

## ONLINE FIRST

# Facing the NIH Funding Crisis

## How Professional Societies Can Help

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**S**UCCESS RATES AT OBTAINING NATIONAL INSTITUTES OF Health (NIH) funding are at historic lows. Last January, the NIH posted an 18% success rate in 2011 for funding of R01 grants deemed scientifically meritorious by peer review.<sup>1</sup> R01 grants are the major funding mechanism for individual laboratories and the major funding mechanism for investigator-initiated projects.<sup>1</sup> The 18% success rate contrasts with rates of 22% in 2010, 25% to 32% in 1993-2003, and 45% to 58% in 1962-1966. The decrease in funding is a combination of many factors. There was an increase in the number of applications (a record 49 592 in 2011) and an increase in ongoing commitments to already funded research projects. For example, 75% of the \$15.8 billion that the NIH spent on extramural grants went to existing projects in 2010.<sup>1</sup> One contributing factor to the increase in applications is that mandated reductions in grant budgets require a given laboratory to have more grants to support the same research effort. Another factor is increasing biomedical inflation, which, given flat budgets, also means that more grants are required to support the equivalent effort.<sup>2</sup> Nonetheless, biomedical science in the United States faces an unprecedented, dismal situation, with application success rates for NIH extramural research projects at an all-time low.

This pessimistic funding outlook contrasts sharply with current excitement in the achievements of medical science. The ability to decipher genetic information and identify abnormalities in DNA, RNA, and proteins that contribute to disease has provided immense new opportunities to understand human physiology and disease pathogenesis, derive new therapies, and improve health. Immunological insights have similarly led to novel, effective therapies for lymphoma and other cancers. In addition, development and exploitation of model systems (eg, induced pluripotent stem cells) hold significant promise as discovery tools. The future is bright, but the route to that future is complicated by a lack of federal investment in research.

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See also p 2341.

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Of more concern, the current dismal funding rate may be the ceiling and not the floor, if the sequester mandated by the Budget Control Act occurs as scheduled on January 2, 2013. This sequester would eliminate at least 7.8% from the NIH budget, which would result in a decrease of a minimum of 1849 research awards from the NIH.<sup>3</sup> What is lost in this disturbing scenario is the economic effects the sequester would have. The NIH directly or indirectly supports 432 092 jobs, but the sequester would reduce this number by 33 704,<sup>3</sup> a job loss that should raise concerns for legislators. Such workforce reductions may not be completely reversible, because advancing technology means that some of these employees may lose the skills necessary to conduct research. Other investigators may leave research altogether for other types of employment, leaving a permanent gap in the medical science workforce. Because medical technology is one area in which the United States still holds relative international market dominance, the sequester could adversely affect one of the nation's remaining economic strengths.<sup>4</sup> Public investment is crucial in the origin of the export strength of the biomedical industry.<sup>4,5</sup> Given the recent emphasis on generating domestic jobs and increasing exports, it is surprising that funding medical research, which enhances economic growth, did not receive more attention.

Facing this funding crisis has led some physicians and medical scientists to become increasingly vocal, others to rationalize, and a few to ignore the situation. Discussion has dominated the public medical research landscape, but there are few concrete actions. Although the seemingly overwhelming nature of this research funding crisis could lead to paralysis, there are still effective pathways to assist medical research through this potential chasm in funding, but these approaches need to be embraced by the entire medical research community to have any real effect. The American Society of Hematology (ASH) announced one such pathway a short while ago: a \$9 million program funding 90 bridge grants over the next 3 years.<sup>6</sup>

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ASH designed the program to keep productive hematology investigators from losing their laboratories. The goal is to maintain a hematology research workforce that can build on the research successes that resulted in the remarkable improvement in the care of patients with serious blood disorders. These grants will support basic, clinical, and translational hematology investigators who have applied for NIH R01 or equivalent funding but have been denied. The application will be brief, consisting of 2 pages addressing the NIH peer review critique and defining new specific aims for a future revised proposal and a 1-page letter of institutional support. ASH will require that the investigator's institution provide a 50% match of funding and commit that the investigator's position and laboratory space will be maintained for the duration of the bridge funding. The quality of the scientist and the proposed science will be equally weighed in ASH's funding decisions.

ASH is actively seeking to leverage its financial commitment by generating cosponsors of this initiative from corporations and foundations. Such cosponsorships could markedly increase the power of this approach by funding many more bridge grants. The biotechnology and pharmaceutical industries should have an interest in partnership, because they too depend on a well-trained workforce of innovative scientists and also collaborate extensively with academic investigators in the development of drugs, devices and tests. Recent studies have documented the importance of academia in drug development, even as the success of the expensive research and development arms of these companies has decreased.<sup>5</sup> Their own survival is also at stake.

An even more potent way to leverage this approach would be if all medical societies agreed to support their own disciplines. If each society took ownership of its respective discipline's investigator workforce instead of simply lamenting the demise of medical research funding, perhaps the country might not lose a generation of medical investiga-

tors.<sup>3,5</sup> Certainly medical societies have been and must continue to be increasingly aggressive in multiple federal and public venues in their support of NIH funding. However, decisions by a society to spend its own money are more difficult, yet it is not clear what a society's endowment is for, if not for a crisis such as this. If each medical society created a bridge program, the total financial support could be significant and could have a major influence on medical research. Nevertheless, bridge support from medical societies is not sustainable beyond the short term. Appropriate increases in state and federal funding remain essential to maintain the excellence of medical research in this country and to enhance such research as an economic engine.<sup>4,5</sup>

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