

Iceberg Alert for NIH

A CENTURY AGO, THE UNSINKABLE *TITANIC* CHARGED INTO A MOONLESS NIGHT, FULL STEAM AHEAD. Today, unless it changes course to escape its own icebergs, the U.S. biomedical research enterprise hurtles toward a similar doom. The fiscal year 2012 budget of the U.S. National Institutes of Health (NIH) buys 18% less research than in 2004. On 2 January 2013, budget sequestration mandated by the Budget Control Act of 2011 could reduce NIH extramural funds still further, producing a staggering cumulative 41% decline in a single decade (in constant dollars, from 2004 to 2014), down to the level that NIH invested in 1997. In contrast, China's governmental support for biomedical research may double that of the United States, or even, in proportion to gross domestic product (GDP), quadruple it by 2017.*

In dollars, the contributions of NIH-supported research to human health, jobs, and national economic growth far surpass investments budgeted by Congress. The obvious inference: Investment in NIH should not shrink but steadily increase, at a rate proportional to GDP. Instead, as grant dollars shrink, institutions will be forced to curtail biomedical research drastically, mimicking the recent layoff of researchers and hundreds of other employees by the University of Miami's Miller School of Medicine. Established researchers at rich institutions may survive, but many in the rising generation of young investigators and in small research programs will drown. Institutions will further trim hard-money contributions to faculty salaries and find it even harder to pay for and populate research facilities they recently expanded. Competition for faculty positions, grants, and published papers will grow ever fiercer. And the postdoctoral holding tank will brim over, as myriad well-trained young scientists vainly seek research jobs.

Apparently unaware that the model for funding U.S. biomedical research is close to collapse, key stakeholders in the biomedical research community, like mythical *Titanic* passengers, busy themselves rearranging deck chairs. We urge those stakeholders—faculty, academic administrators, funding agency leaders, and (if it can) Congress itself—to unite to plot a dramatically different course. Radical actions are called for that distribute scarce resources more efficiently, with a focus on helping the best young and established scientists survive the present storm for as long as it lasts, even if it means a substantial decrease in the size of their research groups.

Research institutions must discard their present corporate business model, which is based on the assumption that federal funds to support research programs will increase every year. Those institutions must invest more in direct salary support for faculty scientists and less in bricks and mortar. NIH should require institutions to pay a larger share of principal investigators' salaries (in increments, spread over time), and indirect cost rules that currently encourage universities to build labs rather than nourish their own faculty must be changed.† Even more broadly, faculty, administrators, research institutions, and NIH must work together to tackle knotty problems of resource distribution, as we describe in the supplement.

Academic labs today depend on graduate students and postdocs to supply the workforce that keeps them humming. This dependence, which generates multiple potential competitors for soft-money positions and grants but does not always train young scientists effectively, must be reduced by implementing and further strengthening the recommendations of a just-released report from NIH's Biomedical Research Workforce Working Group.‡

To devise effective local and national responses to the impending crisis, new strategies must be implemented quickly. The status quo is untenable, and the alternatives are dire: Failure to adjust to the new reality means that stakeholders may be forced to scrounge seats in a lifeboat, or—like the majority of *Titanic* passengers—drown. — Henry R. Bourne and Mark O. Lively

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*See supplementary materials at www.sciencemag.org/cgi/content/full/science.1226460/DC1 (text and figure).

†B. Alberts, *Science* **329**, 1257 (2010). ‡http://acd.od.nih.gov/bmw_report.pdf.



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