

NIH Update

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Council of Councils

January 31, 2014

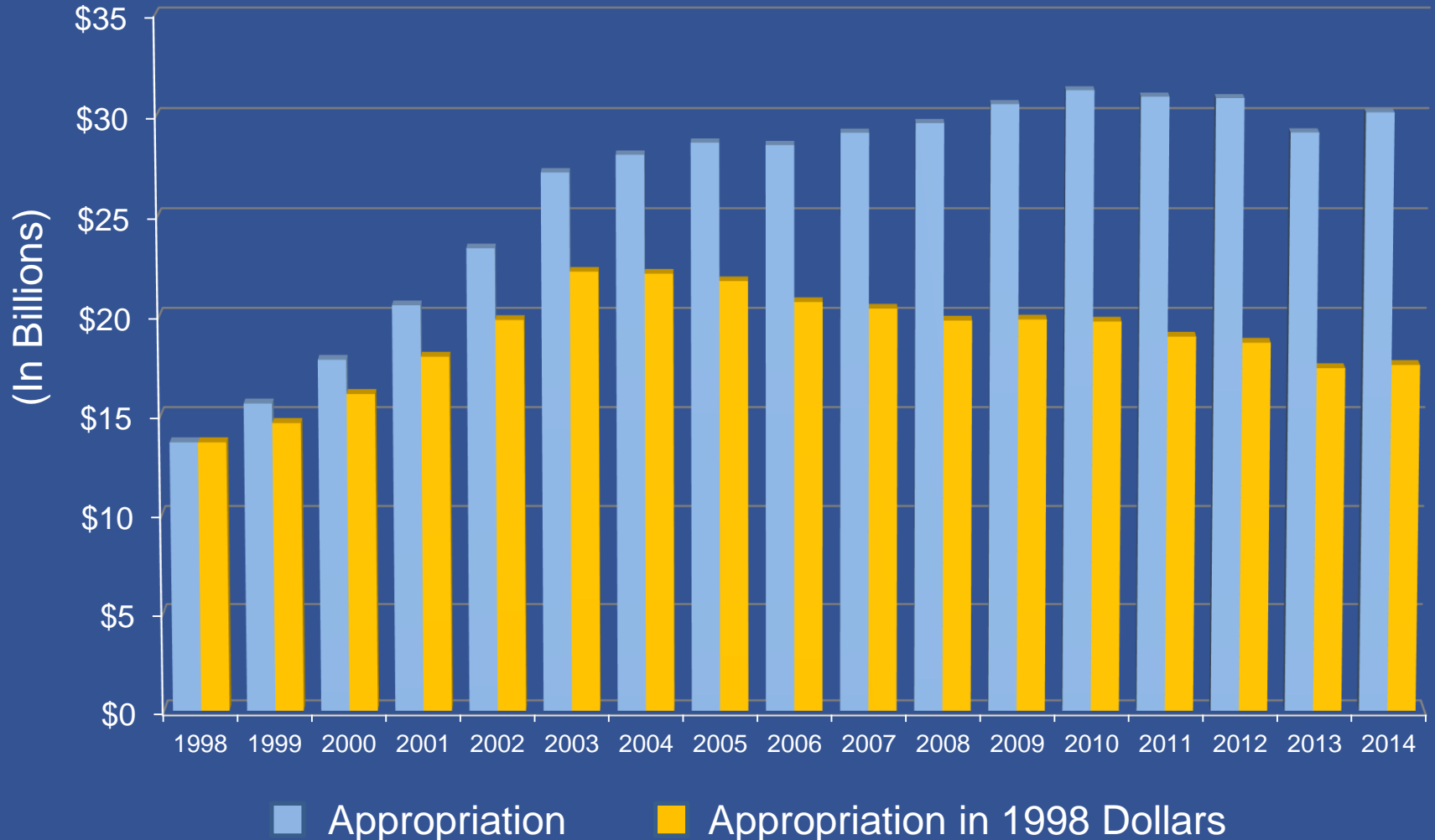


Topics

- Budget Update
- Challenges
 - Identifying Emergent Fields of Science
 - Approaches to Supporting Science
 - Enhancing the NIH Biosketch
- Reproducibility
- Breakthroughs in Science



NIH Program Level in Nominal Dollars and Constant 1998 Dollars, FY1998 – FY2014



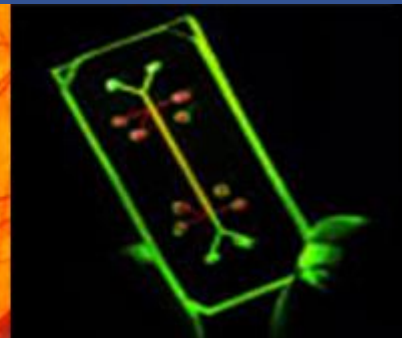
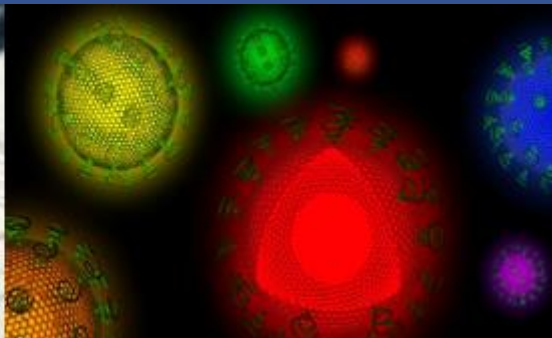
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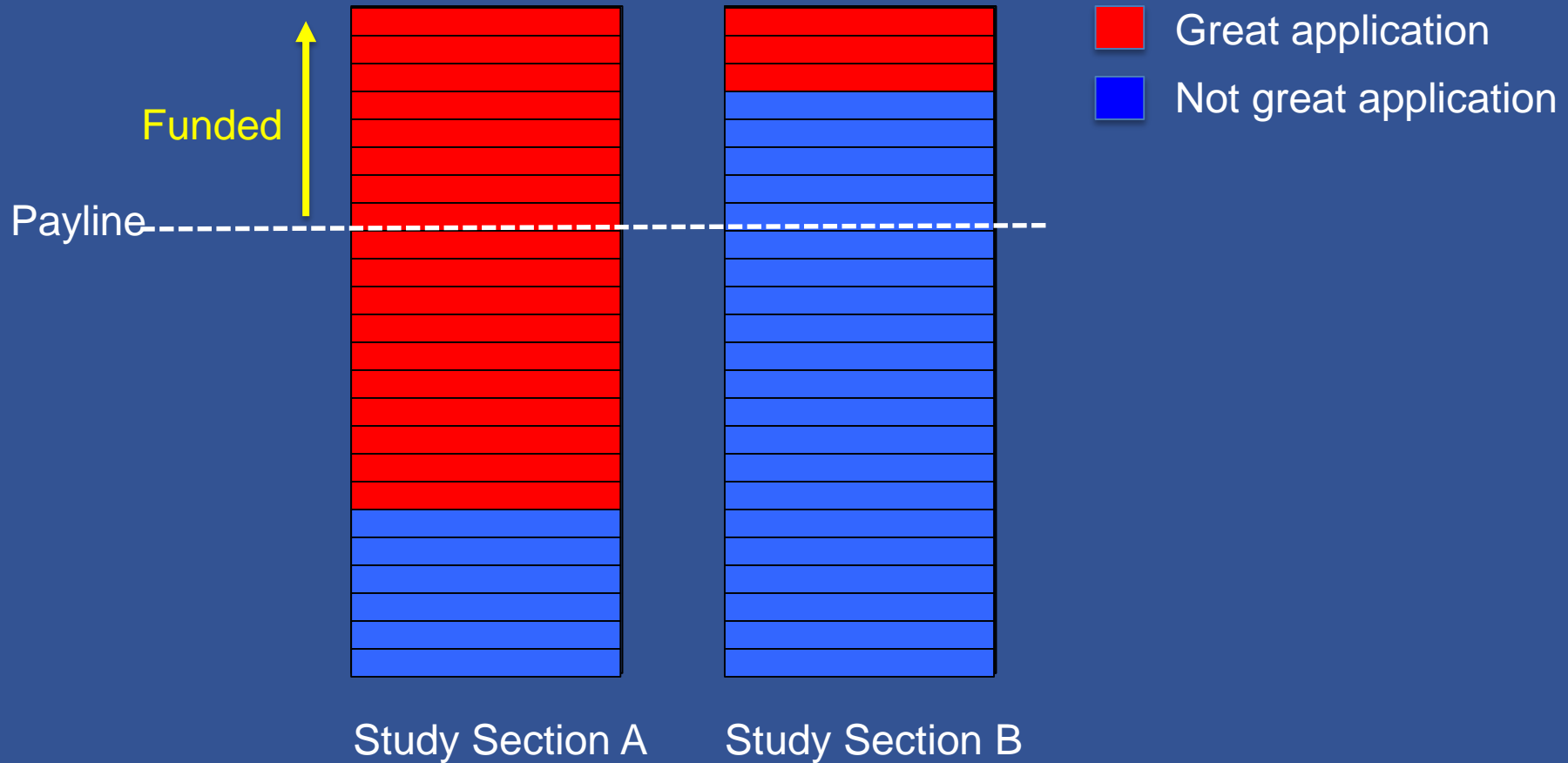


Challenge: Getting the Best Science from Peer Review

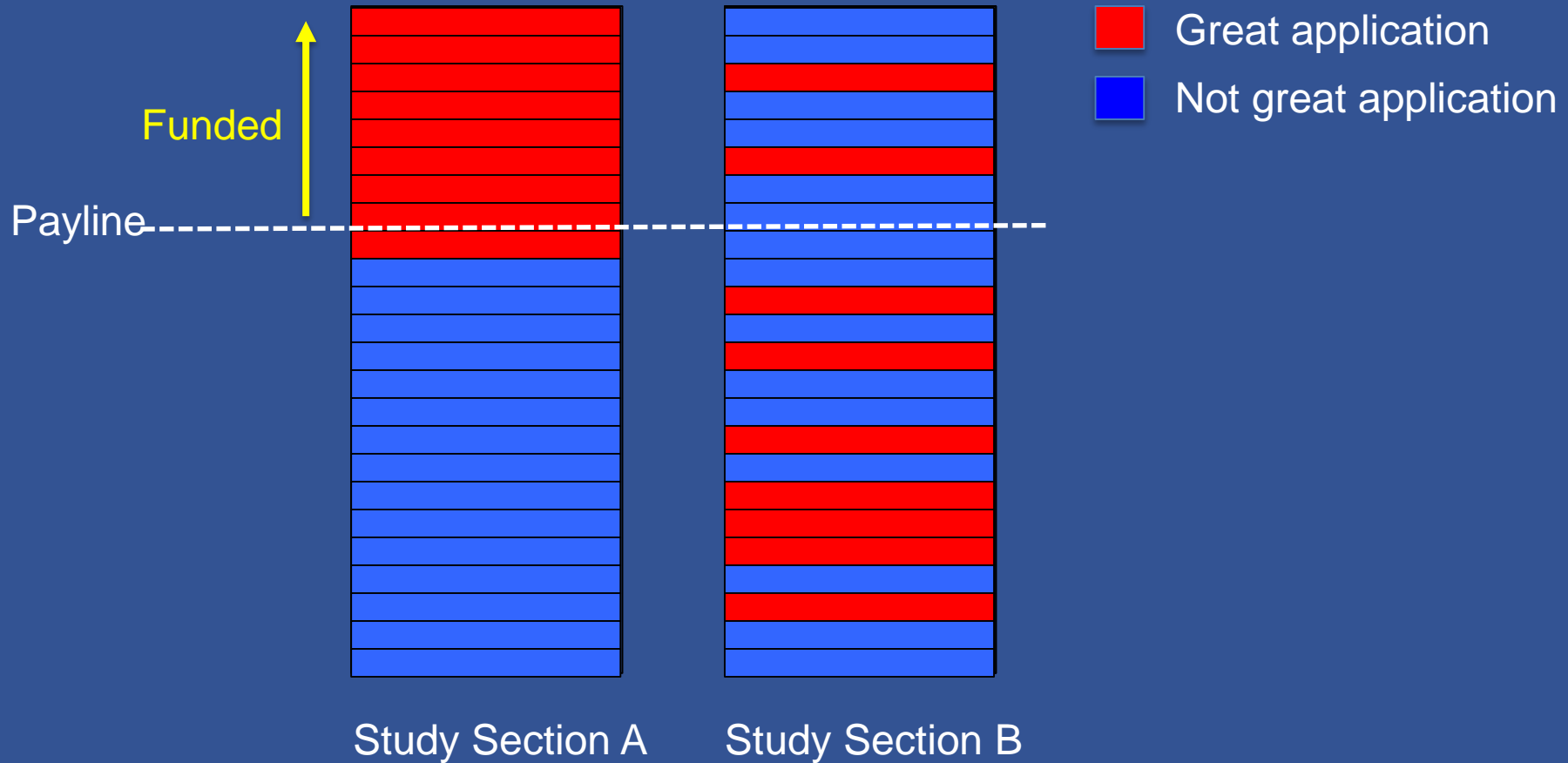
- Biomedical science is evolving rapidly, *but* the overall structure of NIH peer review study sections remains static – raising concerns
- How can NIH more proactively identify emergent, or especially productive, fields of science?
- How can NIH avoid “entitlements” in areas of science with less productivity?



What's the problem?



What's the problem?



Getting the Best Science from Peer Review: Hurdles

- Few interim (or surrogate) markers of research value
- Citations of “high impact” journals over-emphasized
- Difficult to evaluate characteristics of study section “behavior” or “performance”
 - How might we ensure the best use of our resources?



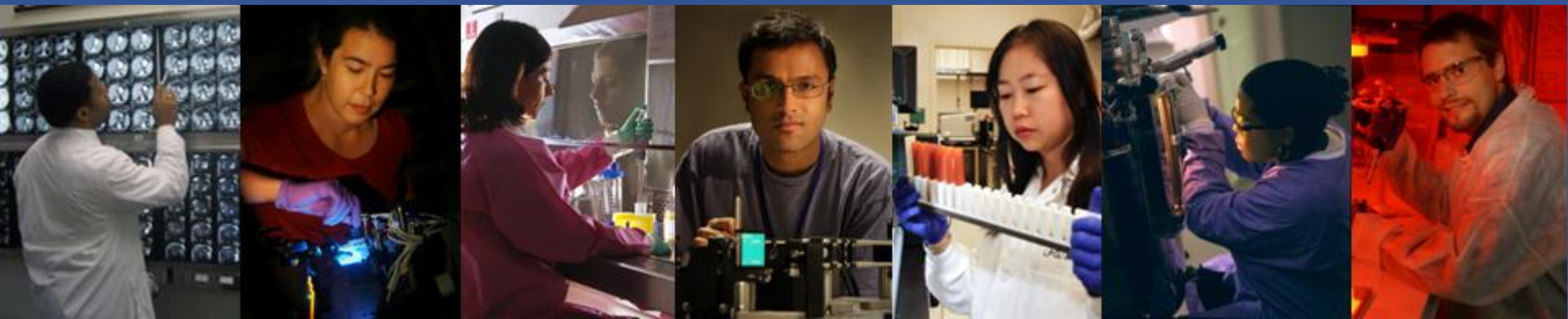
What Can We Examine?

- Analysis of Study Section/IRGs for relatedness, performance behavior
- Analysis of study section “inputs” and “outputs”
- Analysis of Review Group Outputs (ARGO)
 - Bibliometric history of publications (or patents) attributed to funded applications
 - Retrospective “case studies” of important scientific discoveries



Another Challenge: Identifying Emergent Opportunities

- Scientific community remains our best tool
- Should we supplement this approach with analytics to detect rapidly emerging ideas – and enable earlier investment?



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Challenge: Approaches to Supporting Science

- At a time of budgetary constraints, how best might we enhance support for extramural research – how do we:
 - Build on successful Pioneer Awards experience?
 - Define important attributes of such approaches?
 - Address concerns specific to certain groups of PIs?
 - Identify needed changes to existing programs?
- Could such approaches help ameliorate the “perverse incentives” that contribute to a hypercompetitive atmosphere?

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Challenge: Enhancing the Biosketch

Past performance is an essential element in review

- **Goal:** collect information that emphasizes actual contributions over academic and research pedigree
- **Enhancement option:** replace “15 peer-reviewed publications” with narratives describing up to 5 most significant contributions
 - How do we ensure narrative approach shifts focus from perceived pedigree to past performance?



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NIH plans to enhance reproducibility

Francis S. Collins and **Lawrence A. Tabak** discuss initiatives that the US National Institutes of Health is exploring to restore the self-correcting nature of preclinical research.

A growing chorus of concern, from scientists and laypeople, contends that the complex system for ensuring the reproducibility of biomedical research is failing and is in need of restructuring^{1,2}. As leaders of the US National Institutes of Health (NIH), we share this concern and here explore some of the significant interventions that we are planning.

Science has long been regarded as 'self-correcting', given that it is founded on the replication of prior work. Over the long term, that principle remains true. In the

shorter term, however, imbalances that once have been hobbled by the ability of today's researchers to replicate others' findings.

Let's be clear: we have no evidence that reproducibility is about to collapse. In 2011, the Office of the US Department of Health and Human Services pursued a plan to address the problem. Even if this represents the actual problem

"Efforts by the NIH alone will not be sufficient to effect real change in this unhealthy environment."

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Science Breakthrough of the Year (2013)



*Targeting the
immune system, not
the tumor itself*

What stops the body from waging its own “war on cancer”?

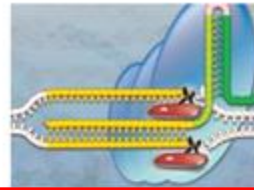
- NIH-funded researchers are finding answers – and interventions to help our immune cells fight tumors
 - Blocking protein receptors that hinder immune response*
 - CTLA-4
 - Anti-PD [programmed death] 1
 - Genetically engineering immune cells to target tumor cells

Science Breakthroughs Funded by NIH



Runners Up

Genetic
Microsurgery for
the Masses



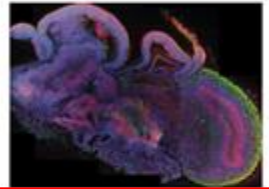
CLARITY Makes It
Perfectly Clear



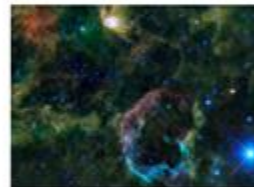
Human Cloning at
Last



Dishing Up Mini-
Organs



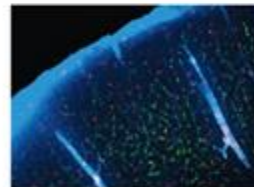
Cosmic Particle
Accelerators
Identified



Newcomer Juices
Up the Race to
Harness Sunlight



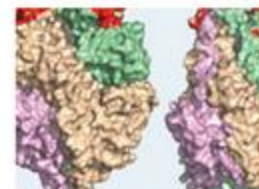
To Sleep,
Perchance to
Clean



Your Microbes,
Your Health



In Vaccine
Design, Looks Do
Matter





NIH...

Turning Discovery Into Health

