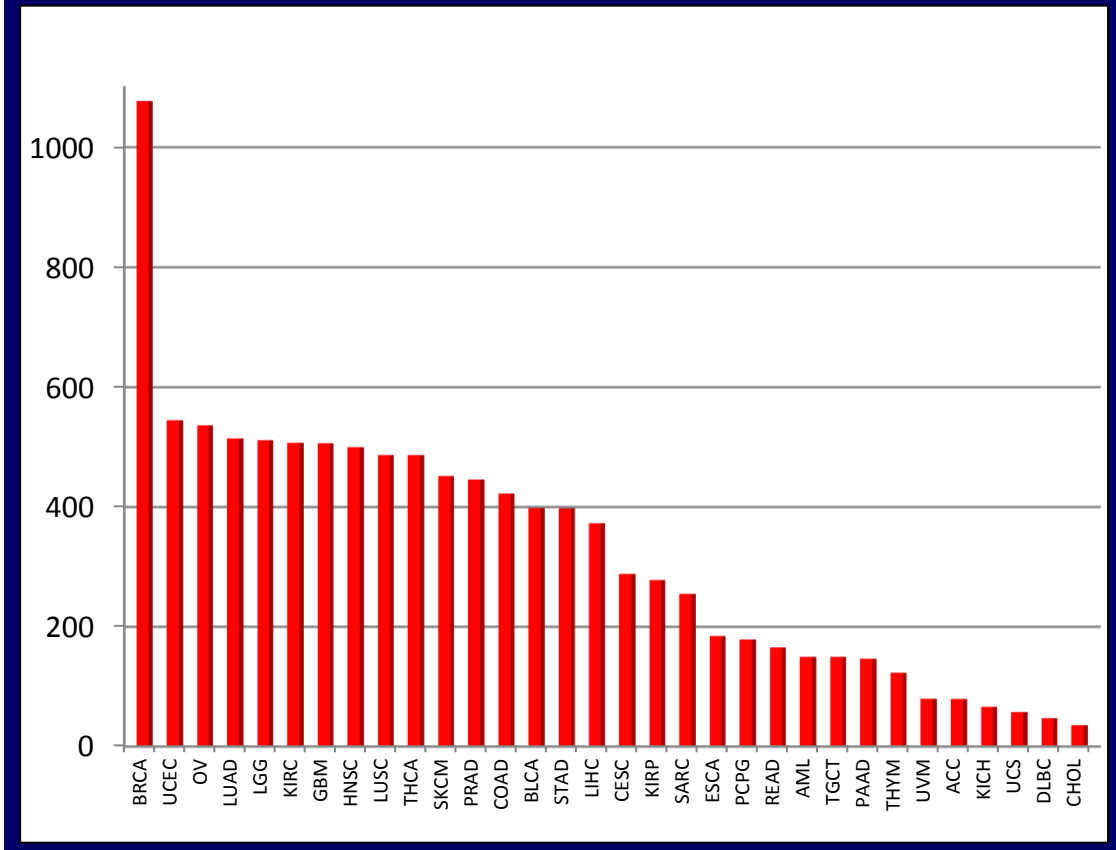
- **Applicant information webinar on February 18**

- **Submission deadline for both RFAs is April 7**

Large-Scale Genome Sequencing and Analysis Centers

- 54 new papers in most recent quarter
  - Microbiome
  - Comparative Genomics
  - Inherited Disease
  - Cancer
  - Technology Development

TCGA Exome Sequencing Progress



TCGA Tumor Publication Status

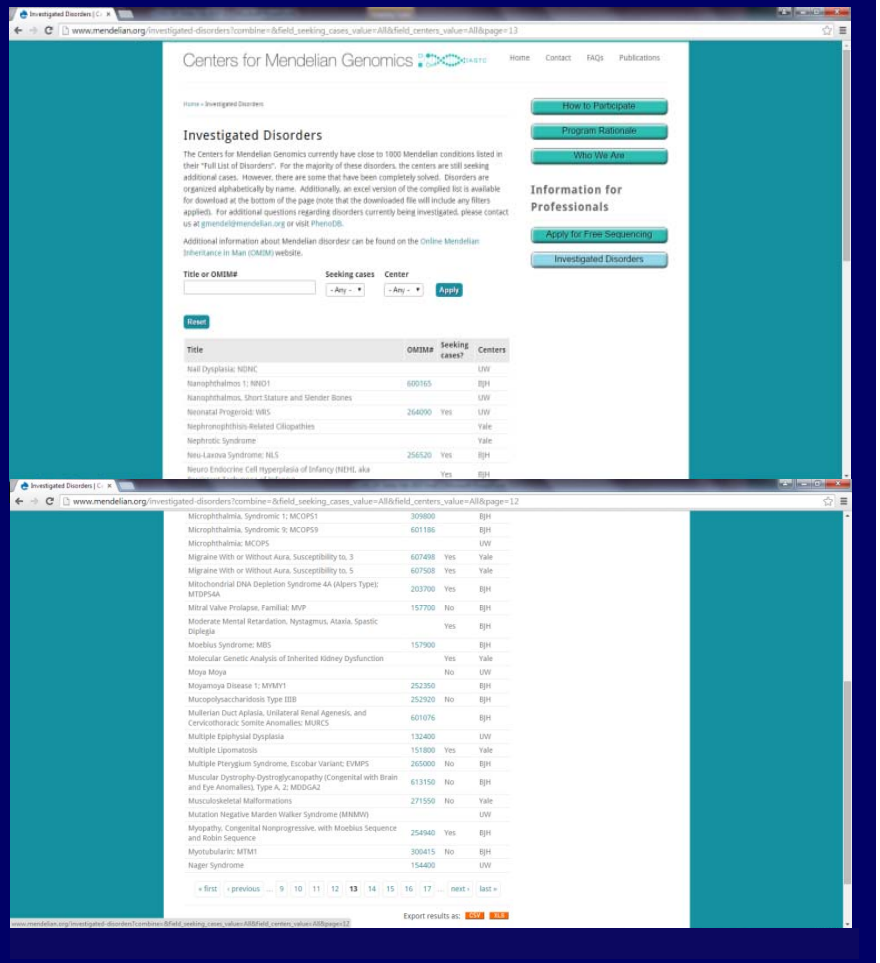
Cancer Type	Status	Year
Glioblastoma Multiforme 1	Nature	2008
Ovarian Carcinoma	Nature	2010
Breast Cancer	Nature	2012
Colorectal Adenocarcinoma	Nature	2012
Lung Squamous Cell Ca	Nature	2012
Acute Myeloid Leukemia	NEJM	2013
Uterine Corpus Endometrial Ca	Nature	2013
Kidney Renal Clear Cell Ca	Nature	2013
Glioblastoma Multiforme 2	Cell	2013
Bladder Urothelial Carcinoma	Nature	2014
Lung Adenocarcinoma	Nature	2014
Stomach Adenocarcinoma	Nature	2014
Chromophobe Renal Cell Ca	Cancer Cell	2014
Papillary Thyroid Carcinoma	Cell	2014
Head and Neck Squamous Ca	Nature	2015
Brain Lower Grade Glioma	Submitted	
Skin Cutaneous Melanoma	Submitted	

Centers for Mendelian Genomics

Finding the genes underlying human Mendelian conditions

Discovery

- Discovery of over 600 causal genes for Mendelian conditions
- Over 125 publications



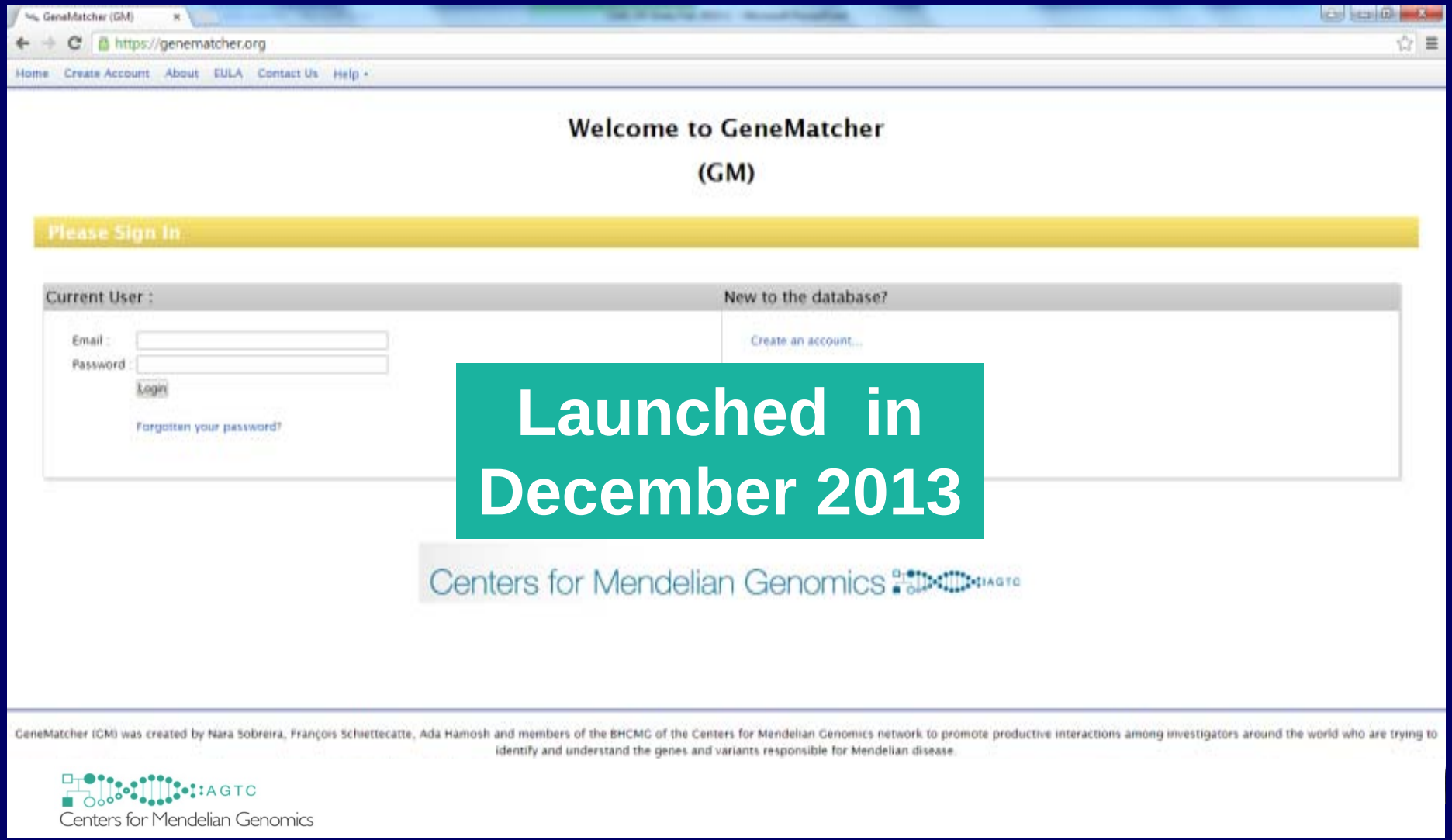
Public Project List

- Downloadable project list
- Annotation – OMIM #, project site, interested in additional cases or not
- About 1000 Mendelian disorders currently listed

Document 35

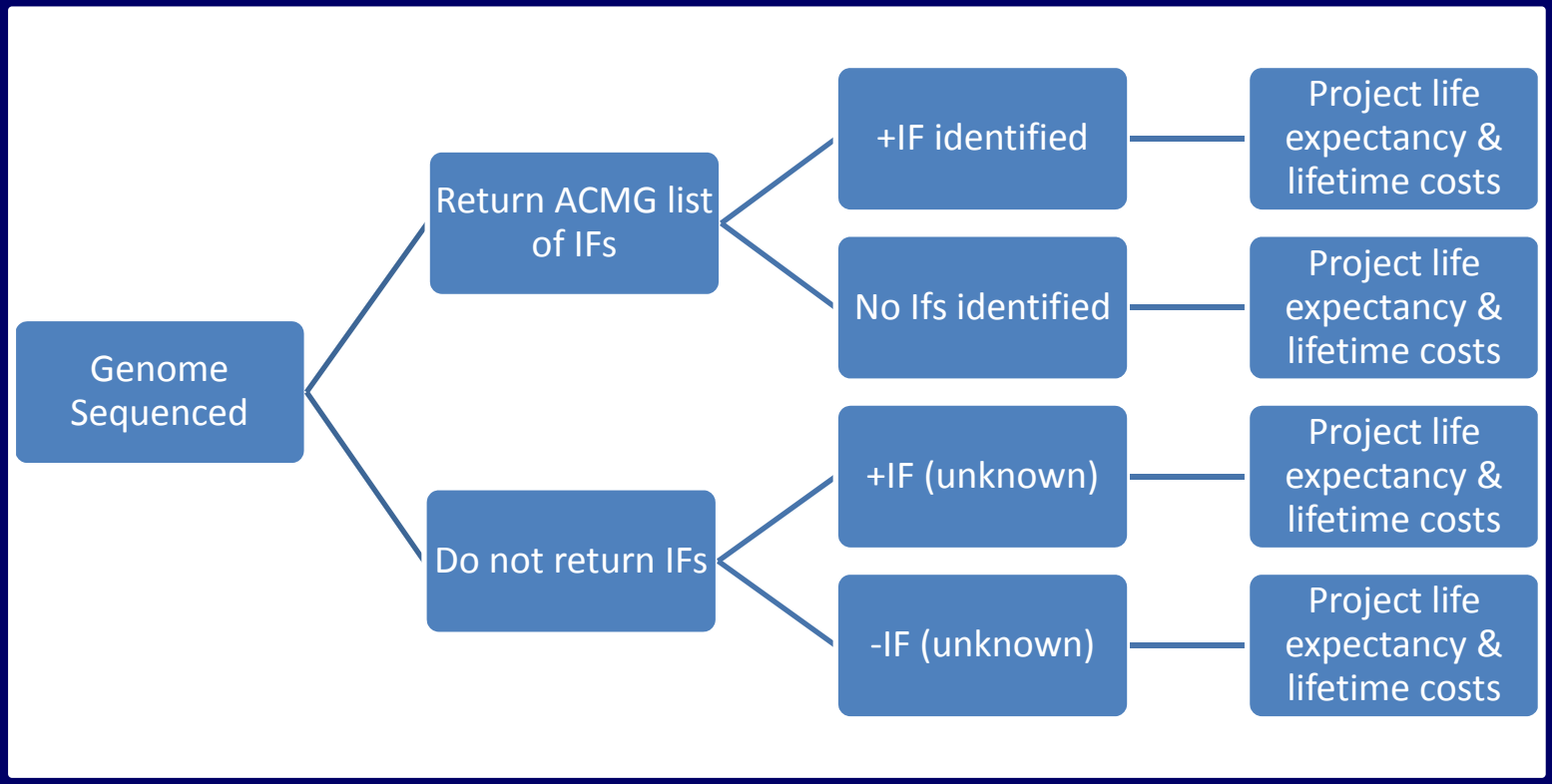
Centers for Mendelian Genomics

Finding the genes underlying human Mendelian conditions



Clinical Sequencing Exploratory Research (CSER) Program

- **Enrolled 3,058 adults, 707 children; 2,661 germline, 510 tumor sequences**



Bennette et al. , *Genetics in Medicine,* 2014

Clinical Sequencing Exploratory Research (CSER) Program

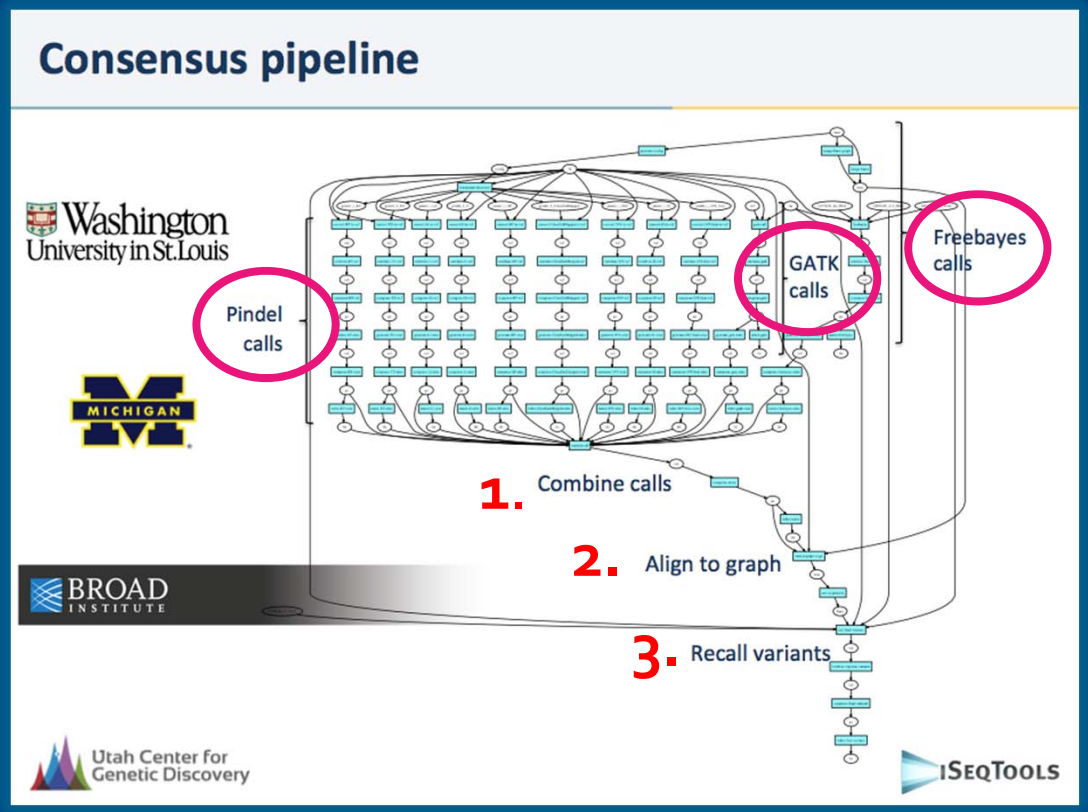
Examples of recent impact:

- >130 publications, 9 working group publications
- >200 presentations/posters

INSTITUTE OF MEDICINE
OF THE NATIONAL ACADEMIES

Genome Sequencing Informatics Tools

- iSeqTools provides GKNO pipelines that integrate results from multiple variant or mutation callers

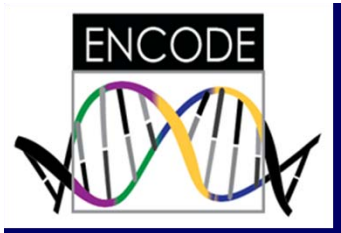


- Uses graph realignment to make best call
- IOBIO 'apps' for rapid, easy, visual analysis of data

DNA Sequencing Technology Development

- Grantee meeting and public meeting in May 2015

Sequencing Technology Grantees

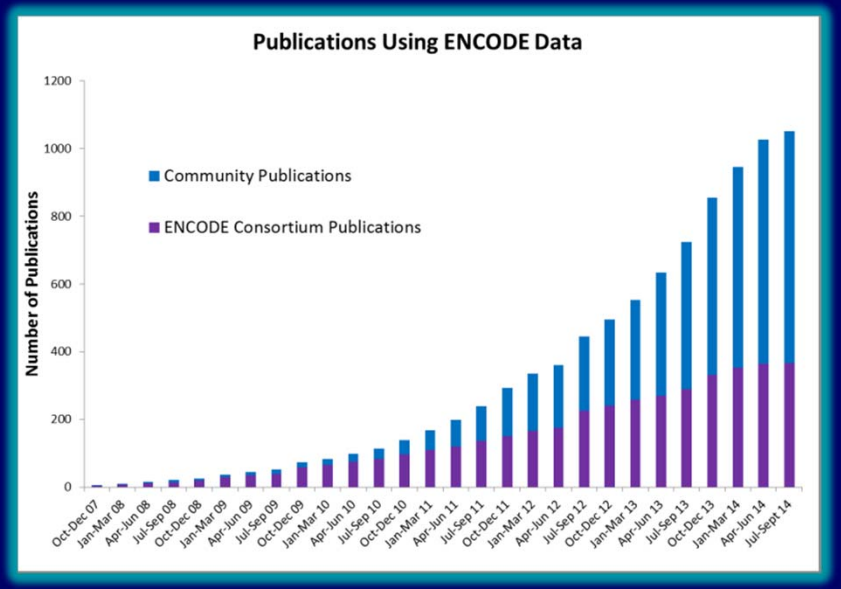


ENCyclopedia Of DNA Elements (ENCODE) Project

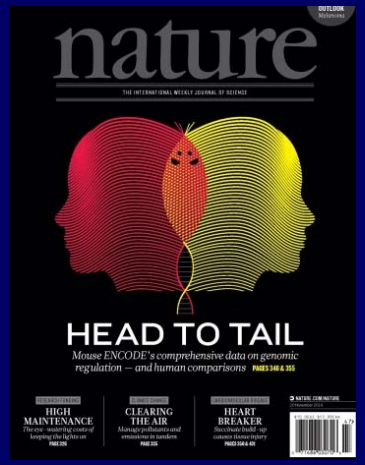
- **Planning workshop: "From Genome Function to Biomedical Insight: ENCODE and Beyond"**
  March 10-11, 2015; NIH Campus
- **Annual ENCODE Consortium Meeting**
  March 14-17, 2015; Cold Spring Harbor Laboratory
- **ENCODE User's Meeting with hands-on workshops**
  June 29-July 1, 2015; Bolger Center, Potomac, MD

ENCyclopedia Of DNA Elements (ENCODE) Project

- **ENCODE Publications →**



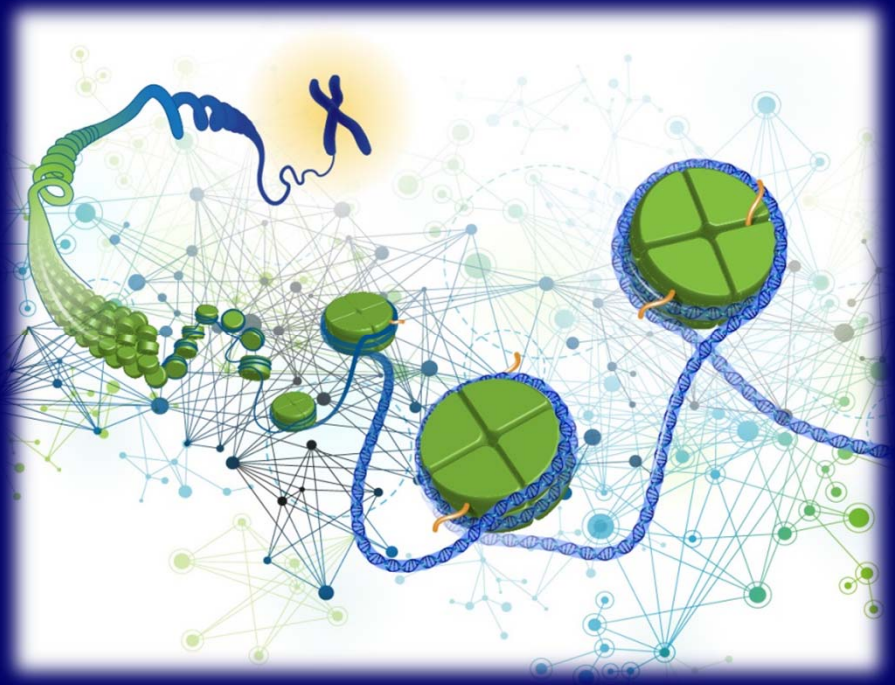
- **Mouse ENCODE integrative and companion papers published in late 2014**



Document 39

Genomics of Gene Regulation Project

- Goal: To learn how to derive predictive gene regulatory networks starting from genomic data
- Five awards issued in January 2015
- Biological systems include immune system, skin, and nuclear hormone receptor response



Document 40

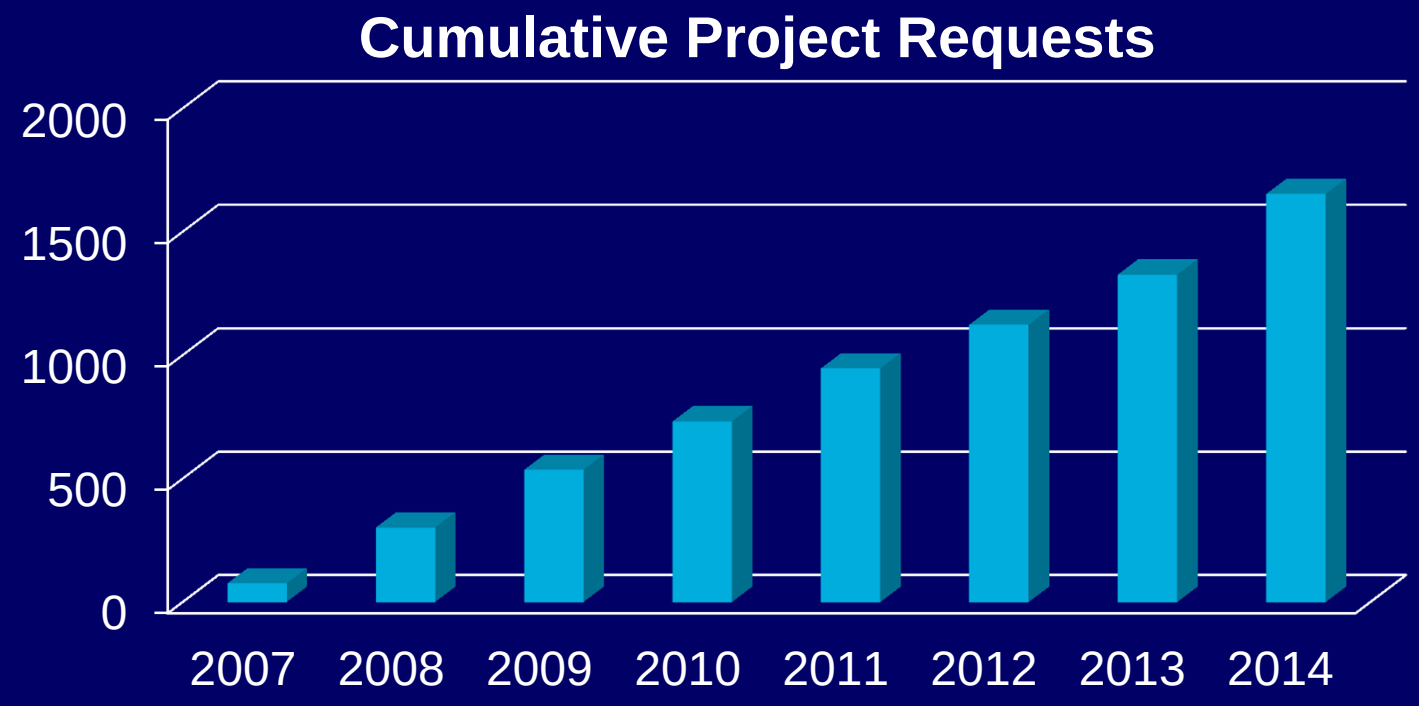
Centers of Excellence in Genomic Science (CEGS) Program

Two new CEGS awards:

- **Stanford University, Center for Personal Dynamic Regulomes**
- **Harvard Medical School, Neuropsychiatric Genome-Scale and RDoC Individualized Domains (N-GRID)**

GAIN Data Access Committee

- GAIN DAC retired in late 2014 and all GAIN datasets transferred to relevant NIH DACs
- Nearly 1,700 project requests from 878 investigators over the course of 8 years



Document 42

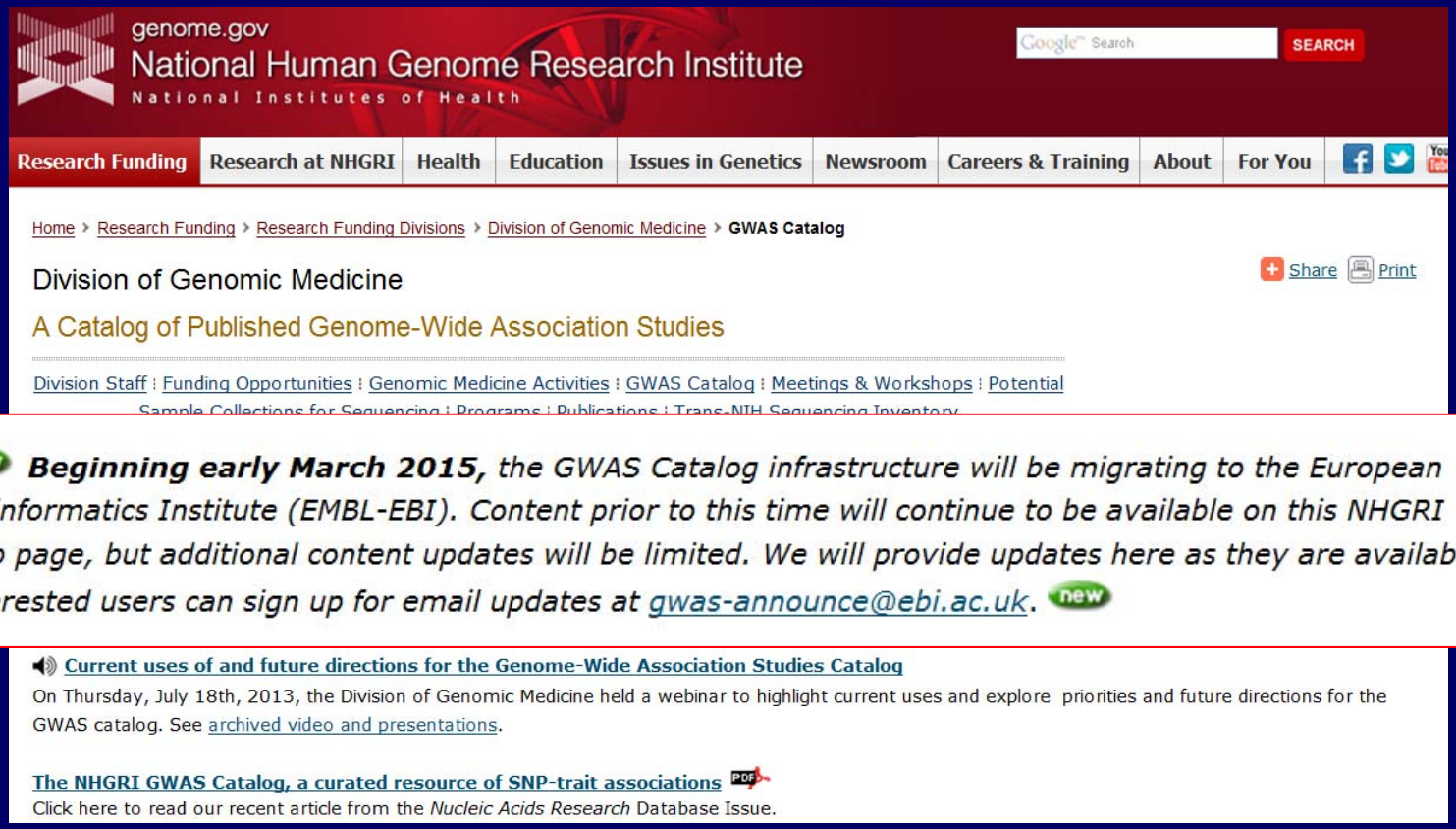
GWAS Catalog

- 15,000th variant
- 2,100th paper

NIH National Human Genome Research Institute

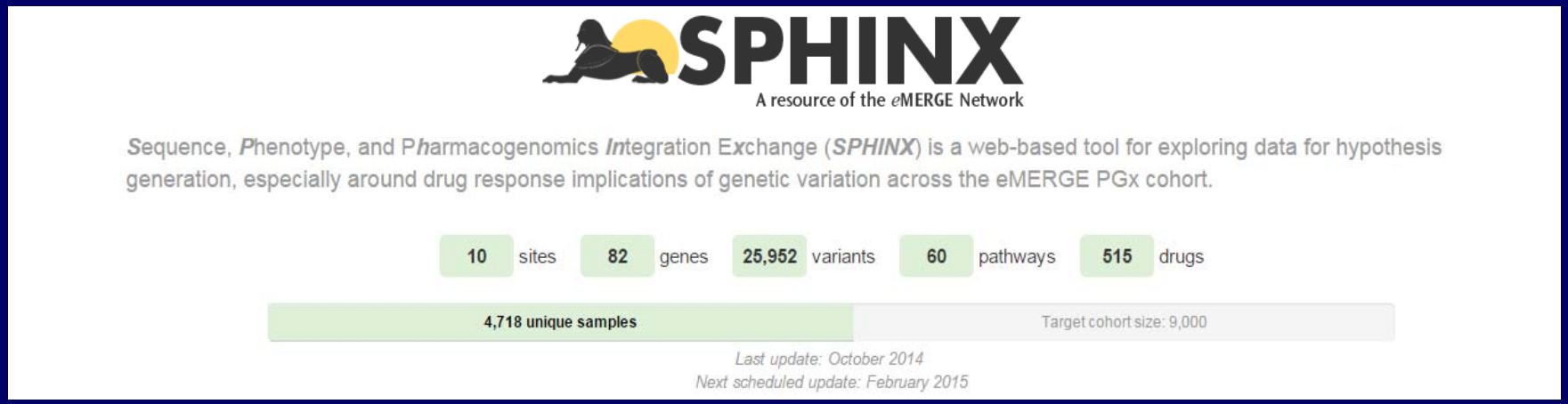
EMBL-EBI

GWAS Catalog



Document 43

The eMERGE Network
electronic Medical Records & Genomics



AMIA 2014 Distinguished Paper & Homer R. Warner Awards

Development and validation of an electronic phenotyping algorithm for chronic kidney disease

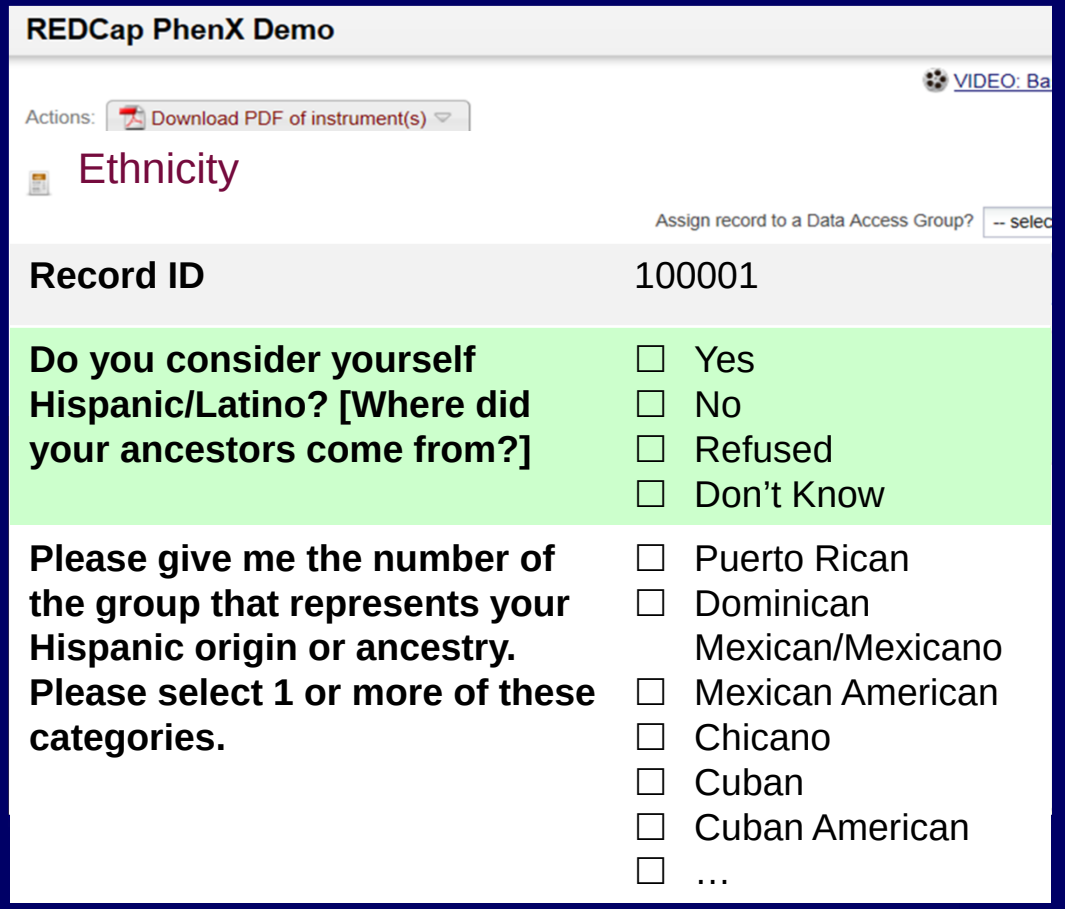
Girish N. Nadkarni, Omri Gottesman, James G. Linneman, Herbert Chase, Richard L. Berg, Samira Farouk, Rajiv Nadukuru, Vaneet Lotay, Steve Ellis, George Hripcsak, Peggy Peissig, Chunhua Weng, Erwin P. Bottinger

SOEMPI: A Secure Open Enterprise Master Patient Index Software Toolkit for Private Record Linkage

Csaba Toth, Elizabeth A. Durham, Murat Kantarcioglu, Yuan Xue, Bradley Malin

PhenX Toolkit

- NIMH suicide and PTSD measures released in December 2014
- New NHLBI funding for sickle cell disease
- PhenX protocols released in REDCap



REDCap
Research Electronic Data Capture

Document 45

PAGE Multi-Ethnic Genotyping (MEGA) Array

PAGE-related Traits

Multiethnic Exomic Variants

Functional Variants

GWAS Scaffold

African Diaspora Power Chip

Human Core Array

Human Exome Array

- Custom Content
- 36,000 Multiethnic Exomes
- ClinVar, OMIM
- 1000 Genomes Project
- Existing

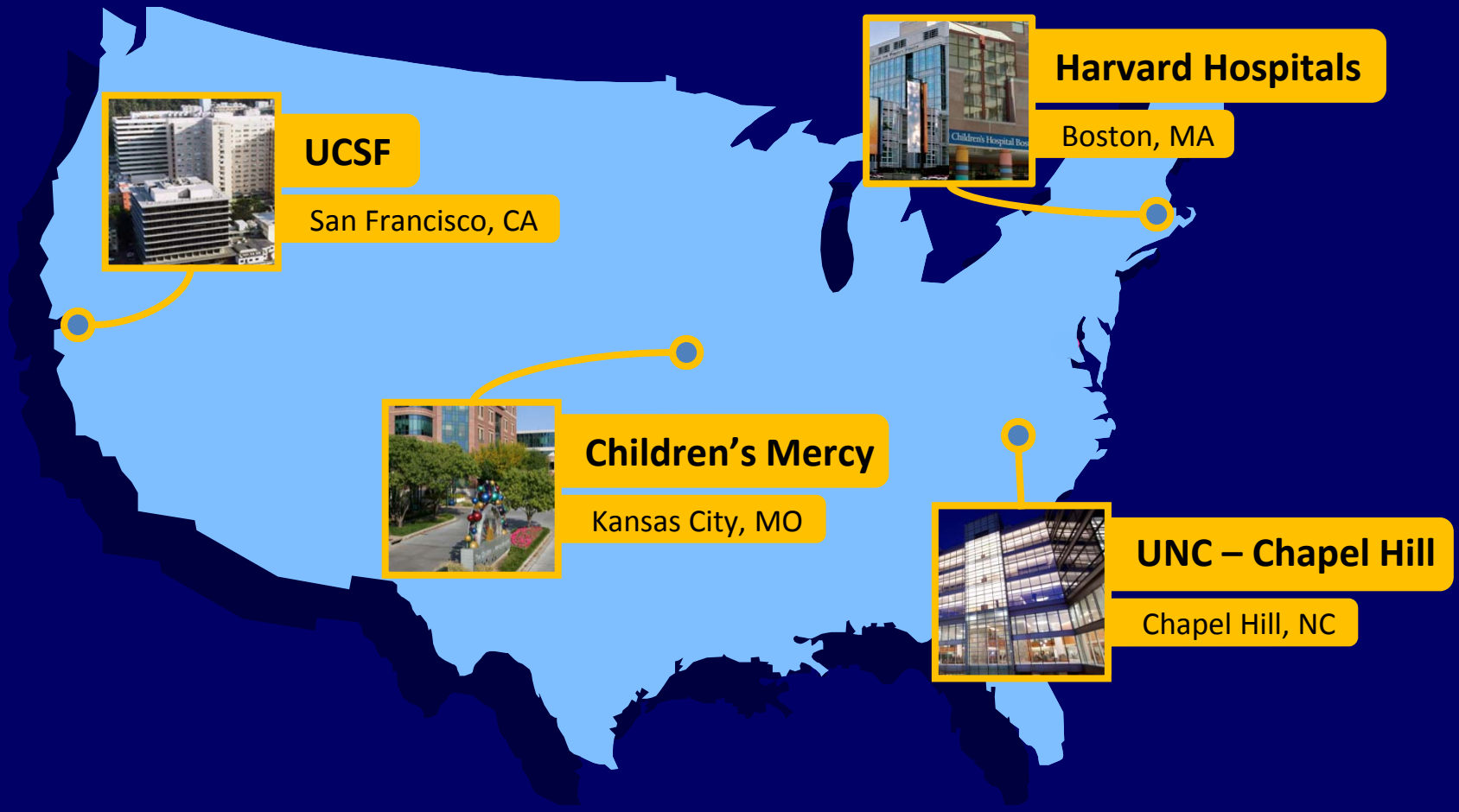
- **Standardizing clinical assessment of genomic variants and their deposition into ClinVar**

- **GenomeConnect: ClinGen's Patient Portal**

- **ClinGen-DECIPHER Public Meeting in May 2015**

GenomeConnect
The ClinGen Patient Portal

Newborn Sequencing In Genomic Medicine and Public HealTh (NSIGHT)



Genomics and Society Working Group

- Next in-person meeting in April 2015
- Outgoing members: Tim Caulfield, Jeff Long, Andrea Patenaude, and David Williams
- New members: Chanita Hughes-Halbert, Barbara Bernhardt, and David Veenstra
- Change in leadership:

Pamela Sankar, Ph.D.
University of Pennsylvania

Lisa Parker, Ph.D.
University of Pittsburgh

Document 49

ELSI Research Program

- New ELSI NRSA Institutional Training Grant (T32) mechanism
- Centers of Excellence in ELSI Research (CEER):

  First Regional CEER Networking Meeting
  February 23-24, 2015

  Annual CEER Investigator Meeting
  March 16-18, 2015

  New CEER RFA Concept Clearance

Document 50

Director's Report Outline

I. General NHGRI Updates

II. General NIH Updates

III. General Genomics Updates

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V. NIH Common Fund/Trans-NIH

VI. NHGRI Division of Policy, Communications, and Education

VII. NHGRI Intramural Research Program

Human Microbiome Project (HMP)

- HMP Phase 2: 'integrative HMP' (iHMP)
- iHMP marker paper (open access)
- iHMP Data Coordination Center
- 2nd iHMP Consortium Meeting

  June 2015

  Bethesda

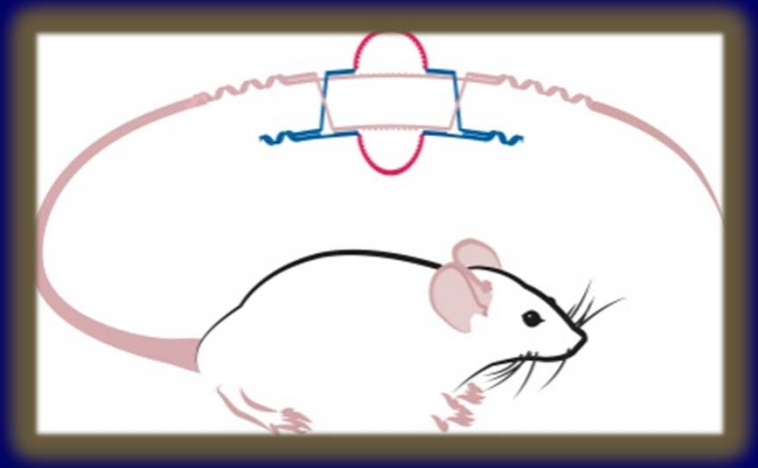
- 5th International Human Microbiome Consortium Congress

  March 2015

  Luxembourg

Document 51

Knockout Mouse Phenotyping Project (KOMP2)



IMPC
International Mouse Phenotyping Consortium

- International Mouse Phenotyping Consortium annual meeting in November
- Planning for renewal of KOMP2 program
- Sexual dimorphism evident in mutant phenotypes in the KOMP2 database

Document 52

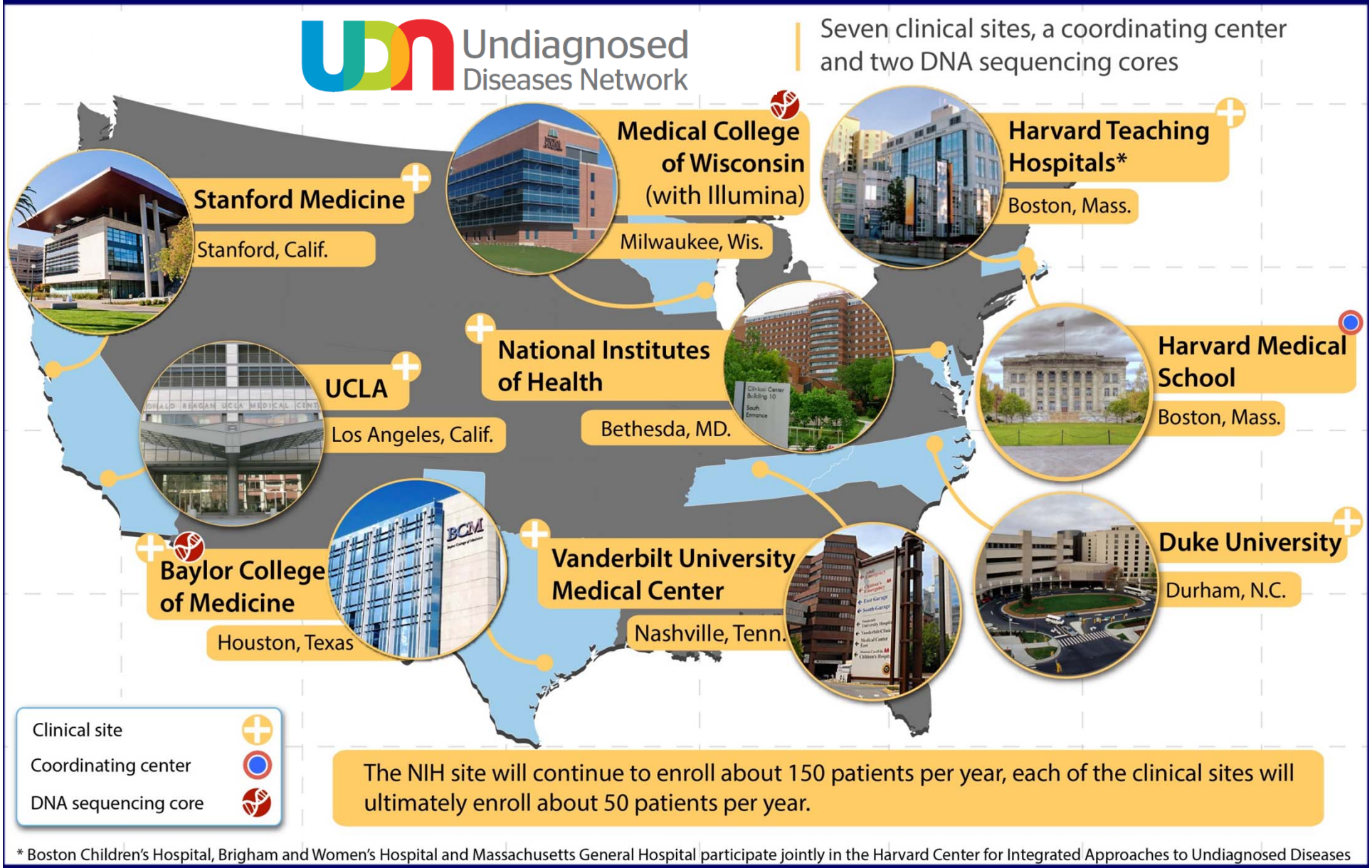
- Six investigator-initiated LINCS Data and Signature Generation Centers
- One NIH-initiated BD2K- LINCS Data Coordination and Integration Center
- First trans-LINCS meeting in October
- Data/tools release milestones for all centers developed
- Collaborative data science research opportunity announcement published

H3Africa

- 5th Consortium Meeting in November (Tanzania)
  - Grant Writing Workshop
  - Study Coordinators Session
  - Sickle Cell Disease Workshop
- Supplement for whole-genome sequencing
- Progress on developing custom genotyping chip
- Supplement for research ethics training
- 6th Consortium Meeting in May (Zambia)

Document 54

Undiagnosed Diseases Network (UDN)



* Boston Children's Hospital, Brigham and Women's Hospital and Massachusetts General Hospital participate jointly in the Harvard Center for Integrated Approaches to Undiagnosed Diseases

Undiagnosed Diseases Network (UDN)

PI Name	Gene	Model	Patient Phenotype
Worley	*FRMPD4*	mouse, human male cohort	developmental delay and regression, seizures
Lin	*HK1*, *SUSD4*, *CCDC89*, and *BAI2*	zebrafish	neurodegeneration and spastic tetraplegia like syndrome
Antonellis	*GARS*, *AARS*, and *DARS*	yeast, cell culture, zebrafish	recessive disease phenotypes
Graham	*ATP1A3*, *SYNE1*, *SNAP29*, *ARHGAP22*, *KIF4B* and *XRN1*	patient primary fibroblasts, drosophila	neurological and/or metabolic phenotypes
Chen	50 genes	zebrafish	many
Slusarski	15 genes	zebrafish	epilepsy

Undiagnosed Diseases Network

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Document 55

Big Data to Knowledge (BD2K) Initiative

Funded BD2K Elements

- Centers of Excellence, Data Discovery Index Coordination Consortium, Short Courses, Open Educational Resources, Mentored Career Development
- Joint kickoff meeting in November

Recently Reviewed Elements

- Targeted Software Development
- Institutional Pre-Doctoral Training Programs

Future BD2K Efforts

- The Commons
- NIH Standards Information Resource
- Database Sustainability
- Training Coordination Center
- Diversity

Document 56

Genome Privacy Challenge

- **iDASH center and collaborators develop solutions to problems in data sharing and privacy protection**
- **2nd iDASH privacy challenge in March 2015**

  Challenge 1: Homomorphic encryption

  Challenge 2: Secure multiparty computing for secure genomic data analysis across institutions

Document 57

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Inter-Society Coordinating Committee for Practitioner Education in Genomics

COMMENTARY | Genetics inMedicine

The growing role of professional societies in educating clinicians in genomics

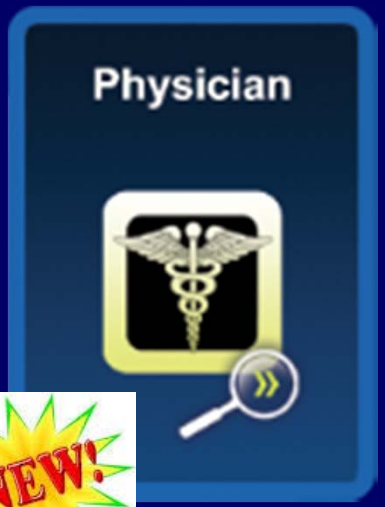
Teri A. Manolio, MD, PhD[1] and Michael F. Murray, MD[2]; for the Inter-Society Coordinating Committee for Practitioner Education in Genomics

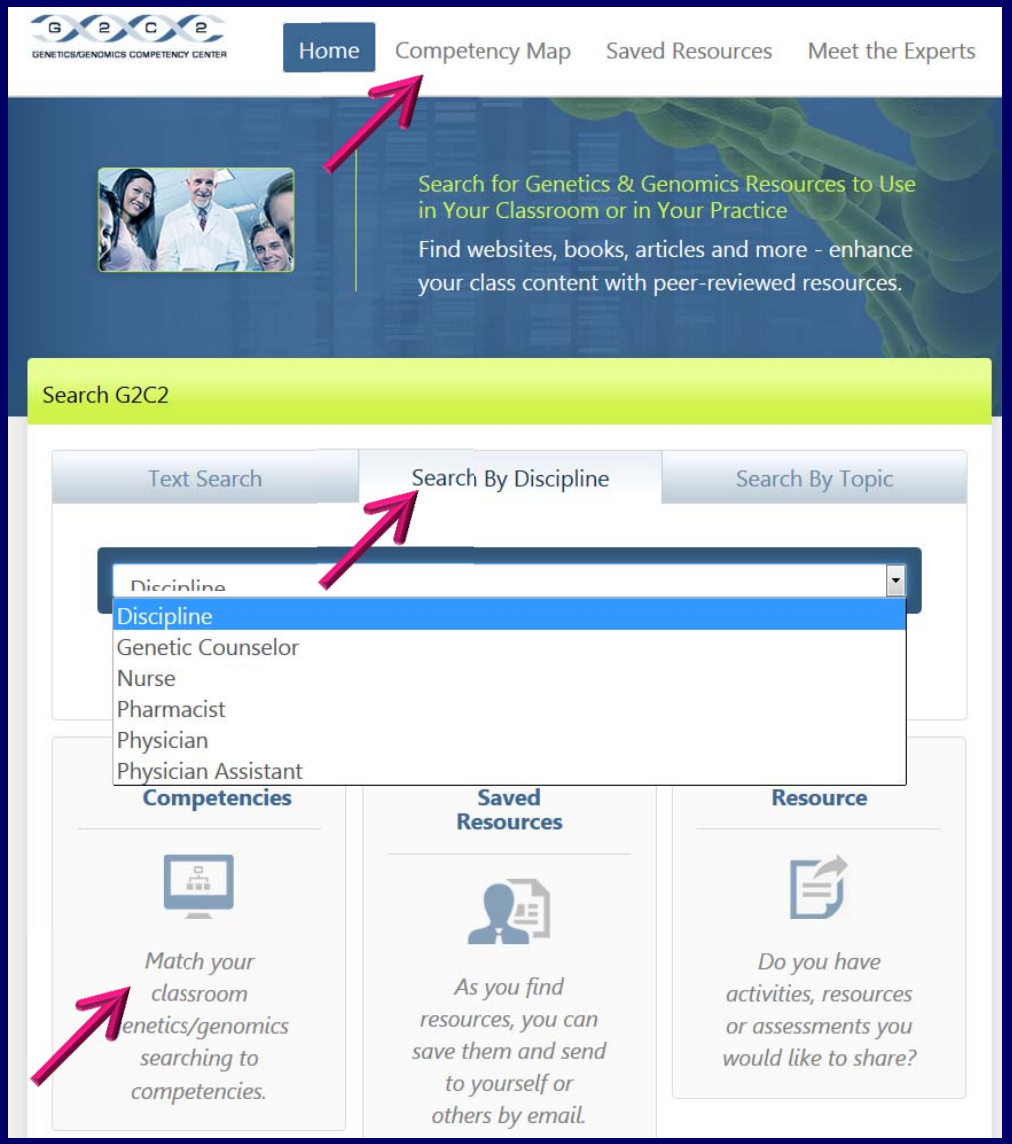
- Physicians and Dentists
- Pharmacists and Nurses
- Genetic Counselors

- In-person meeting in November 2014
- New working groups:
  - Physician-patient Communications
  - Innovative Approaches to Education

Document 58

Physician Resources Now on G2C2





Document 59

Newborn Screening Saves Lives Reauthorization Act of 2014

Document 60

Clinical Trials Policy Update

ClinicalTrials.gov
A service of the U.S. National Institutes of Health

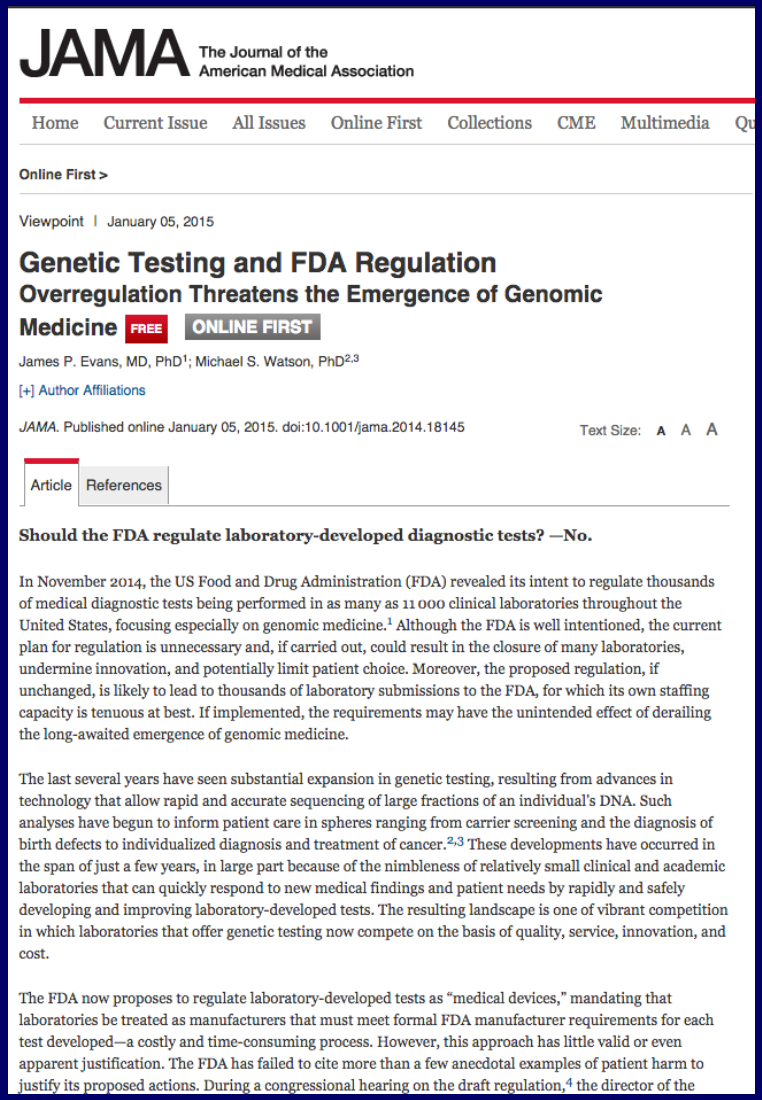
ClinicalTrials.gov is a registry and results database of publicly and privately supported clinical studies of human participants conducted around the world. Learn more about clinical studies and about this site, including relevant history, policies, and laws.

Now Available for Public Comment: Notice of Proposed Rulemaking (NPRM) for FDAAA 801 and NIH Draft Reporting Policy for NIH-Funded Trials

- New definition of “clinical trial”
- Reporting requirements
- Centralized Institutional Review Boards (IRBs)

Document 61

FDA Lab-Developed Test (LDT) Guidance



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Viewpoint | January 05, 2015

Genetic Testing and FDA Regulation

Overregulation Threatens the Emergence of Genomic Medicine FREE ONLINE FIRST

James P. Evans, MD, PhD[1]; Michael S. Watson, PhD[2,3]

[+] Author Affiliations

JAMA. Published online January 05, 2015. doi:10.1001/jama.2014.18145

Text Size: A A A

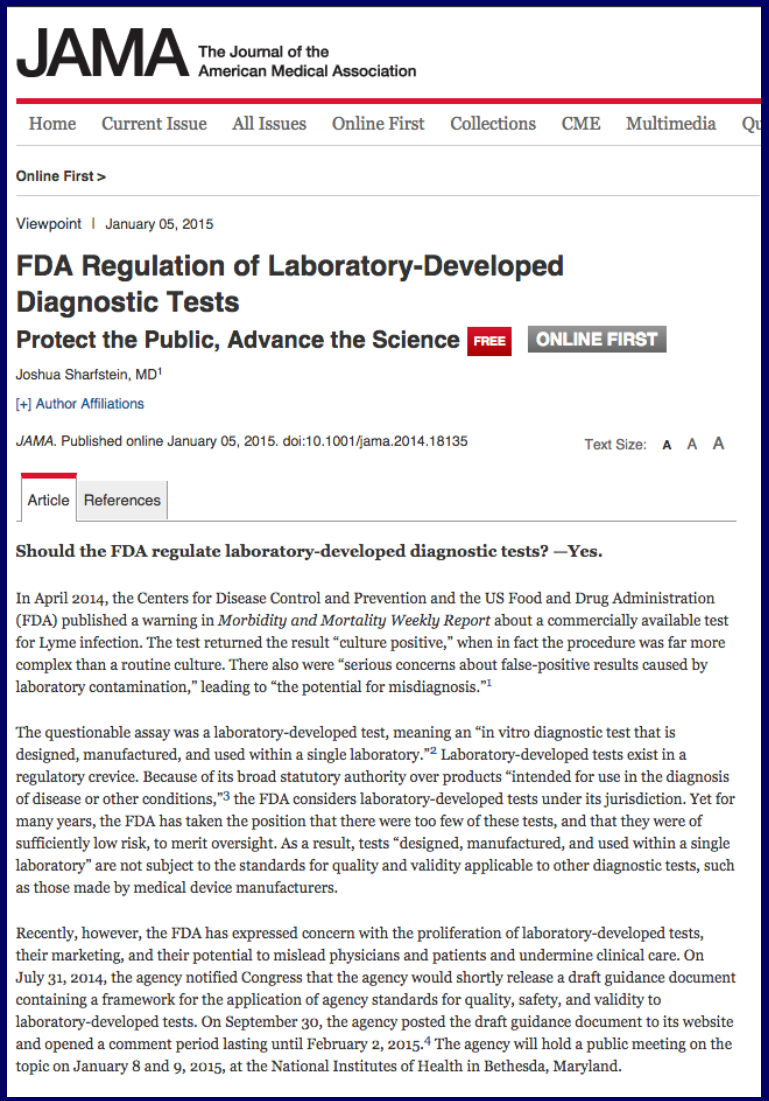
Article References

Should the FDA regulate laboratory-developed diagnostic tests? —No.

In November 2014, the US Food and Drug Administration (FDA) revealed its intent to regulate thousands of medical diagnostic tests being performed in as many as 11 000 clinical laboratories throughout the United States, focusing especially on genomic medicine.[1] Although the FDA is well intentioned, the current plan for regulation is unnecessary and, if carried out, could result in the closure of many laboratories, undermine innovation, and potentially limit patient choice. Moreover, the proposed regulation, if unchanged, is likely to lead to thousands of laboratory submissions to the FDA, for which its own staffing capacity is tenuous at best. If implemented, the requirements may have the unintended effect of derailing the long-awaited emergence of genomic medicine.

The last several years have seen substantial expansion in genetic testing, resulting from advances in technology that allow rapid and accurate sequencing of large fractions of an individual's DNA. Such analyses have begun to inform patient care in spheres ranging from carrier screening and the diagnosis of birth defects to individualized diagnosis and treatment of cancer.[2,3] These developments have occurred in the span of just a few years, in large part because of the nimbleness of relatively small clinical and academic laboratories that can quickly respond to new medical findings and patient needs by rapidly and safely developing and improving laboratory-developed tests. The resulting landscape is one of vibrant competition in which laboratories that offer genetic testing now compete on the basis of quality, service, innovation, and cost.

The FDA now proposes to regulate laboratory-developed tests as "medical devices," mandating that laboratories be treated as manufacturers that must meet formal FDA manufacturer requirements for each test developed—a costly and time-consuming process. However, this approach has little valid or even apparent justification. The FDA has failed to cite more than a few anecdotal examples of patient harm to justify its proposed actions. During a congressional hearing on the draft regulation,[4] the director of the



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Viewpoint | January 05, 2015

FDA Regulation of Laboratory-Developed Diagnostic Tests

Protect the Public, Advance the Science FREE ONLINE FIRST

Joshua Sharfstein, MD[1]

[+] Author Affiliations

JAMA. Published online January 05, 2015. doi:10.1001/jama.2014.18135

Text Size: A A A

Article References

Should the FDA regulate laboratory-developed diagnostic tests? —Yes.

In April 2014, the Centers for Disease Control and Prevention and the US Food and Drug Administration (FDA) published a warning in *Morbidity and Mortality Weekly Report* about a commercially available test for Lyme infection. The test returned the result "culture positive," when in fact the procedure was far more complex than a routine culture. There also were "serious concerns about false-positive results caused by laboratory contamination," leading to "the potential for misdiagnosis."[1]

The questionable assay was a laboratory-developed test, meaning an "in vitro diagnostic test that is designed, manufactured, and used within a single laboratory."[2] Laboratory-developed tests exist in a regulatory crevice. Because of its broad statutory authority over products "intended for use in the diagnosis of disease or other conditions,"[3] the FDA considers laboratory-developed tests under its jurisdiction. Yet for many years, the FDA has taken the position that there were too few of these tests, and that they were of sufficiently low risk, to merit oversight. As a result, tests "designed, manufactured, and used within a single laboratory" are not subject to the standards for quality and validity applicable to other diagnostic tests, such as those made by medical device manufacturers.

Recently, however, the FDA has expressed concern with the proliferation of laboratory-developed tests, their marketing, and their potential to mislead physicians and patients and undermine clinical care. On July 31, 2014, the agency notified Congress that the agency would shortly release a draft guidance document containing a framework for the application of agency standards for quality, safety, and validity to laboratory-developed tests. On September 30, the agency posted the draft guidance document to its website and opened a comment period lasting until February 2, 2015.[4] The agency will hold a public meeting on the topic on January 8 and 9, 2015, at the National Institutes of Health in Bethesda, Maryland.

Document 62

FDA Workshop on Oversight of 'Next-Generation' Genome Sequencing

Public Workshop: Optimizing FDA's Regulatory Oversight of Next-Generation Sequencing Diagnostic Tests

February 20, 2015

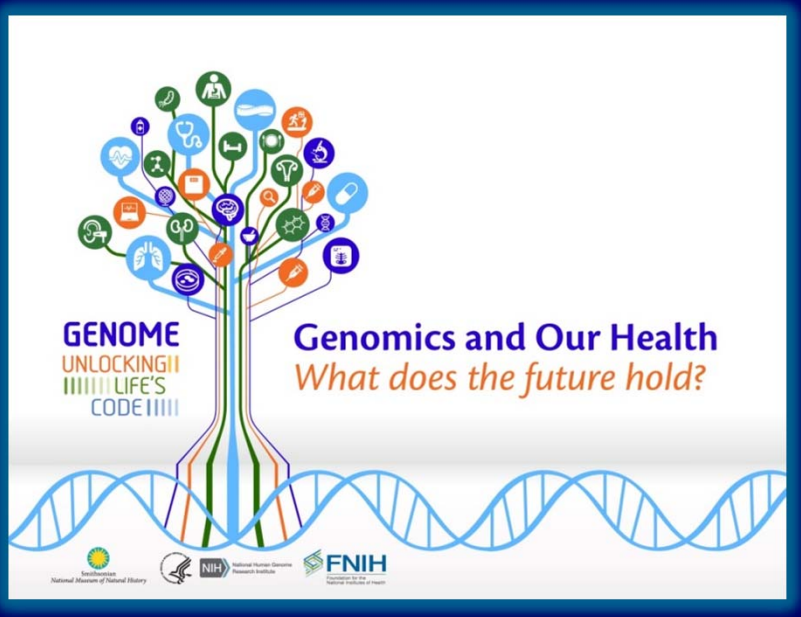
Document 62

Informed Consent Resource for Genomics

- Discussion of topics essential to genomics research
- Sample language and consent forms
- Relevant regulations and policies
- Email: informedconsent@mail.nih.gov

Document 63

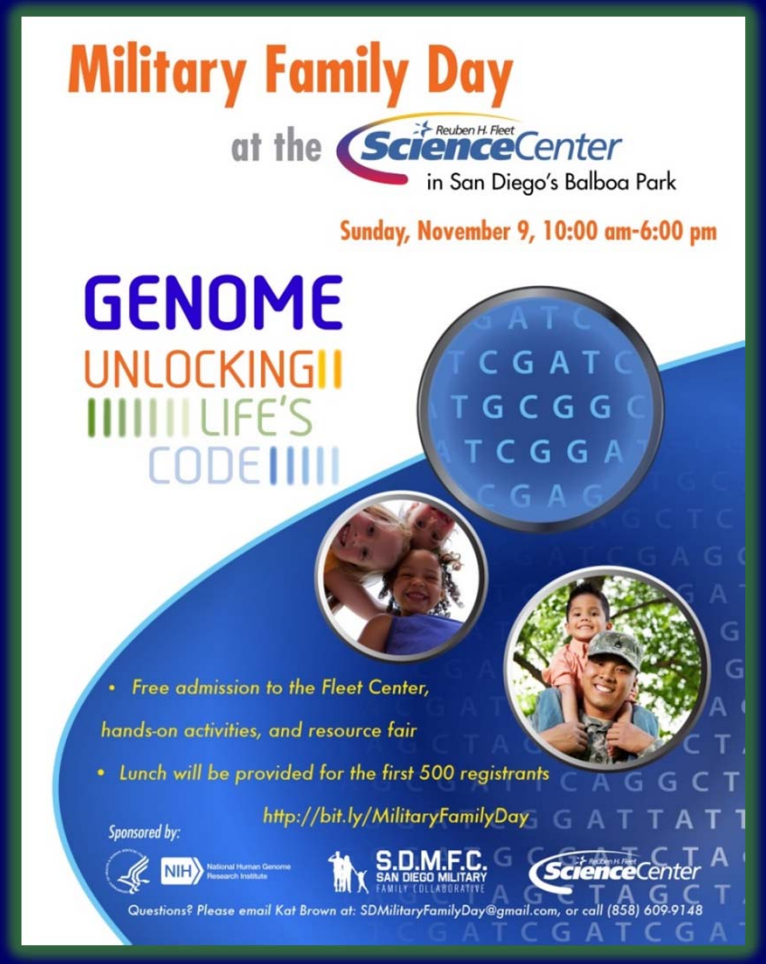
Genome: Unlocking Life's Code Exhibition
Closing Symposium



Document 64

Genome: Unlocking Life's Code Exhibition

Military Family Day



Document 64

Genome: Unlocking Life's Code Exhibition

Travel Schedule

2015

January 22-April 27:
The Tech Museum of Innovation
San Jose, CA

May 15-September 10
The Saint Louis Science Center
St. Louis, MO

October 2-January 3
Oregon Museum of Science and Industry
Portland, OR

2016

January 18-April 25
Discovery World Milwaukee
Milwaukee, WI

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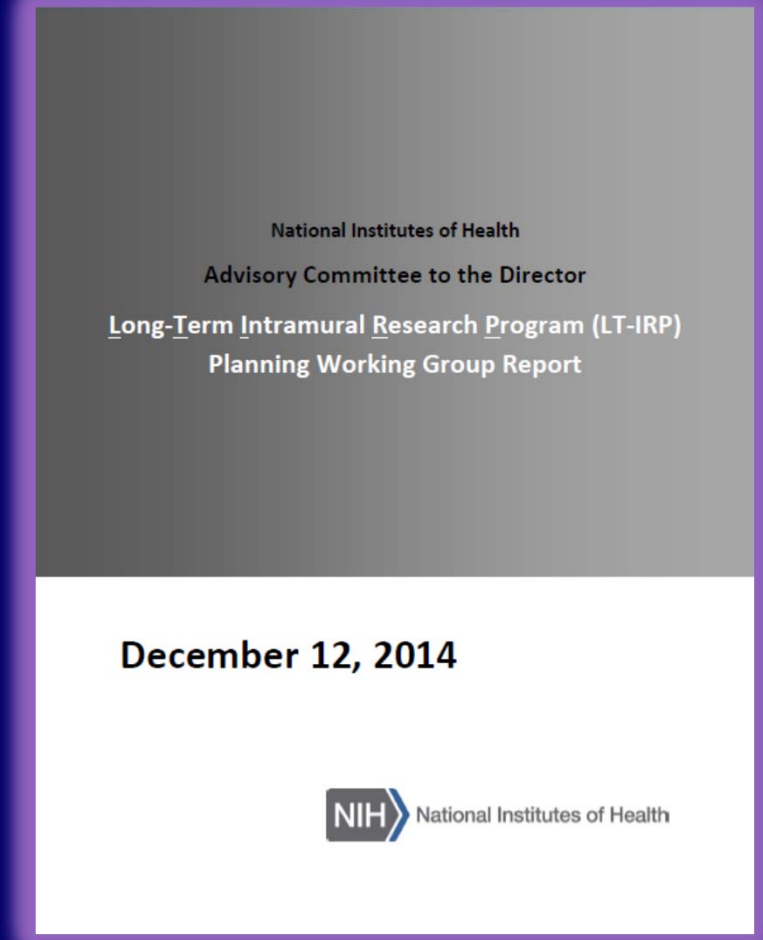
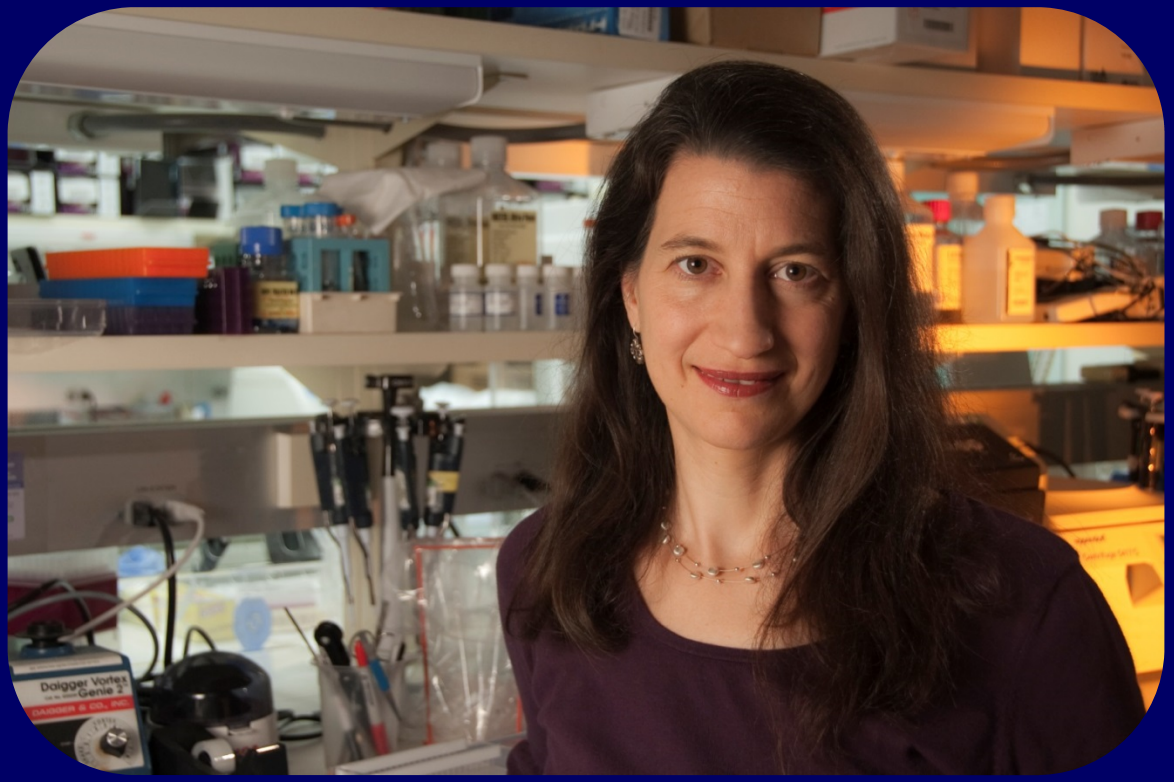
Report of the NIH Intramural Research Program Working Group



NIH Intramural

Document 65

2014 CHANEL-CERIES Research Award



Julie Segre, Ph.D.

Document 66

2014 Rare Voice Award

William A. Gahl, M.D., Ph.D.

Document 67

2014 NSGC Leadership Award

Natalie Weissberger Paul National Achievement Award

Barbara B. Biesecker, M.S., Ph.D., C.G.C.

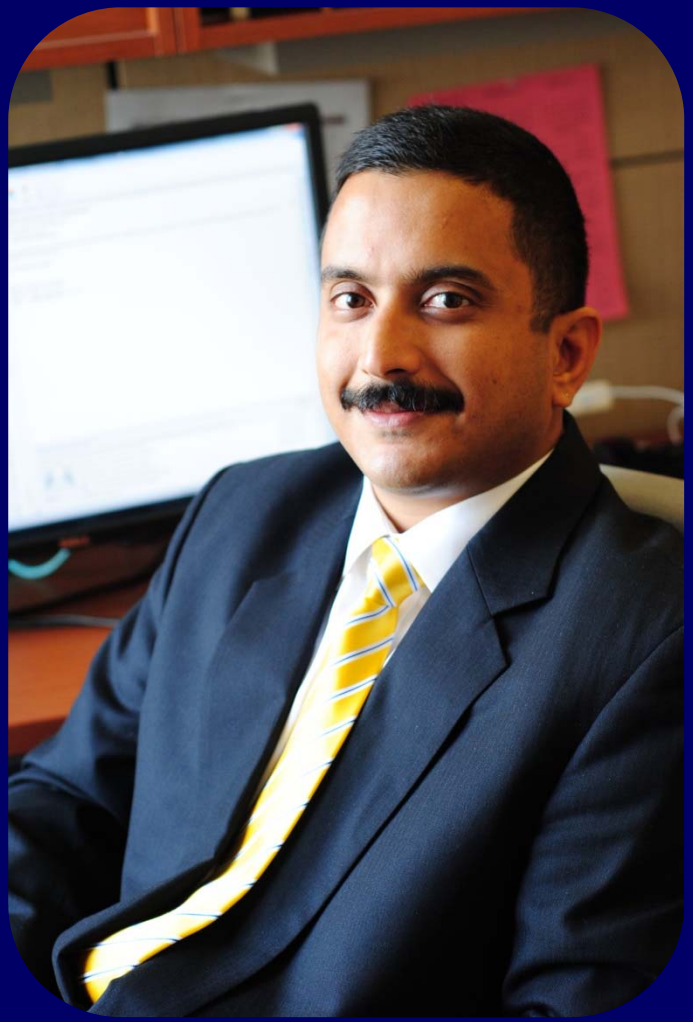
Document 68

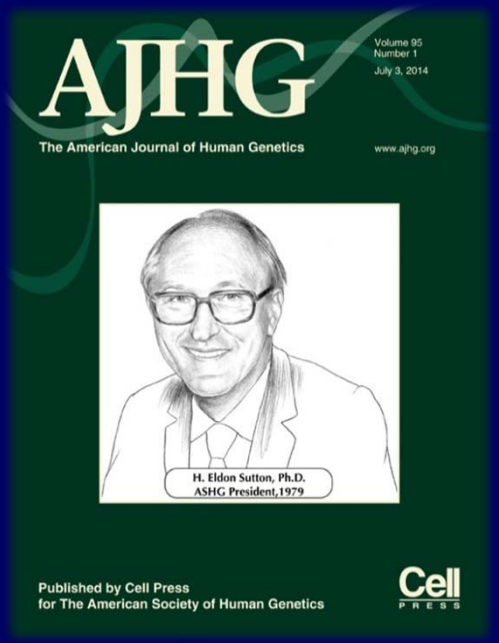
2014 South African Medical Research Council Scientific Merit Award

Charles Rotimi, Ph.D.

Document 69

2014 AJHG C.W. Cotterman Award





Shurjo Sen, Ph.D.

Document 70

NHGRI Intramural Research Highlights

nature International weekly journal of science

The African Genome Variation Project shapes medical genetics in Africa

nature International weekly journal of science

Biogeography and individuality shape function in the human skin metagenome

JCI The Journal of Clinical Investigation

Vector design influences hepatic genotoxicity after adeno-associated virus gene therapy

The Genomics Landscape

A monthly update from the NHGRI Director

To receive *The Genomics Landscape*, go to list.nih.gov

Search for NHGRILANDSCAPE

Past issues can be accessed at: genome.gov/27527308

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

Thanks!

Special Thanks!