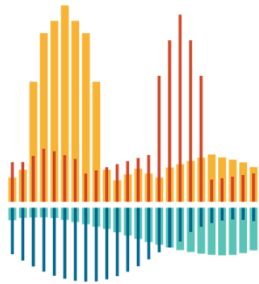


GENOMIC DISCOVERY, COLLABORATION, AND TRANSLATION USING ELECTRONIC HEALTH RECORDS



INSTITUTE FOR
COMPUTATIONAL
BIOLOGY

October 30, 2015

Dana C. Crawford, PhD

Associate Professor

Epidemiology and Biostatistics

Institute for Computational Biology



Precision Medicine

A New Initiative

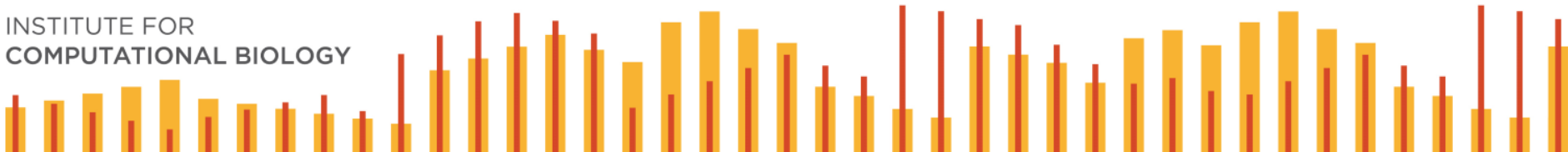


Lancet 385:2448-2449 (2015)

- Launched January 20, 2015
- 2016 budget of \$215M



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Precision Medicine

The Concept



RELAX
AND BE
PATIENT

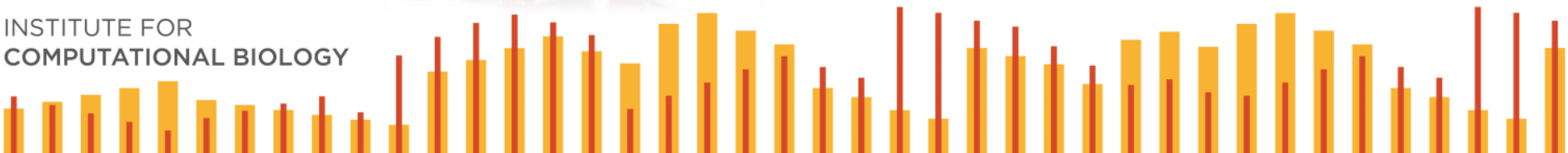
Right Patient

Right Drug



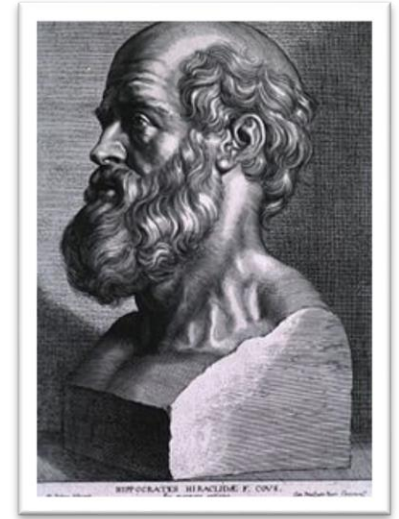
Right Dose

First Time



Precision Medicine

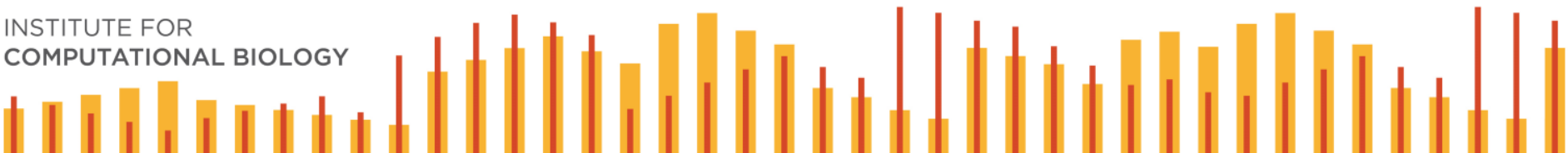
The Concept



<https://en.wikipedia.org/wiki/Hippocrates>

- AKA Personalized Medicine
- Not a new concept

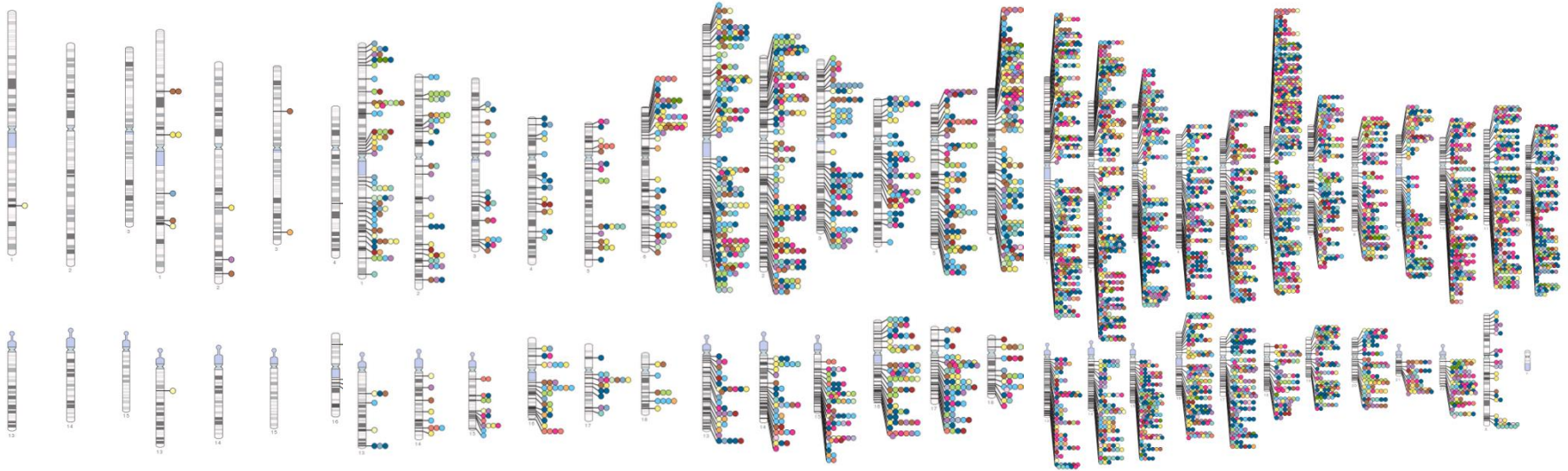
It's far more important to know what person the disease has than what disease the person has. – Hippocrates (c. 460 – c. 370 BC)



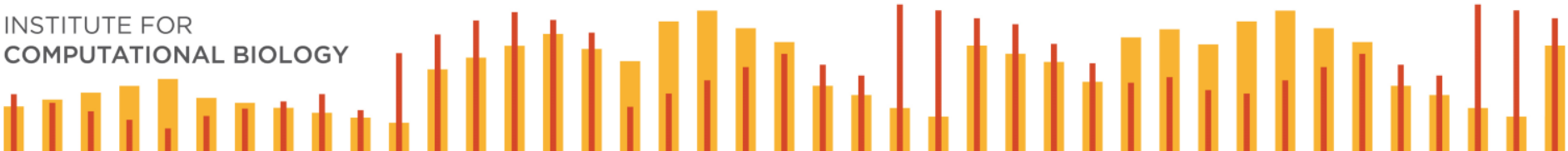
Precision Medicine

The Concept

Accelerated Genomic Discovery



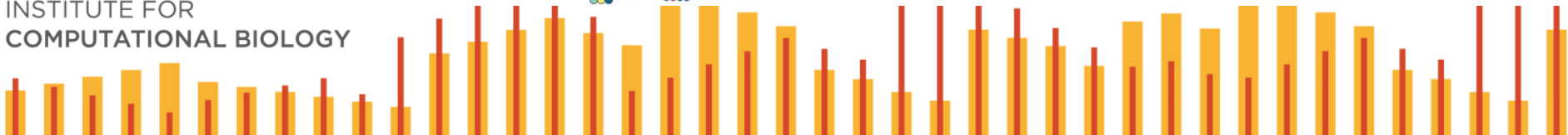
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GWAS as of 2015:

2,111 publications

15,396 associated
SNPs (10^{-5})

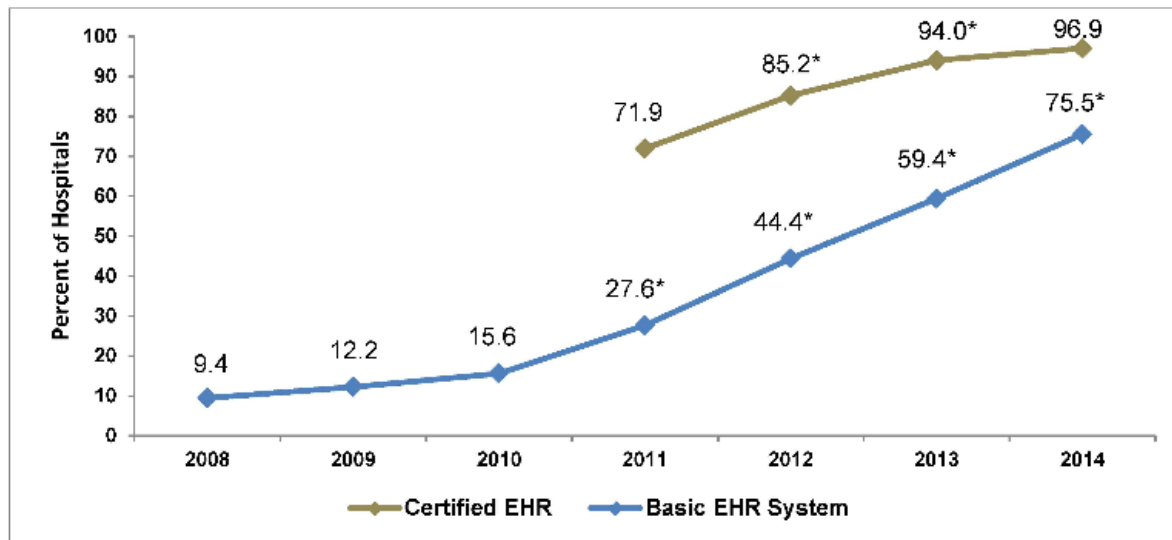


Precision Medicine

The Concept



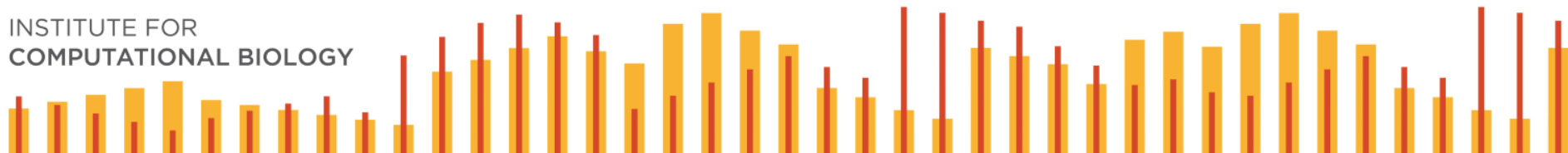
Figure 1: Percent of non-Federal acute care hospitals with adoption of at least a Basic EHR with notes system and possession of a certified EHR: 2008-2014



From <https://www.healthit.gov/sites/default/files/data-brief/2014HospitalAdoptionDataBrief.pdf>

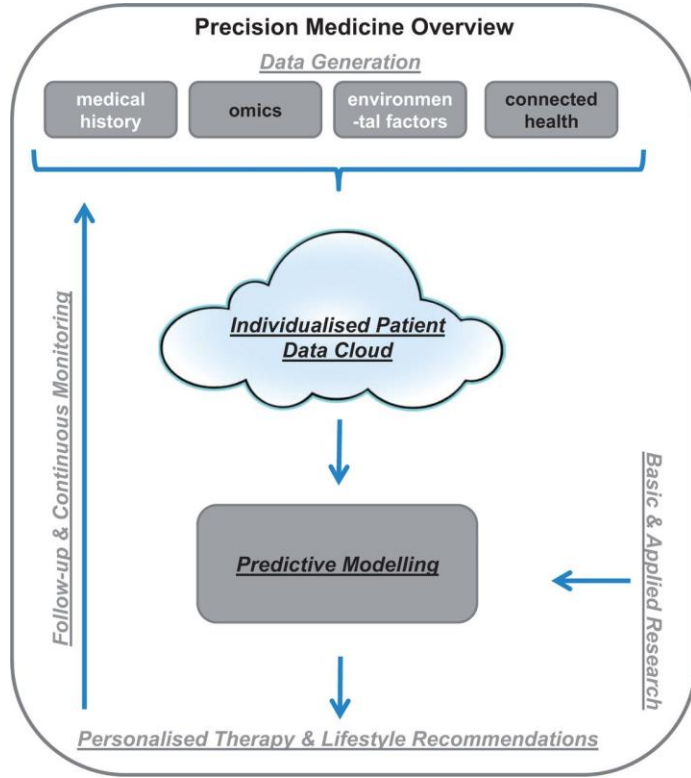
The rapid rise of EHRs:

As of 2014, 3 out of 4 US hospitals have at least a basic EHR

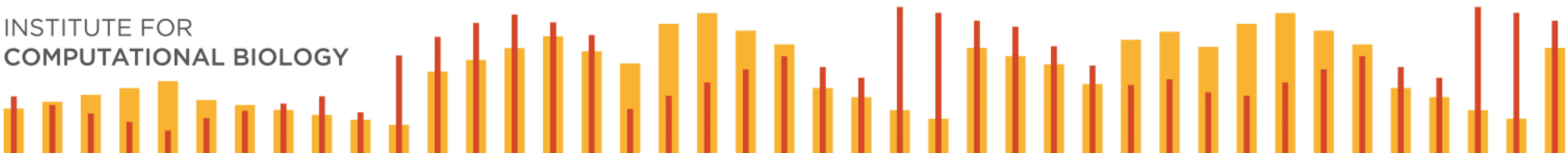


Precision Medicine

The Concept



Duffy DJ *Brief Bioinform* (in press)



Session Speakers



EHRs and Research Possibilities

William S. Bush, PhD, MS
Case Western Reserve University



EHRs and Precision Medicine: A Test Case

Janina M. Jeff, PhD, MS
Mount Sinai



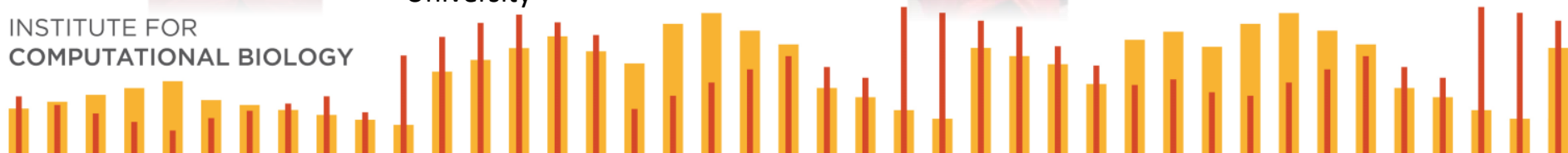
Interdisciplinary Collaborations and EHRs: The Electronic Medical Records and Genomics (eMERGE) Network

Dana C. Crawford, PhD
Case Western Reserve University



EHRs and Genomic Discovery: Phenome-wide Association Studies and Other Adventures in Pleiotropy

Sarah A. Pendergrass, PhD, MS
Geisinger



Q&A Topics

EHRs

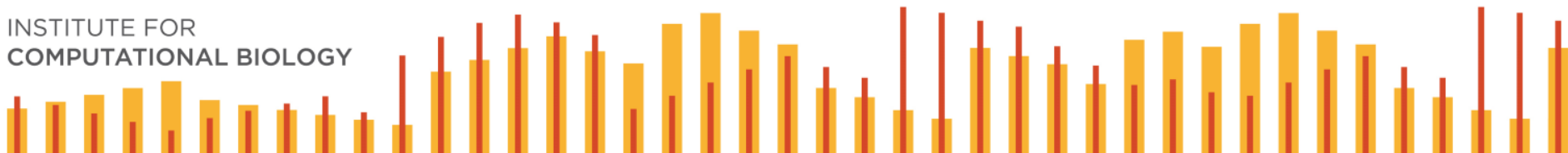
Electronic Phenotyping

Precision Medicine

Precision Medicine Initiative

Pharmacogenomics

PheWAS



Q&A Topics

Careers

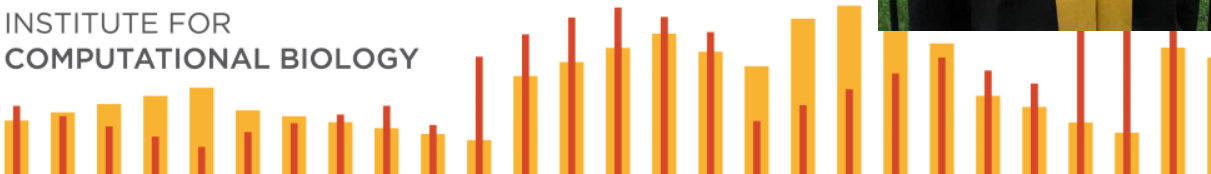
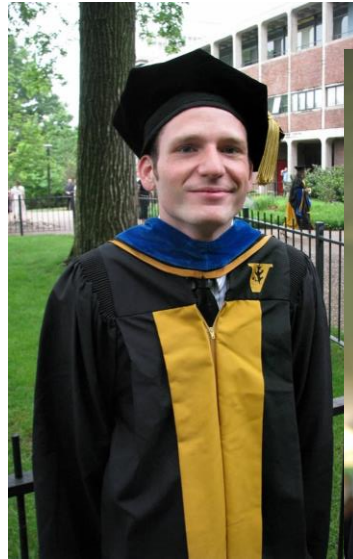
Degrees

Disciplines

Collaborations

Colleagues

Friends



Q&A Topics



Big Data and Disease
JNU, New Delhi, India



ABRCMS
Nashville, TN



Pacific Symposium on
Biocomputing
Big Island, Hawaii

