



Bruce Alberts is Editor-in-Chief of *Science*.

## Overbuilding Research Capacity

POLICIES THAT OFFER INCENTIVES FOR INDIVIDUALS AND INSTITUTIONS CAN UNINTENTIONALLY induce harmful behaviors. One such perverse incentive encourages U.S. universities, medical centers, and other research institutions to expand their research capacities indefinitely through funds derived from National Institutes of Health (NIH) research grants. A reliance on the NIH to pay not only the salaries of scientists but also the overhead (or indirect) costs of building construction and maintenance has become a way of life at many U.S. research institutions, with potential painful consequences. The current trajectory is unsustainable, threatening to produce a glut of laboratory facilities reminiscent of the real estate bust of 2008 and, worse, a host of exhausted scientists with no means of support.

The NIH actually rewards institutions for paying faculty salaries with unguaranteed “soft money” from research grants by providing increased overhead payments. Amazingly, any institution that draws on its own finances to pay its professors is doubly disadvantaged: It must not only use its own funds but also loses the overhead on the salaries that it would otherwise accrue. In addition, the NIH will reimburse institutions for the cost of new research buildings, paid out as overhead charges on research grants as the building depreciates over several decades. The possibility that the NIH will ultimately pay for both new building costs and new staff enables the many advocates for expansion to effectively argue that the costs will eventually be borne in large part by the U.S. government.

This type of argument has strongly encouraged a large number of institutions to expand “on spec,” taking out loans and gambling that they will win enough NIH research grants to pay for the expansion. There is a huge risk here. Because the NIH budget cannot increase at a high enough rate to pay for the ever-expanding U.S. biomedical research enterprise, each institution is betting that the faculty in its new facilities will outcompete those at other institutions for the limited research grants available. Institutions are thus pitted against each other in a process that resembles an arms race.

The results are not pretty. With success rates for acquiring an NIH grant below 10% in some cases, achieving a stable research career now has elements of a lottery, with one’s future depending on a chance ranking assigned through a peer-review process that is unable to discriminate adequately among a sea of research proposals. Biomedical scientists are spending far too much effort writing grant applications and reviewing those of others, leaving precious little time to do what they should be doing: reading the scientific literature and thinking deeply about their research and teaching. And I worry about the future of universities, given the incentives to overinvest in research at the expense of needed facilities and faculty for teaching.

What can be done? NIH Director Francis Collins has boldly stated that “it is time for NIH to develop better models to guide decisions about the optimum size and nature of the U.S. workforce for biomedical research.”\* I agree. One possibility is for the NIH to require that at least half of the salary of each principal investigator be paid by his or her institution, phasing in this requirement gradually over the next decade. Alternatively, the maximum amount of money that the NIH contributes to the salary of research faculty (its salary cap) could be sharply reduced over time, and/or an overhead cost penalty could be introduced in proportion to an institution’s fraction of soft-money positions (replacing the overhead cost bonus that currently exists).

Regardless of mechanism, here is my bottom line: A new NIH policy must make it unambiguously clear that expansion through laboratory building construction requires a substantial, nonreimbursable, long-term commitment of resources, including “hard-money” faculty support, by any institution that wants to increase its facilities and research staff. Although change will be painful, it is urgently needed to maintain a healthy biomedical research enterprise.

– Bruce Alberts

10.1126/science.1197077

\*F. S. Collins, *Science* 327, 36 (2010).



Downloaded from <http://www.sciencemag.org/> on May 9, 2021

## Overbuilding Research Capacity

Bruce Alberts

*Science* **329** (5997), 1257.  
DOI: 10.1126/science.1197077

ARTICLE TOOLS	<a href="http://science.sciencemag.org/content/329/5997/1257">http://science.sciencemag.org/content/329/5997/1257</a>
RELATED CONTENT	<a href="http://science.sciencemag.org/content/sci/330/6007/1045.3.full">http://science.sciencemag.org/content/sci/330/6007/1045.3.full</a> <a href="http://science.sciencemag.org/content/sci/330/6007/1047.1.full">http://science.sciencemag.org/content/sci/330/6007/1047.1.full</a> <a href="http://science.sciencemag.org/content/sci/330/6007/1045.2.full">http://science.sciencemag.org/content/sci/330/6007/1045.2.full</a> <a href="http://science.sciencemag.org/content/sci/330/6007/1045.1.full">http://science.sciencemag.org/content/sci/330/6007/1045.1.full</a>
PERMISSIONS	<a href="http://www.sciencemag.org/help/reprints-and-permissions">http://www.sciencemag.org/help/reprints-and-permissions</a>

Use of this article is subject to the [Terms of Service](#)

---

*Science* (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science* is a registered trademark of AAAS.

Copyright © 2010, American Association for the Advancement of Science