

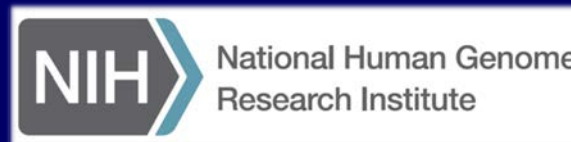
# Future Opportunities for Genome Sequencing... and Beyond



## Wrap-Up

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



**I warned you!!!**



**The discussion has been vigorous!**



**Of interest—**

**what I didn't hear...**



**Sink NHGRI's flagship!**

# NHGRI Genome Sequencing Program: Characteristics (To Date)

Large (i.e., Scale)

Consortia-oriented

Highly managed

Resource-generating

'Technology'-advancing

Scientifically/medically relevant

Timble

**Change these characteristics!**

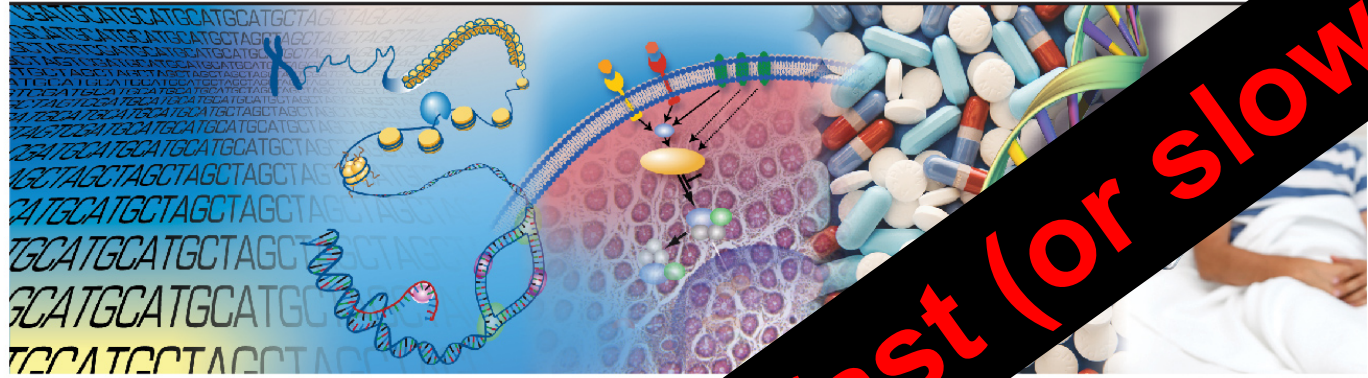
Understanding  
the Structure of  
Genomes

Understanding  
the Biology of  
Genomes

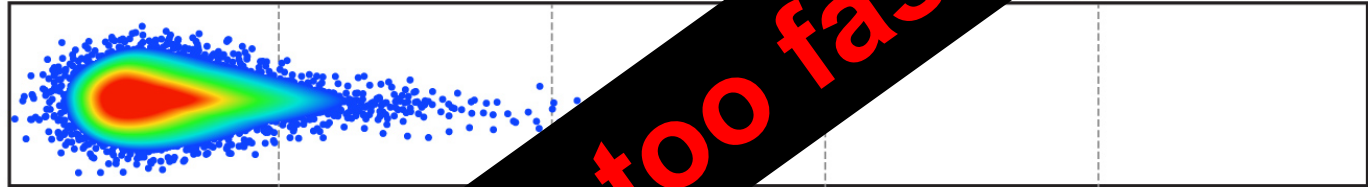
Understanding  
the Biology of  
Disease

Advancing  
the Science of  
Medicine

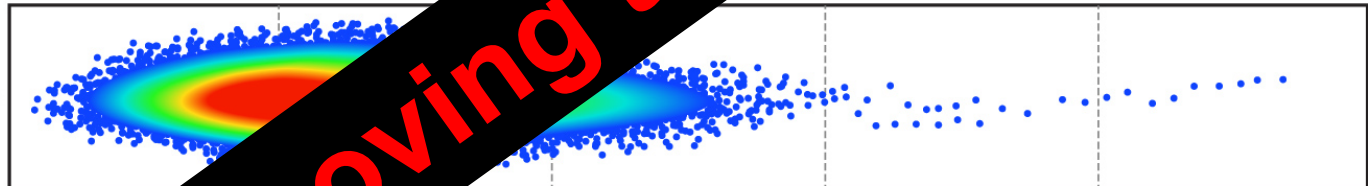
Improving the  
Effectiveness of  
Healthcare



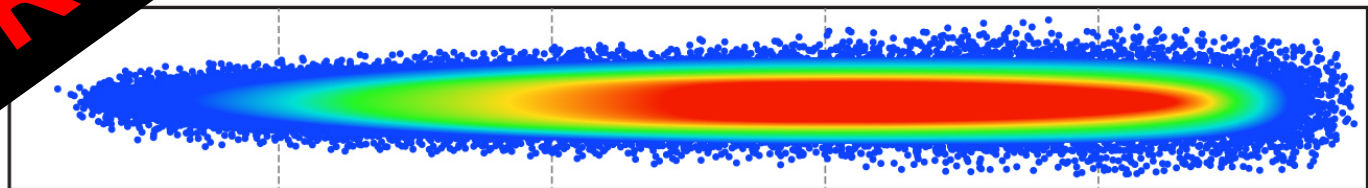
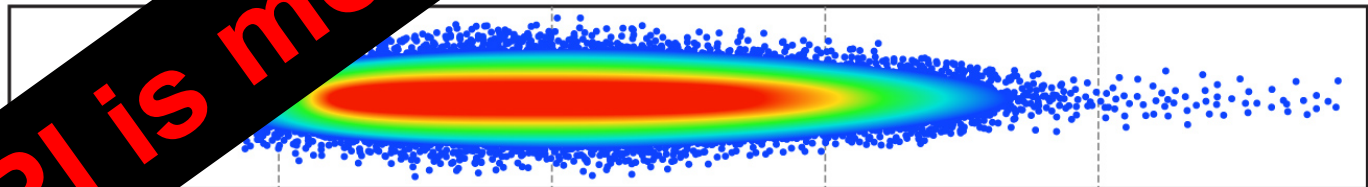
1990-2003  
Human Genome Project



2004-2010



2011-2020



**NHGRI is moving too fast (or slow)!**

# Going Forward: What Does NHGRI Want?

- Continue being 'genomics trailblazer'
- Alignment with strategic vision
- Impact that correlates with program size
- If continuation of a program, then retain 7 characteristics (previous slide)
- Importance of 'building on' past initial catalytic investments (e.g., organism sequencing, microbial microbiome, and cancer)
- Increased 'cost-sharing' to broaden impact

**NHGRI has the wrong 'wants'!**



# NHGRI and Cost-Sharing

- Genomics = Huge; NHGRI = Small
- NHGRI cannot support 'existing genomics'
- Partnerships are key (past and future)
- Consider forming an approach for cost-sharing large-scale NHGRI-funded genomics projects

**Cost-sharing won't work!**

# **What will keep me up at night...**

- 1. “NHGRI Leadership is Critical”**
- 2. Blurring among NHGRI programs (flagship and otherwise)**
- 3. Defining NHGRI’s external boundaries is getting harder (not easier!)**
- 4. Budgetary climate is frustrating**
- 5. “Other NIH Institutes don’t know how to do this well... and Eric G needs to tell them”**
- 6. Brokering ‘deals’ at NIH (and beyond)**

# Why I am profoundly optimistic...

1. The scientific/medical opportunities are spectacular
2. Terrific ideas emerged from this workshop
3. There is flattering confidence in NHGRI
4. There appears to be optimism about new cost-sharing models (and maybe the budgetary situation more generally?)
5. Things we were criticized for a few years ago we are now being complimented about
6. Basic-clinical debate much less shrill

Post-HGP  
Planning

Program Review  
Workshop

Program Review  
Workshop

Program Review  
Workshop



~2002

2005

2009

2014



2003

2006

2012

2016

Human  
Genome  
Project

“Large-Scale  
Genome  
Sequencing  
Centers”

“Large-Scale  
Genome  
Sequencing  
Centers”

4-Component  
“Genome  
Sequencing  
Program”

To Be  
Determined

1990-2003

2003-2006

2006-2011

2012-2015

2016-???



Comparative Genomics

Microbiome

HapMap Project

1000 Genomes

Cancer Genomics (TSP, TCGA)

Medical Sequencing

Pathogens & Vectors

Common Diseases

???

Mendelian Diseases

???

Clinical Genomics

???

Computational Tools

???





# NATIONAL HUMAN GENOME RESEARCH INSTITUTE



***Advancing human health  
through genomics research***