

GOALS OF PORTFOLIO ANALYSIS



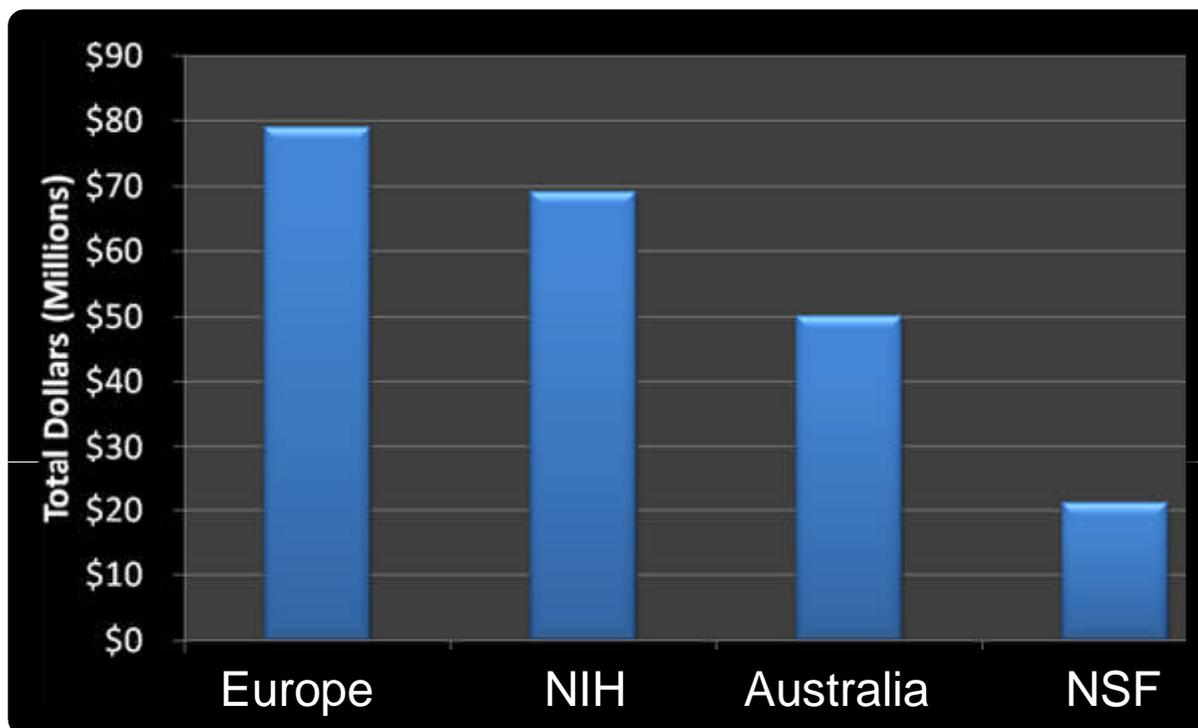
Using Portfolio Analysis to Set Priorities

Enhance RFA Development

- OPA evaluation of 38 Metabolomics Centers in the US, most of which receive funding from NIH
- These Centers have overlapping goals, yet operated in isolation with little coordination or collaboration
- Portfolio analysis shaped a new Metabolomics RFA aimed at improving coordination and leveraging existing resources



\$225M FY10 Global Investment in Metabolomics

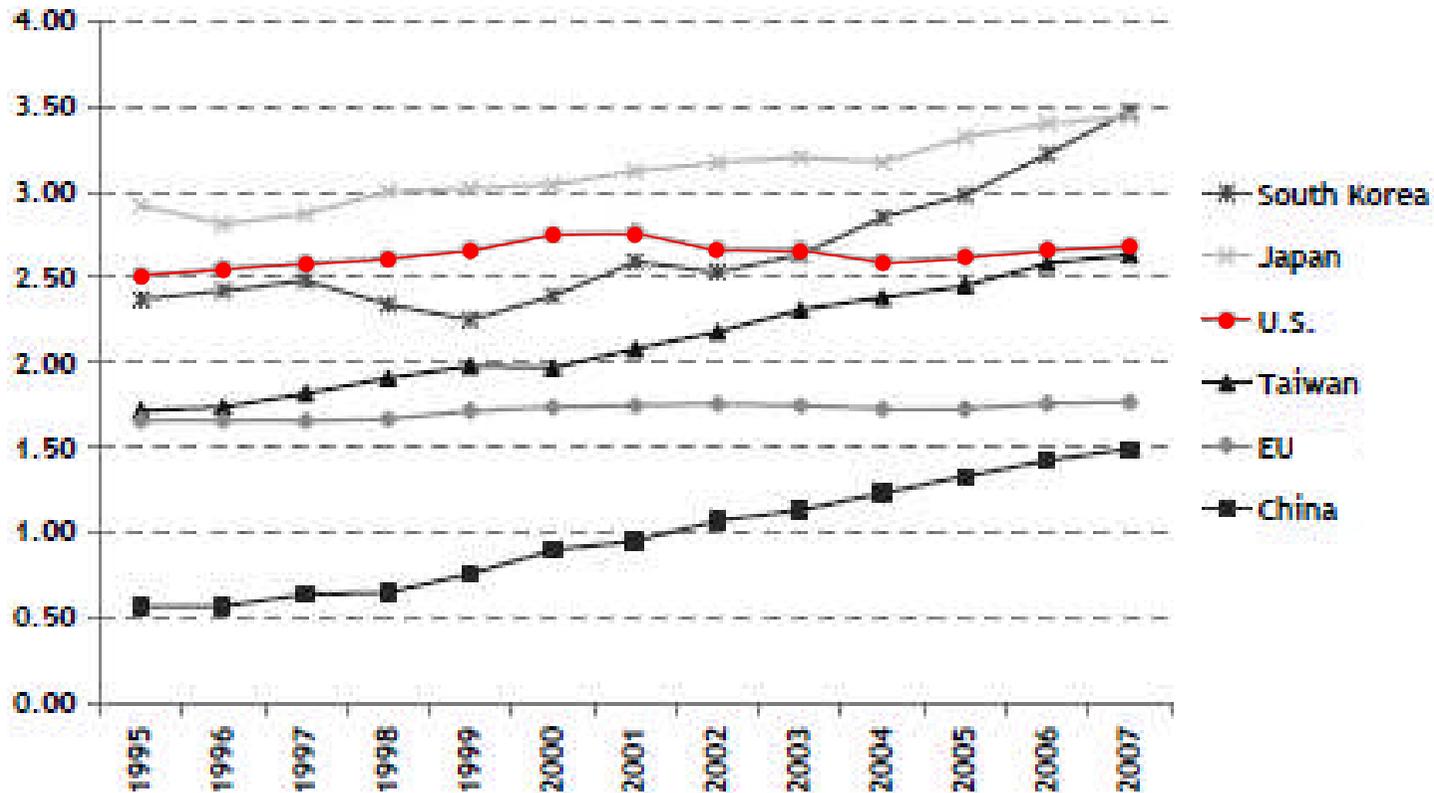


MAJOR INTERNATIONAL INVESTMENTS

- Netherlands Metabolomics Center
- BBSRC, UK Plant and Microbial Metabolomics
- Canadian Human Metabolome Database



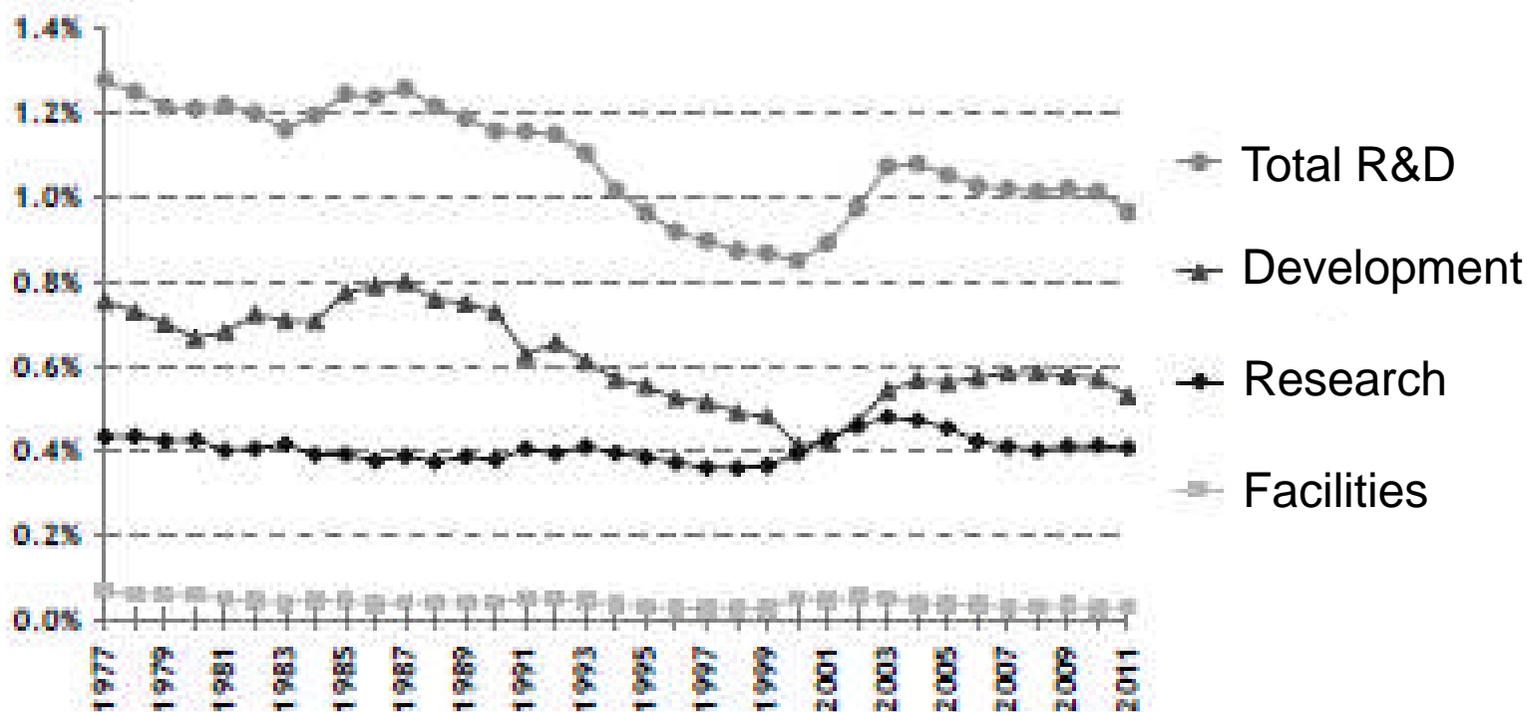
National R&D Investment as Percent of GDP



Source: OECD, Main Science and Technology Indicators, May 2009.
© 2010 AAAS



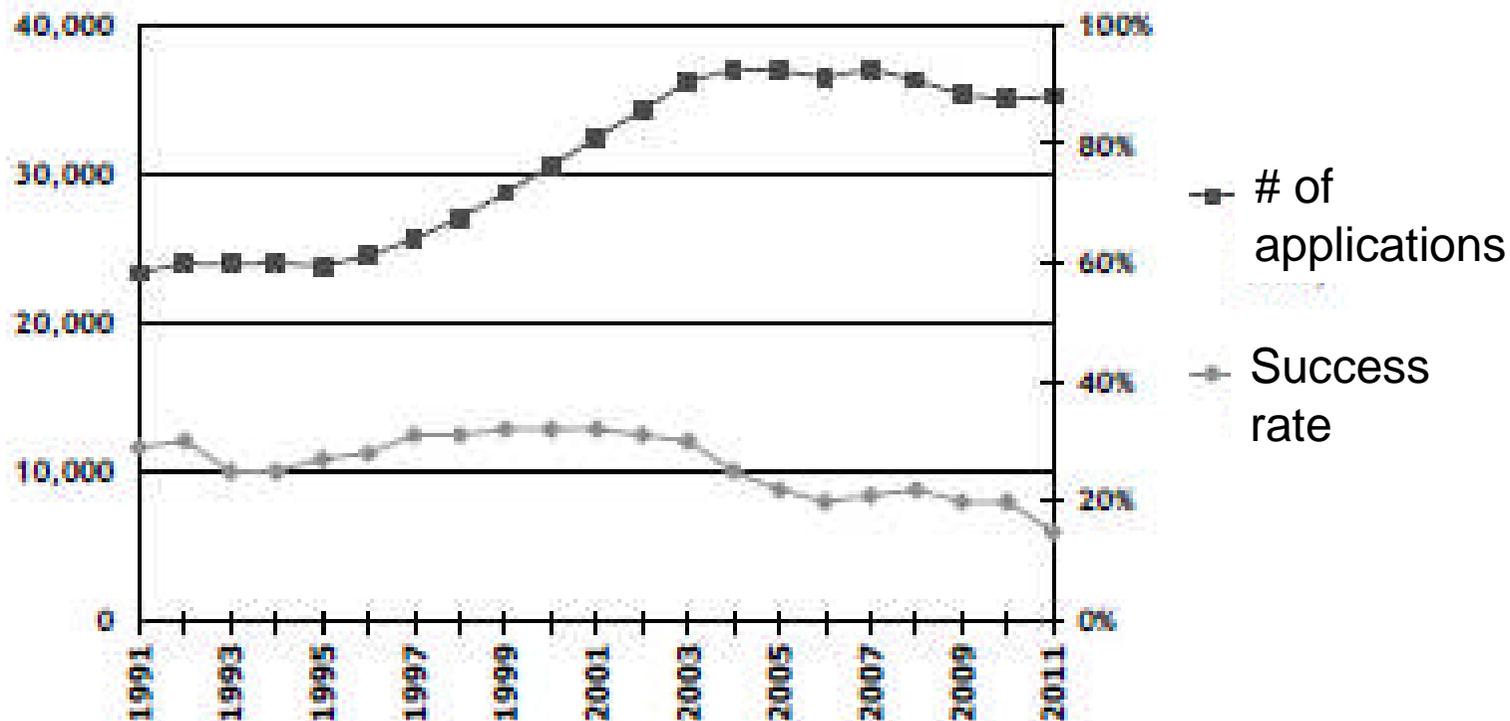
Trends in Federal R&D as Percent of GDP



Source: AAAS Report: *Research and Development series*.
 FY 2011 figures are latest AAAS estimates of the FY 2011 request.
 R&D includes conduct of R&D and R&D facilities.
 Data to 1984 are obligations from the NSF Federal Funds survey.
 GDP figures are from OMB, *Budget of the U.S. Government FY 2011*.
 © 2010 AAAS



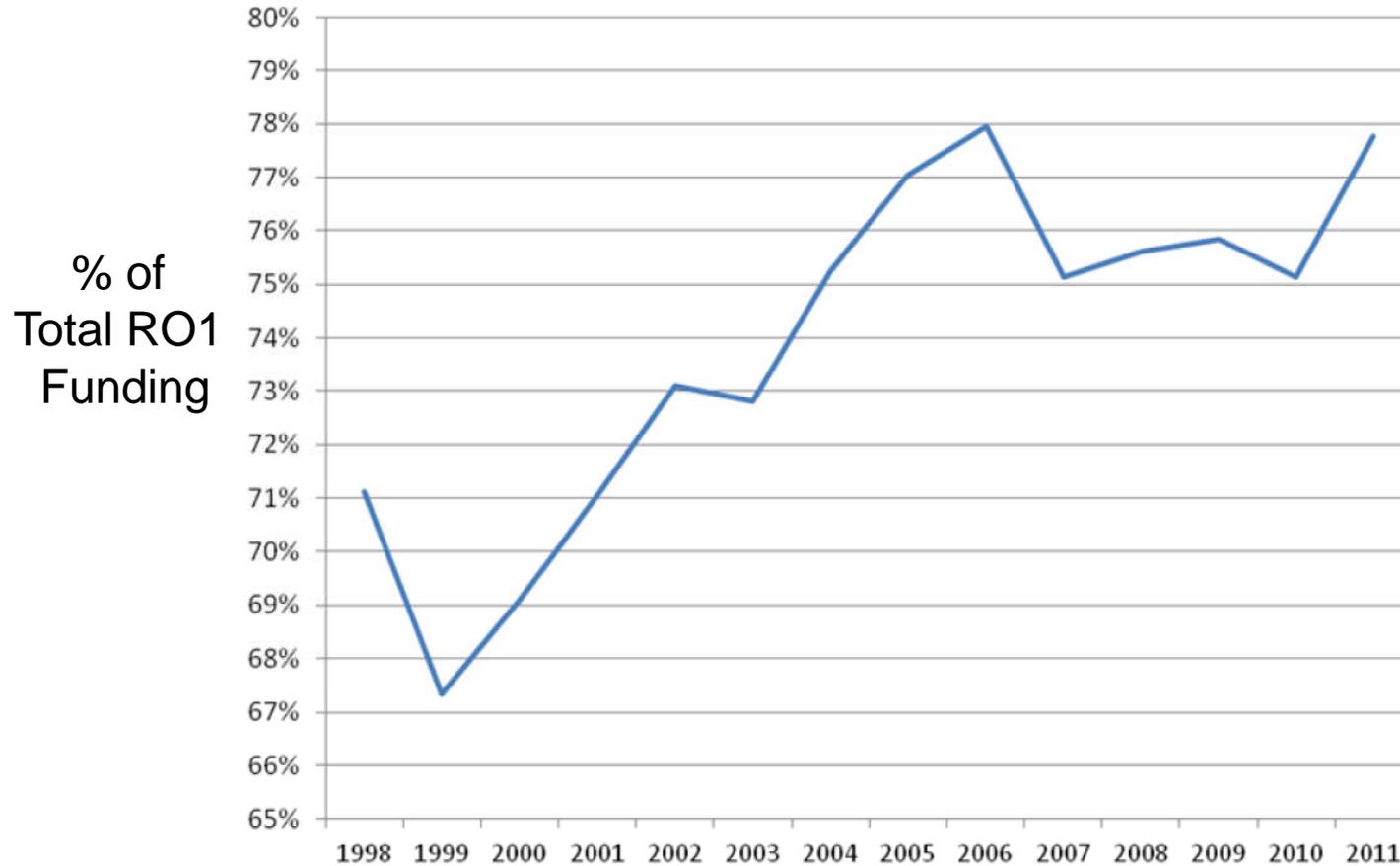
NIH Research Project Grants (RPGs)



Source: NIH agency budget justification.
SBIR/STTR Grants are not included for historical consistency.
© 2010 AAAS



NIH Non-Competing Commitments



The Office of Portfolio Analysis (OPA)

MISSION STATEMENT

- To enhance the impact of NIH-supported research by enabling NIH research administrators and decision makers to evaluate and prioritize current, as well as emerging, areas of research
- To advance knowledge and improve human health



The Office of Portfolio Analysis (OPA)

MISSION STATEMENT

- To innovate by identifying and developing new, sophisticated tools that expand and improve NIH-wide efforts in portfolio analysis
- To apply and disseminate both current and newly developed tools, including computational approaches, which are capable of analyzing a wide range of parameters of biomedical research funding and the resulting impact
- To promote trans-NIH coordination of portfolio analysis activities and enhance collaboration among all portfolio analysis stakeholders at NIH



Some OPA Goals

- Enhance and coordinate trans-NIH portfolio analysis activities
 - Centralized web-based repository to disseminate computational tools
 - http://dpcpsi.nih.gov/portfolio_analysis/
 - Computer lab to train NIH staff in the use of computational tools
 - Consultation on portfolio analysis projects
 - Standing trans-NIH Working Group
 - Portfolio Analysis Symposium (July 23-24, Natcher Conf. Ctr.)



More OPA Goals

- Encourage use of portfolio analysis as an input in NIH decision-making
- Identify overlap or gaps in funded research
- Identify emerging concepts, approaches, and/or fields of research
- Develop ways to measure impact

Some Current OPA Initiatives

- Unique tool development
 - Hierarchical clustering tool (CIT)
 - SVM classifier (CIT)
 - Semantic portfolio analyst (NLM)
 - Endeca data cube (will incorporate ten years of Thomson Reuters citation data)



More Current OPA Initiatives

- Participate in development of Common Fund projects
 - Exosomes
 - Disruptive Proteomics
 - Microbiome II

- Respond to requests from senior NIH leadership

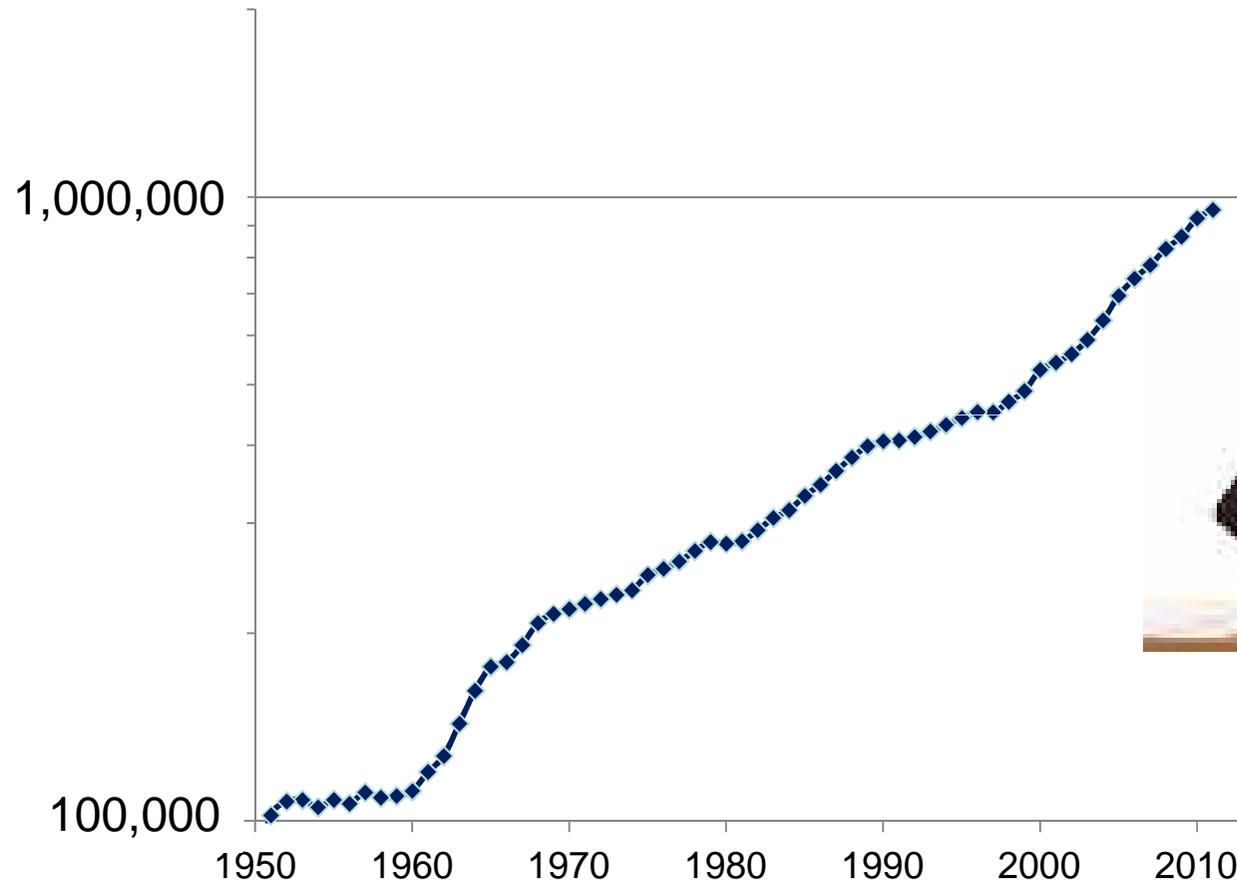


Goals of the Portfolio Analysis Workshop

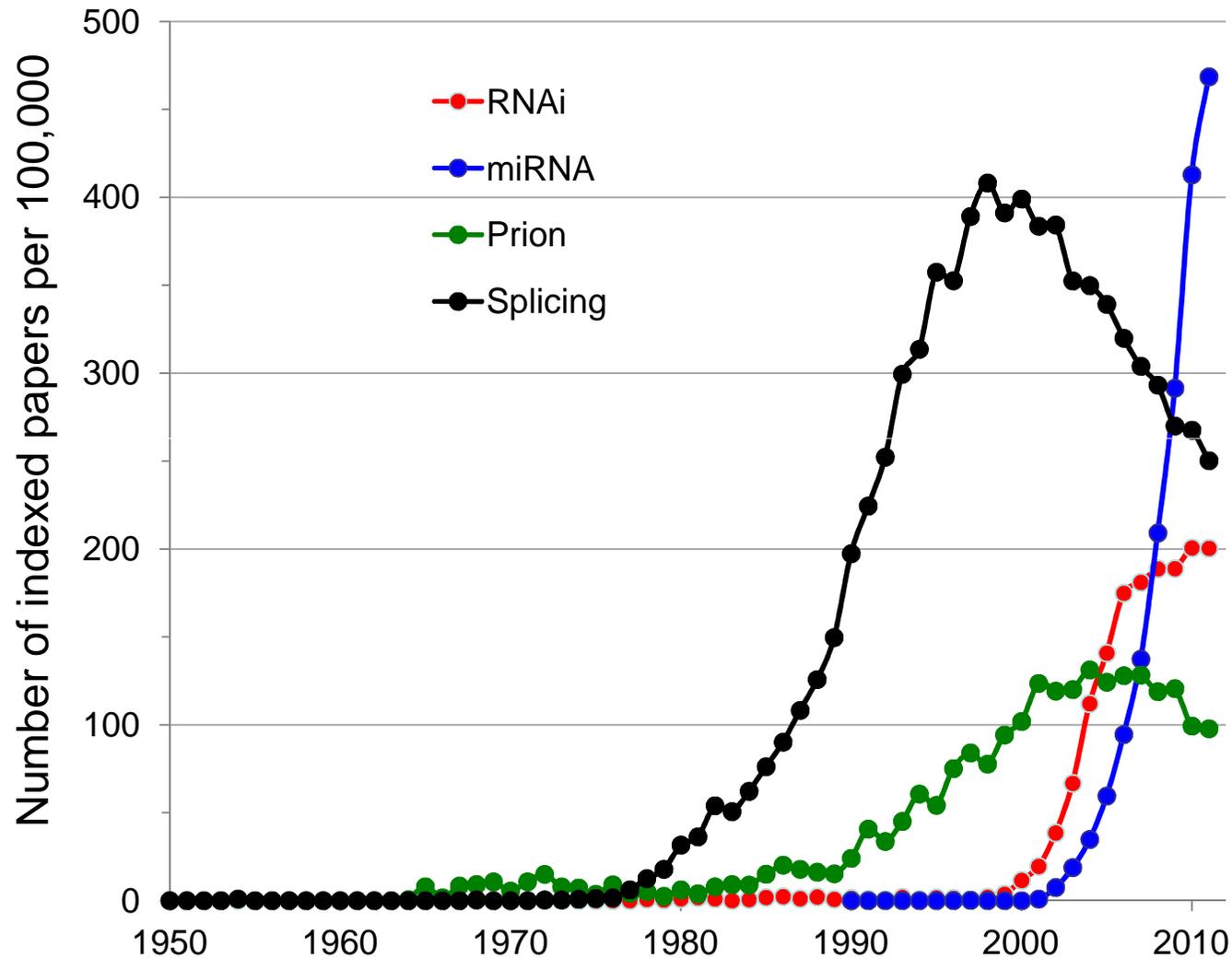
- Discuss perceived needs in portfolio analysis
- This Workshop will be used to determine NIH needs and identify outside experts for the Symposium (July 23-24, Natcher Conf. Ctr.)
- Topics we will discuss today include:
 - Strategic planning
 - Uses of portfolio analysis
 - Overlap in NIH portfolios
 - Measuring impact
 - New portfolio analysis tools
 - Identification of emerging areas



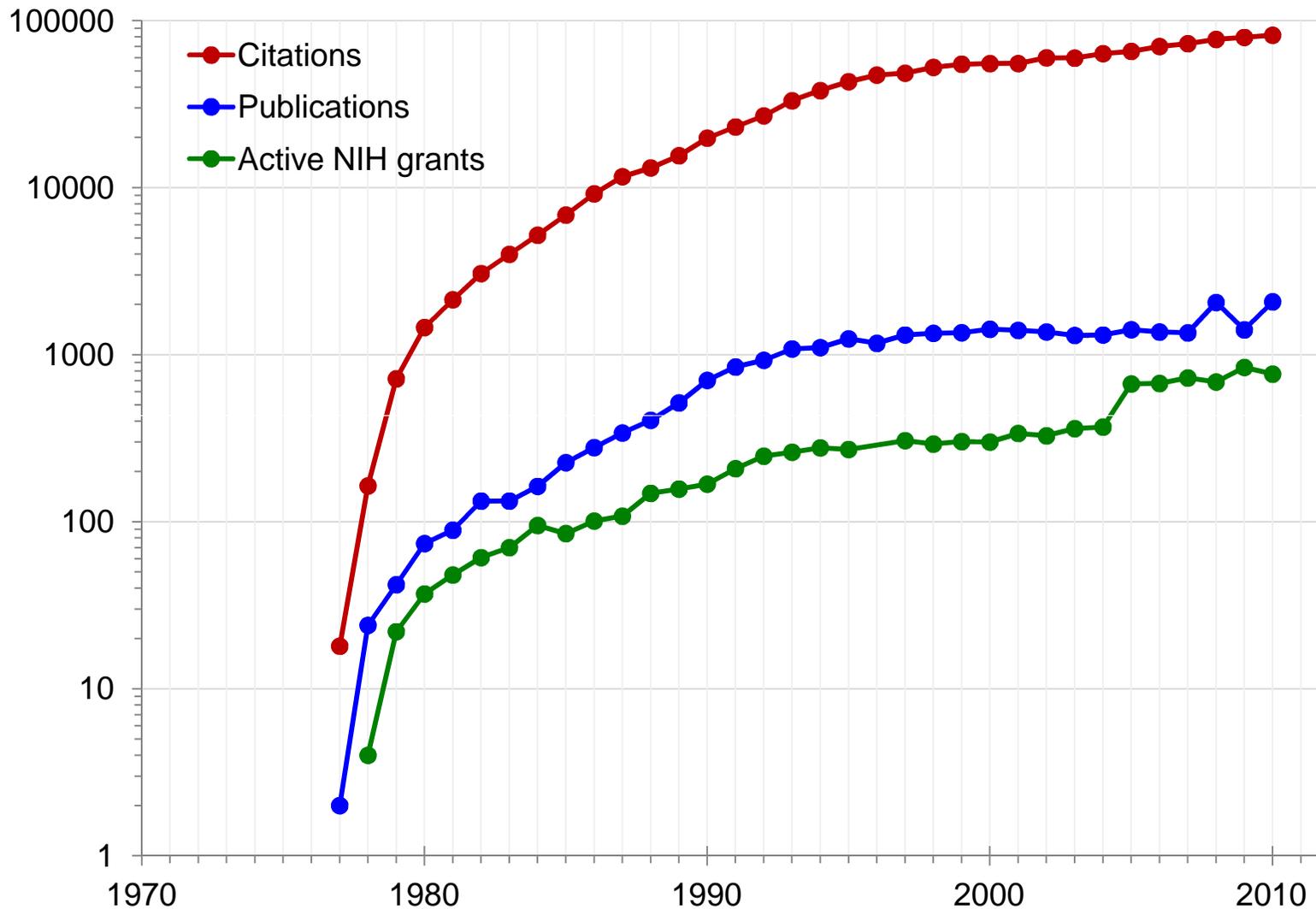
Number of Papers Indexed in Pubmed



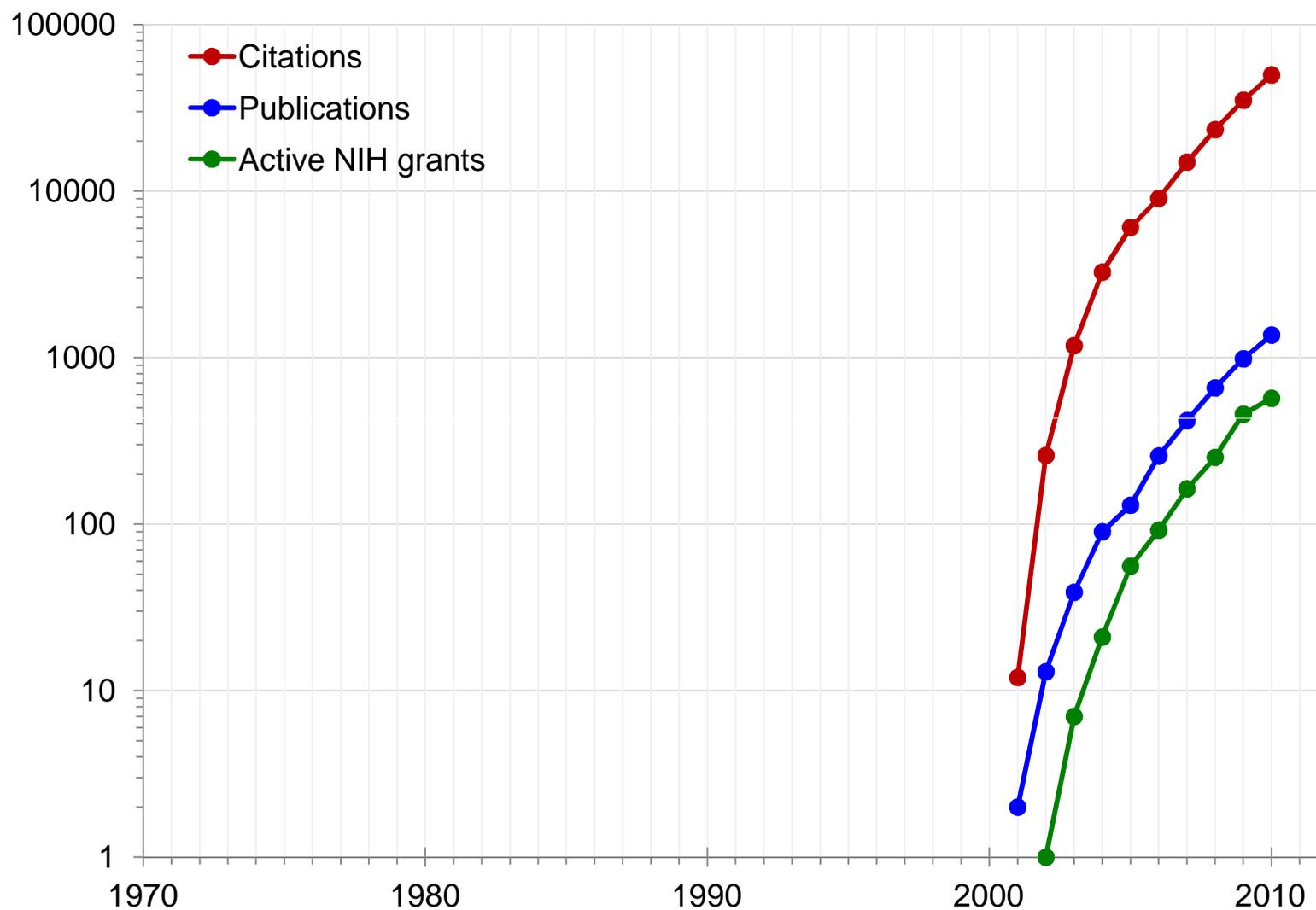
Trends in Selected Transformative Research Areas



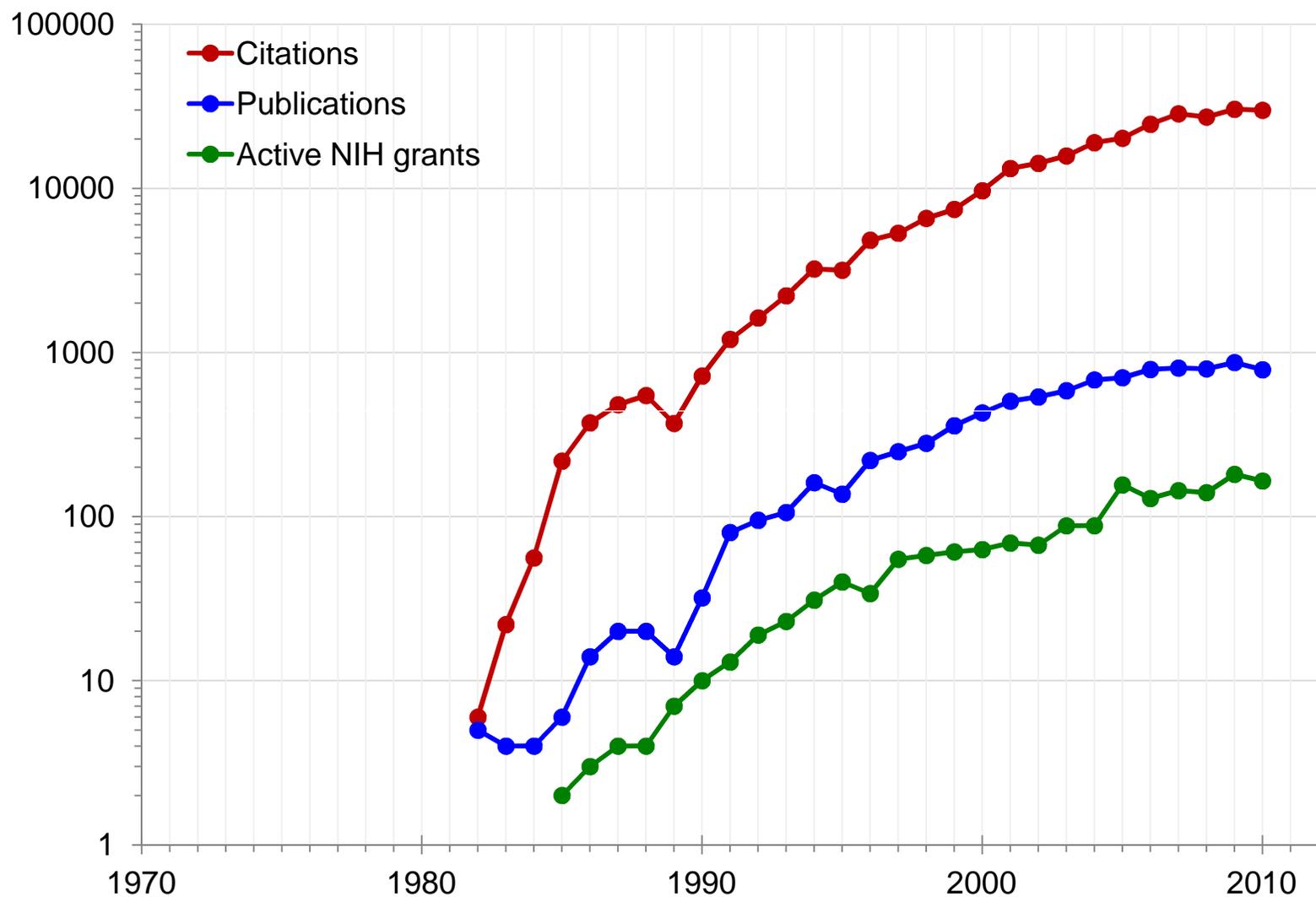
Trends in a Transformative Research Area: Splicing



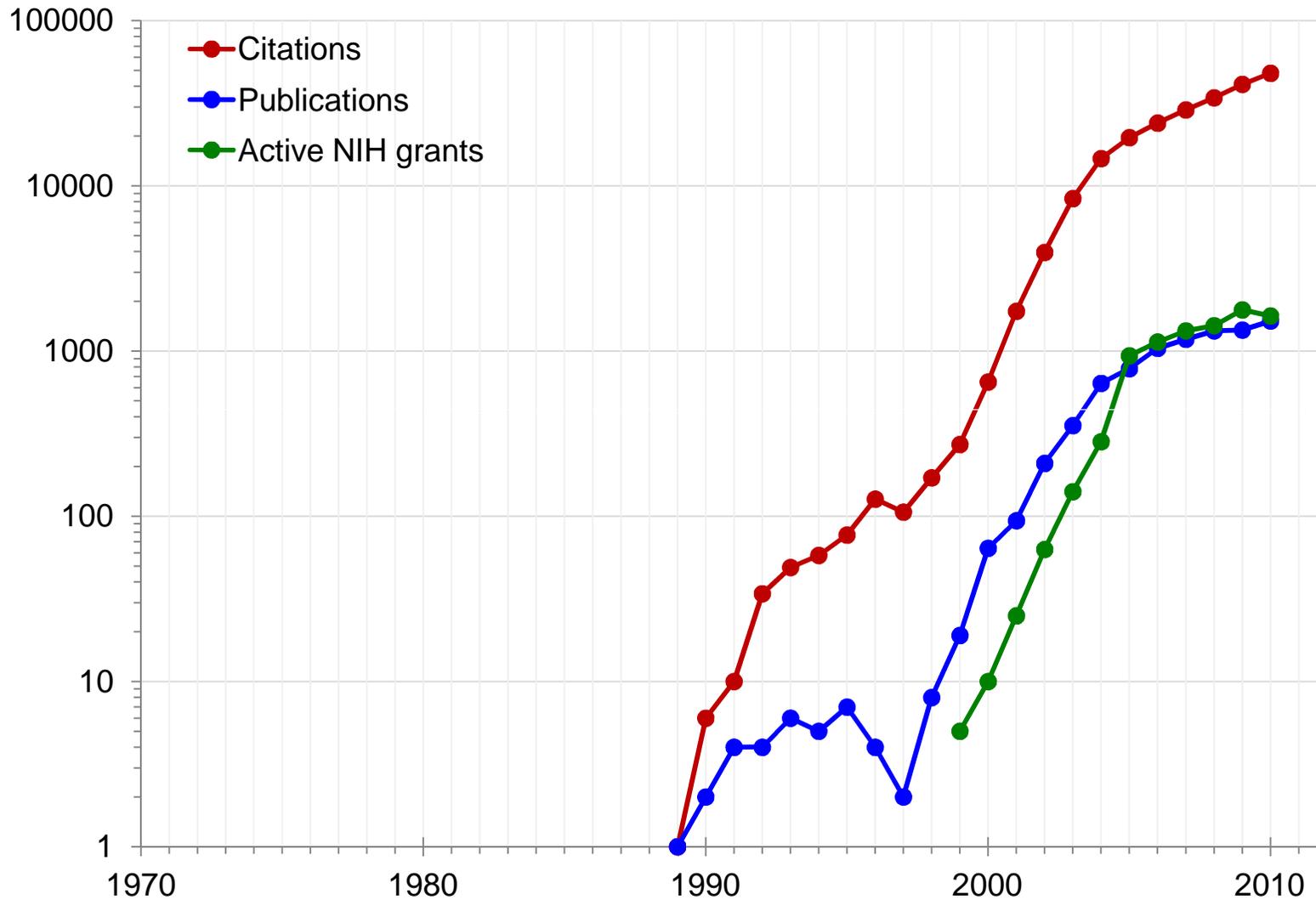
Trends in a Transformative Research Area: miRNA



Trends in a Transformative Research Area: Prions



Trends in a Transformative Research Area: RNAi



Can we identify emerging areas more quickly?

Time-honored methods:

- Read the literature
- Attend meetings
- Host workshops

Possible new methods:

- Automated monitoring of:
 - Citations
 - Mini-publications?
 - Search trends?





Search Trends

Tip: Use commas to compare multiple search terms.

Examples

[easter, spring break](#) [tapeworm](#) [freebsd, openbsd, netbsd](#)
[linkedin.com](#) [aol.com](#) [evite.com](#)

Hot Searches (USA)

- | | |
|--|----------------------------------|
| 1. welcome back kotter | 6. saul alinsky |
| 2. michael robinson | 7. pat sajak |
| 3. epstein | 8. gop debate |
| 4. republican debate | 9. jim irsay |
| 5. ferris bueller | 10. kim richards |

[More Hot Searches »](#)

Explore advanced features with [Google Insights for Search](#)

Explore flu trends across the U.S. with [Flu Trends](#)

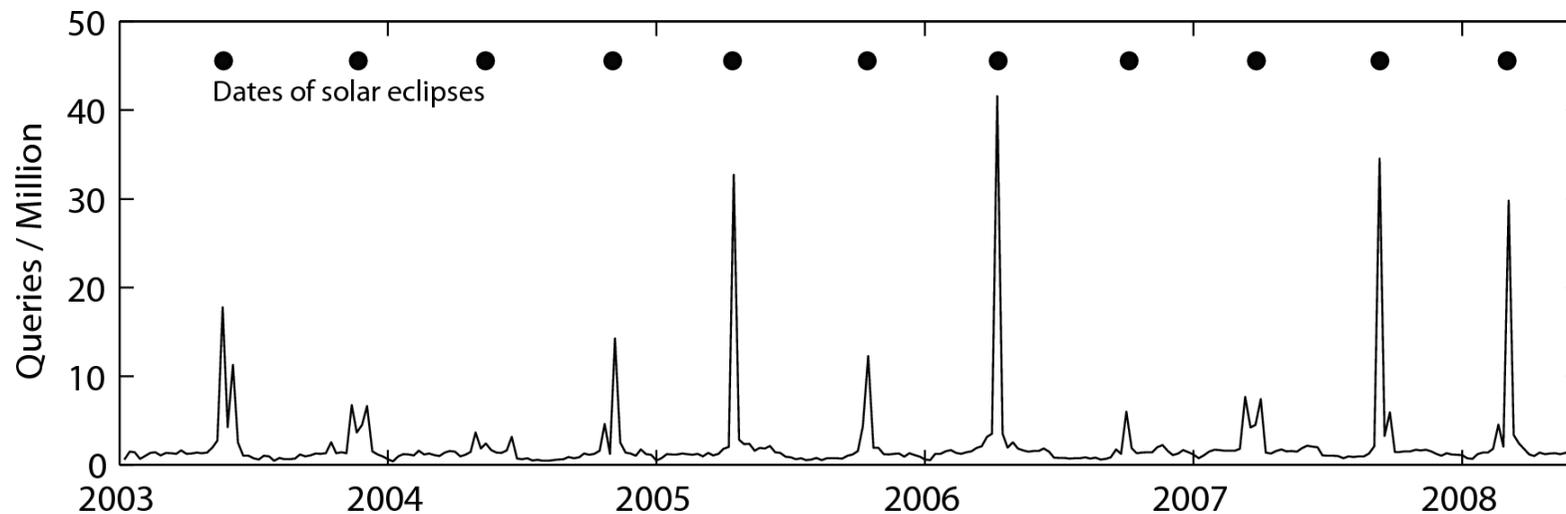
[Google Home](#) - [About Google Trends](#)

©2008 Google



Tracking Search Queries with Google Trends

Solar Eclipses

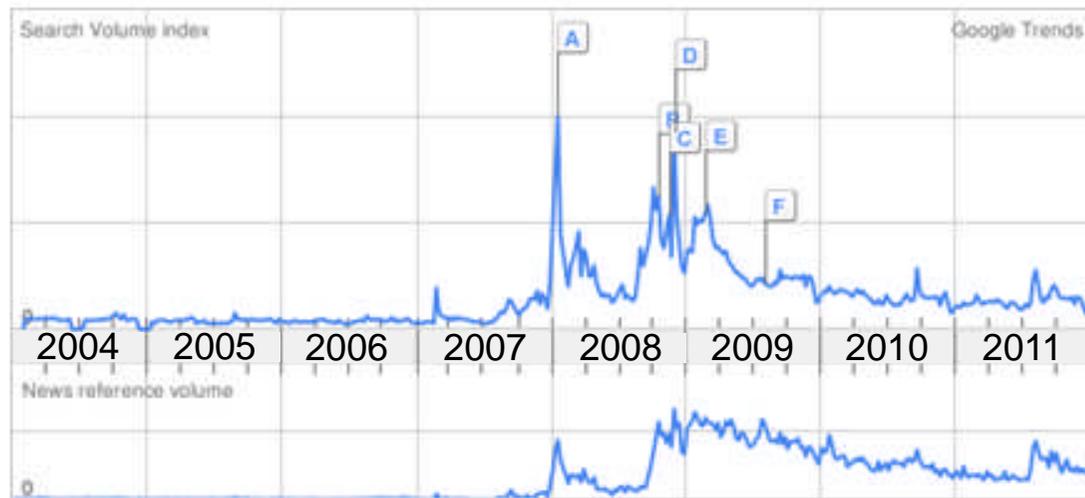


Weekly frequency of the search query “solar eclipse” in the United States from January 2003 to May 2008 and occurrences of solar eclipses, indicated by black dots

From Ginsberg et al. *Nature* **457**:1012-1014 (2009)



recession



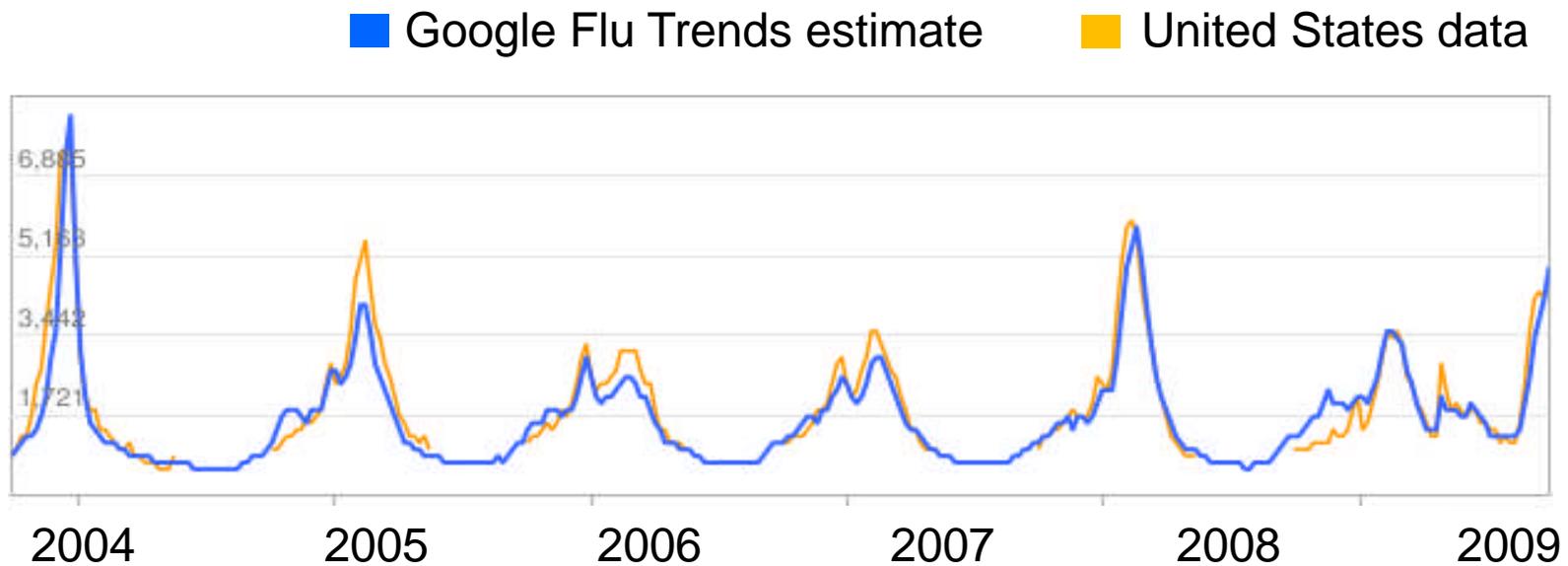
- A** [Oil lower on US recession fears](#)
RTE.ie - Jan 22 2008
 - B** [Loonie tumbles on global recession fears](#)
Calgary Herald - Oct 24 2008
 - C** [Japan in recession](#)
AsiaOne - Nov 17 2008
 - D** [US officially in recession](#)
Financial Post - Dec 2 2008
 - E** [Bernanke says recession to linger](#)
Reuters - Feb 25 2009
 - F** [Recession means fewer babies; US births fell 2 pct](#)
Seattle Post Intelligencer - Aug 7 2009
- [More news results »](#)

Rank by recession

Subregions		Cities		Languages	
1. District of Columbia , United States	_____	1. Washington, DC, USA	_____	1. English	_____
2. New Jersey , United States	_____	2. New York, NY, USA	_____		
3. New York , United States	_____	3. Richardson, TX, USA	_____		
4. Connecticut , United States	_____	4. Raleigh, NC, USA	_____		
5. Maryland , United States	_____	5. Philadelphia, PA, USA	_____		
6. Nevada , United States	_____	6. Miami, FL, USA	_____		
7. Georgia , United States	_____	7. Irvine, CA, USA	_____		
8. Pennsylvania , United States	_____	8. Atlanta, GA, USA	_____		
9. South Carolina , United States	_____	9. Pleasanton, CA, USA	_____		
10. North Carolina , United States	_____	10. Boston, MA, USA	_____		

Tracking Search Queries with Google Trends

United States Flu Estimate



United States: Influenza-like illness (ILI) data provided by the U.S. Centers for Disease Control

From the Google Flu Trends web site: www.google.org/flutrends/



PubMed trends

Search Trends

Tip: Use commas to compare multiple search terms.

Hot Searches (USA)

- | | | | |
|----|---|-----|---|
| 1. | ? | 6. | ? |
| 2. | ? | 7. | ? |
| 3. | ? | 8. | ? |
| 4. | ? | 9. | ? |
| 5. | ? | 10. | ? |



Identifying Correlated Search Terms

The screenshot shows the Google Correlate search interface. At the top left is the 'Google correlate' logo. A search bar contains the text 'ribosome' with a close button (X) to its right. To the right of the search bar is a button labeled 'Search correlations'. Below the search bar is a checkbox labeled 'Exclude terms containing ribosome' which is currently unchecked.

On the left side of the interface, there are several navigation links: 'Compare US states', 'Compare weekly time series' (which is highlighted), 'Compare monthly time series', 'Shift series' (with a text input field containing '0' and the label 'weeks'), 'Country:' (with a dropdown menu showing 'United States'), 'Documentation', 'Comic Book', 'FAQ', 'Tutorial', and 'Whitepaper'.

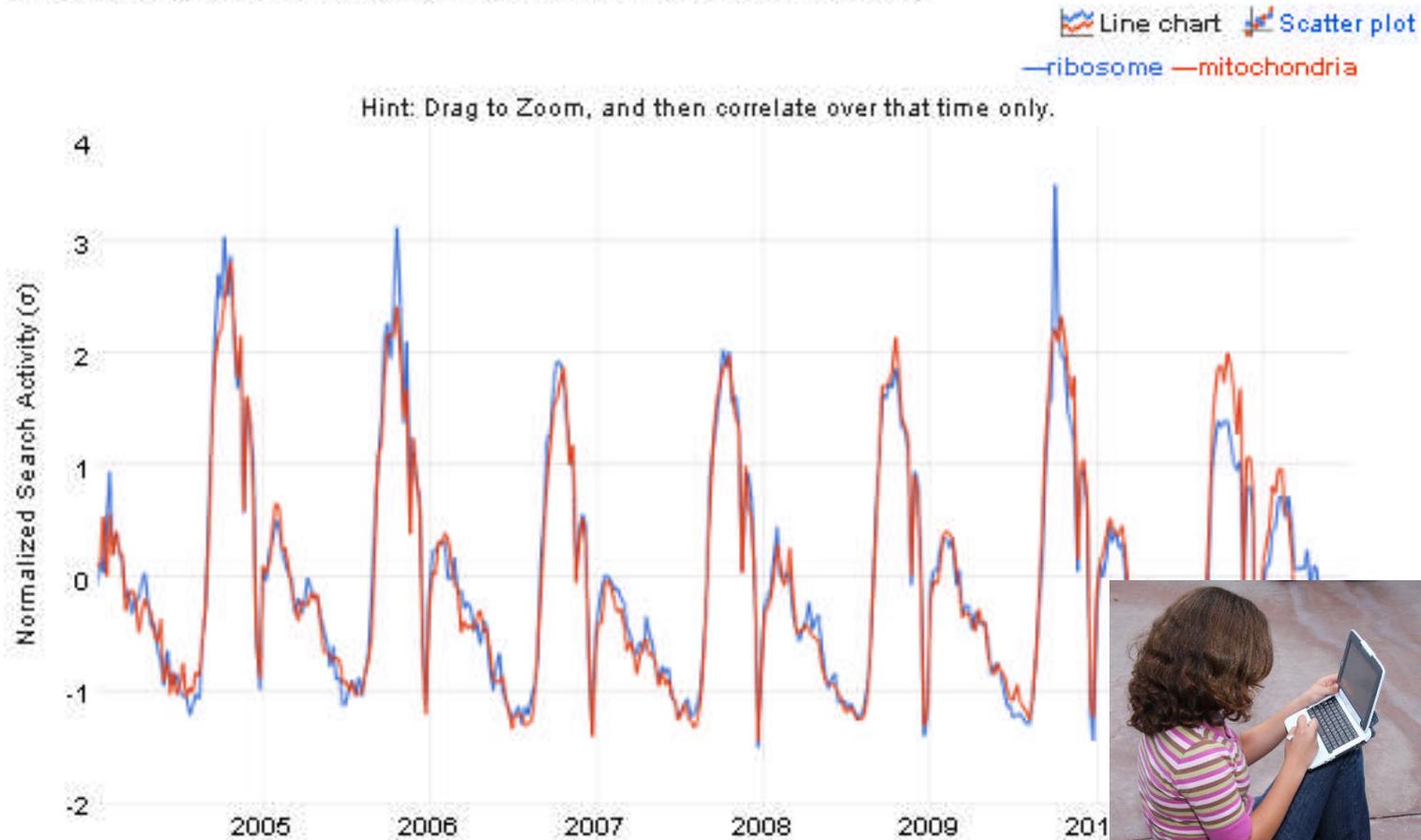
On the right side, under the heading 'Correlated with ribosome', there is a list of terms with their correlation scores. The top item is '0.9800 mitochondria', which is highlighted with a blue background. Other items include '0.9763 cell wall', '0.9720 plant cells', '0.9718 chloroplasts', '0.9709 plant cell', '0.9691 animal cells', '0.9687 reticulum', '0.9671 endoplasmic', '0.9664 chromatin', and '0.9661 federalists'.

At the bottom of the right side, there is a 'Show more' button, a link 'Sign in to export data as CSV', and a 'Share:' section with icons for Google+, RSS, Twitter (with the text 'Tweet'), Facebook, and a '+1' button.



The Ribosome / Mitochondria Connection

United States Web Search activity for ribosome and mitochondria ($r=0.9800$)



Acknowledgments

- Geetha Senthil
- Paula Fearon
- Workshop Planning Committee
- Carole Christian



QUESTIONS?

