

University of Massachusetts and
New England Area Librarian *E-
Science Symposium*

A Health Sciences Perspective

Neil Rambo

7 April 2010

eScience + biomedicine =

???

eScience + biomedicine =

Informatics?

eScience + biomedicine =

(Production) Informatics?

eScience + biomedicine =

Bioinformatics

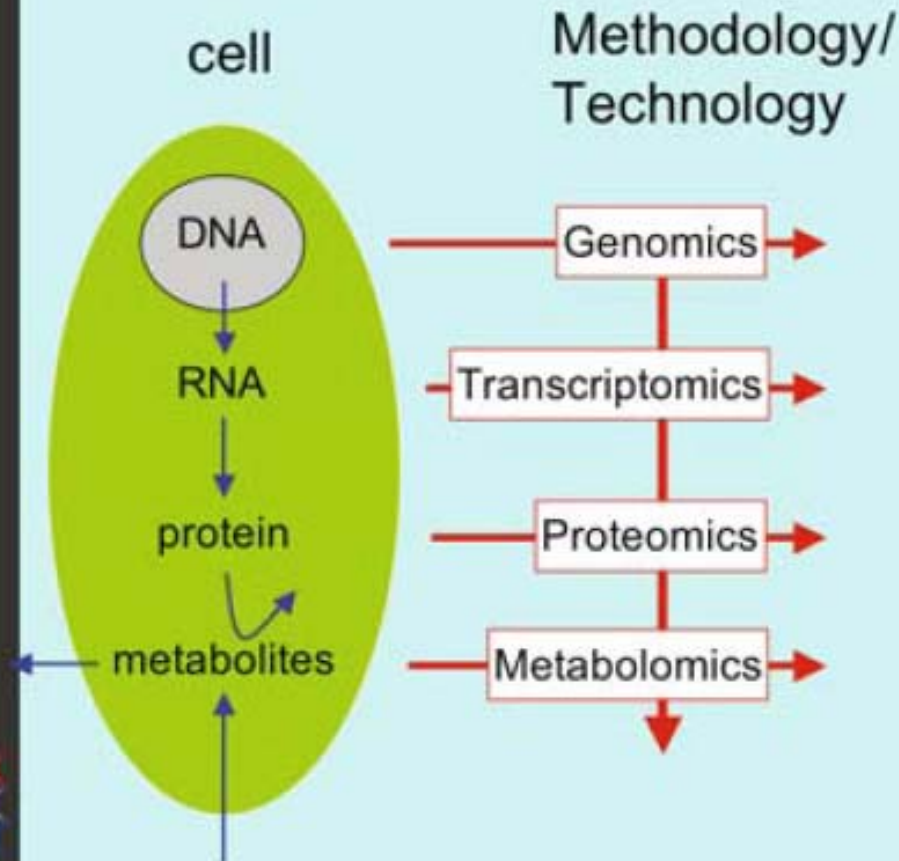
Biotechnology

eScience + biomedicine =

Bioinformatics / Biotechnology

-Omics?

New technologies in Life Sciences research



University of Amsterdam

Fig. 1. Omics methods in life sciences

Table 1. Some examples of the application data crisis

medical imaging (fMRI):	~ 1 GByte per measurement (day)
Bio-informatics queries:	~ 500 GByte per database
Satellite world imagery:	~ 5 TByte/year
Current particle physics:	~ 1 PByte per year
Future particle physics):	~ 10-30 PByte per year

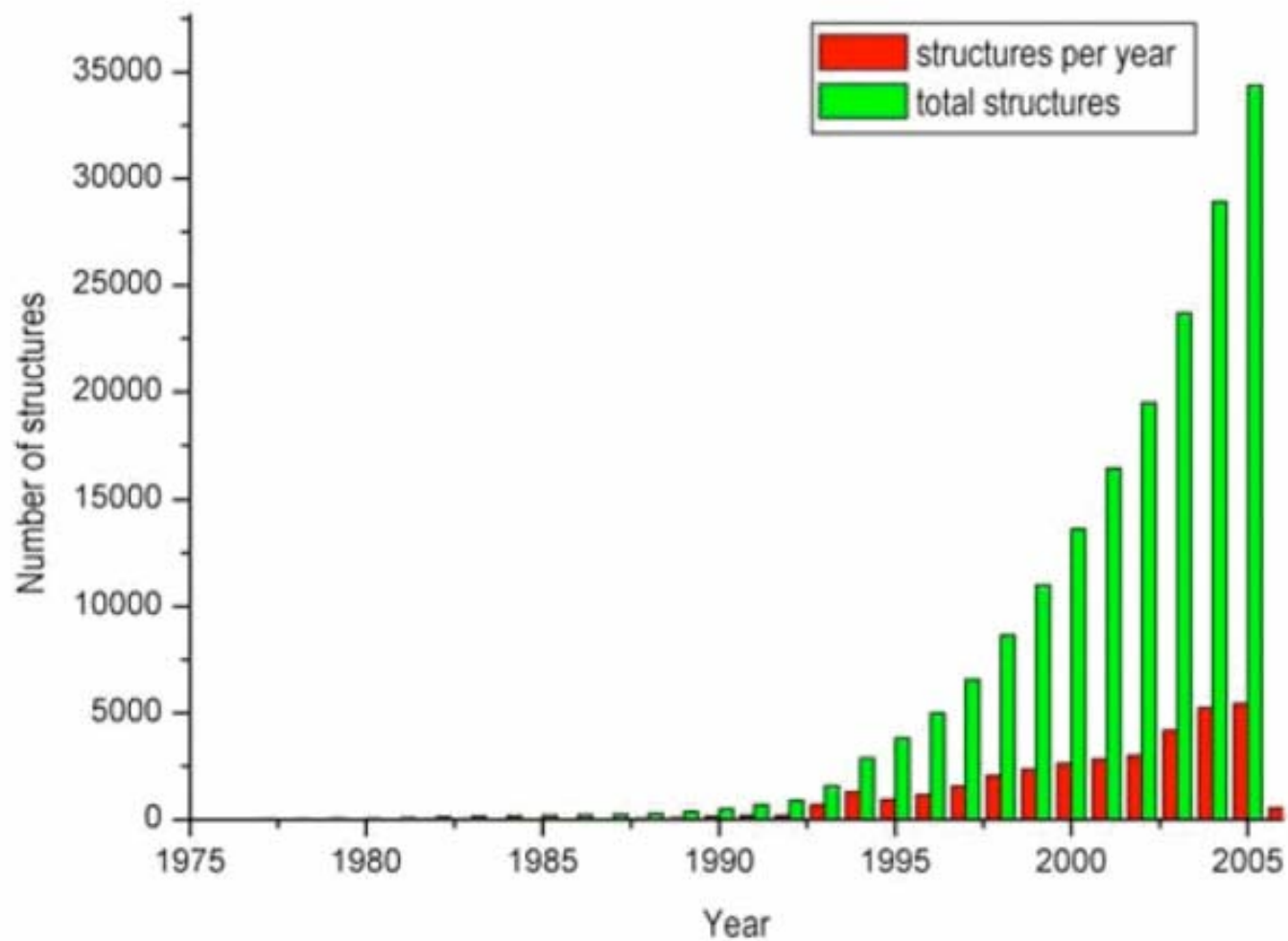


Figure 2.

Growth of the total number of structures in the RCSB/PDB data base (Kouranov et al., 2006). The exponential growth follows the same pattern of [Fig 1](#).

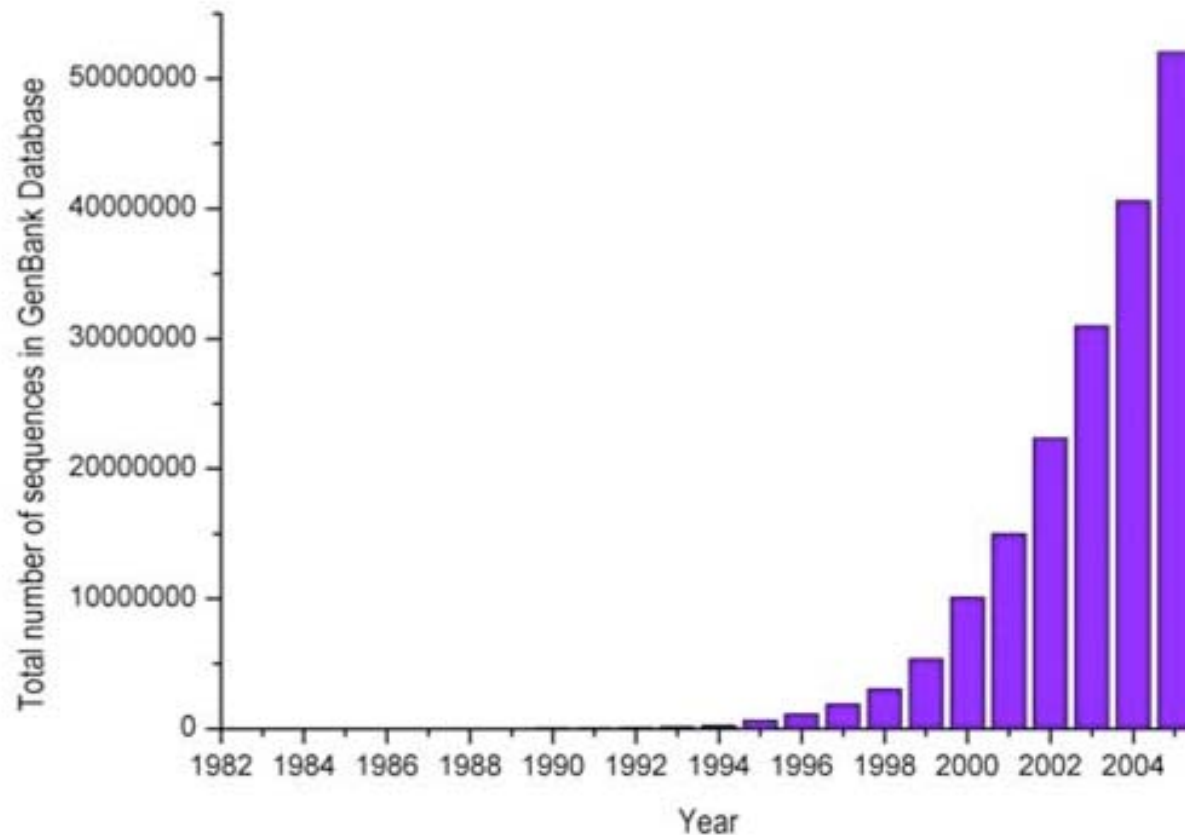


Figure 1.

Number of sequences available in the GenBank as of December 15, 2005. The biological data explosion in mid 90's can be easily seen with the exponential growth from 1995. For a detailed description of the complete data set, please see <http://www.ncbi.nlm.nih.gov/Genbank/genbankstats.html>.

"There will be increasing reasons for each of us to have our complete genomes determined and placed in medical files," Collins noted.

"Five years after that, there will be compelling enough evidence that **this is good medicine for both prevention and treatment that third parties will cover the cost," Collins said. "Health-care providers will have immediate access to [this information] about you, about what decisions to recommend. It's not one-size-fits-all, but really just about you."**

"When I was in training, genetics was a small insignificant subspecialty of pediatrics," Marion noted. "And now pediatrics is a small insignificant subspecialty of genetics."



National Center for
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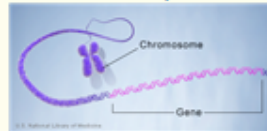
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**Discover associations
among previously disparate data**

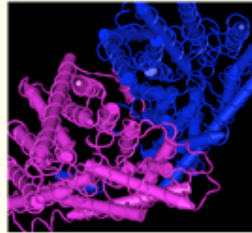
PubMed Literature



Entrez Nucleotide and
Protein Sequences



Entrez Structures



and more...

Various data types, such as literature, nucleotide and protein sequences, and three-dimensional structures, are often submitted to public databases independently of each other by different research groups. Yet these data are related through their coverage of the same topic via different research methods. The Structure group contributes to the broader NCBI effort to identify associations among previously disparate data. See an [example...](#)



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Sage Vision:

Create an open access, integrative bionetwork evolved by contributor scientists working to eliminate human disease

Sage Bionetworks is a new, not-for-profit medical research organization established in 2009 to revolutionize how researchers approach the complexity of human biological information and the treatment of disease. Sage's objectives are:

- to build and support an open access platform and databases for building innovative new dynamic disease models
- to interconnect scientists as contributors to evolving, integrated networks of biological data

Sage Bionetworks - 1100 Fairview Ave. N. - Seattle WA 98109



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Sage News Briefs

Sage and Merck begin cardiovascular and metabolic disease collaboration -[Media Release](#) -

NPR interview with Stephen Friend -[Link](#)-

Sage Commons Congress details on sagecongress.org

Sage Awarded New NCI Center for Cancer Systems Biology -[details](#)-

Pilot Repository Program testing open access to datasets and network models. -[more](#)-

Sage and Pfizer sign oncology partnership. -[more](#)-

Nature Reviews cites Sage as new R&D trend -[more](#) -

Sage President article on disruptive technologies. - [more](#) -

Sage Founders profiled in Forbes.com -[more](#) -

Quintiles has made a major donation to Sage. - [more](#) -



Institute for Health Metrics and Evaluation

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What we do

What you can do

Information Resources

MAP THE DATA



IHME'S GIS TOOL

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The Institute for Health Metrics and Evaluation (IHME) is an independent research center at the University of Washington rigorously measuring the world's most pressing health issues and providing scientific evaluations of health system and health program performance in order to guide health policy and accelerate global health progress.

Research Areas:

Health Outcomes

IHME is generating scientifically sound methods and systematic estimates of health outcomes – including mortality, causes of death, and overall burden of disease, injuries, and risk factors.

Health Services

We study how health services contribute to improving health outcomes by measuring the crude coverage of specific health interventions, as well as estimating the effectiveness of those interventions by integrating the concepts of need, utilization, and quality.

The Data Spot

PICK A SPOT - SAMPLE OUR STATS



Roles for HS Libraries/Librarians?

With current skill sets

- Metadata consulting
- Develop data management plans
- ...

Roles for HS Libraries/Librarians?

With current skill sets

- Metadata consulting
- Develop data management plans

With additional/advanced skill sets

- Data design, organization, management
- Data analysis, synthesis, meta-analysis
- Data repurposing
- ...

How do we go forward?

- It's a tough time to innovate and expand
- Most of us won't be doing this
- iSchools aren't responding adequately
 - Exceptions: UIUC, UNC
- Need to draw from other professions/training
 - Biostatistics, research methods, informatics
- Need to forge new, expanded partnerships

Onward. Thank you.