American Society for Biochemistry and Molecular Biology

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ASBMB IS CONCERNED ABOUT THE DECLINE IN SUPPORT FOR INVESTIGATOR-INITIATED RESEARCH: ACTION BY THE INSTITUTES OF NIH IS REQUIRED

Background

Scientific research has been a leading force in driving global prosperity over the past century, through both its economic and scientific benefits. Investment in research generates jobs and several-fold financial returns[1], while advances in health research have neutralized some of history's greatest killers, such as smallpox and measles, and reduced the burden and symptoms of a litany of chronic afflictions. Yet faced with an expanding, rapidly aging population, the health community will soon encounter challenges that require more effort and energy than ever before, necessitating an increased and sustained financial investment into both bench and clinical research.

Health-related spending now represents more than half of the country's research and development budget[2]. Recent history has demonstrated the benefits of attacking health-related issues at their core via basic scientific research: Developments in treatments for cancer, diabetes and even HIV/AIDS have been initiated at the bench. The National Institutes of Health are the largest driver of biomedical research in the United States. Through its support of basic scientific research, the agency has helped decrease the disease burden while expanding scientific knowledge, positioning the United States as an unrivaled scientific leader.

At the root of this success are the individual researchers whose groundbreaking work has produced advancements in understanding basic principles in molecular and cellular biology. The main means of NIH support for these investigators comes in the form of the investigator-initiated grant, the goal of which is to "support a discrete, specified, circumscribed project to be performed by the named investigator(s) in an area representing his/her specific interest and competencies."[3] Such flexibility allows researchers to pursue the various research avenues that lead to successful yet unexpected discoveries. In this light, the investigator-initiated grant is seen as the most vital force driving scientific research in this country.

[1] Families USA Foundation. 2008. *In Your Own Backyard: How NIH Funding Helps Your State's Economy*. Washington, D.C.
[2] National Science Board (NSB), *Science and Engineering Indicators 2010*. Arlington, VA: National Science Foundation (NSB 10-01)
[3] http://grants.nih.gov/grants/funding/r01.htm

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Current Problem

Between 1998 and 2003, a bipartisan effort in Congress grew the NIH budget from $13 to $26 billion, funding approximately 5,000 additional investigator-initiated grants and increasing the number of supported investigators by nearly 3,000. However, since 2004 the rate of growth in the budget has proceeded at a rate below that of inflation, resulting in fewer successful grants and a drop in the number of supported researchers. Between 2004 and 2009, the budget lost approximately 13% of its value, while funding for investigator-initiated grants remained flat. Moreover, the number of investigator-initiated grants supported by the NIH has markedly declined, leaving meritorious and important research projects unfunded. In 2009, the NIH awarded 1,506 fewer investigator-initiated grants than in 2003 (5,924, down from 7,430), resulting in 860 fewer investigators (6,045, down from 6,905) being supported.

We estimate that, to fund the same number of investigators as in 2003, the NIH would need to institute policies to make available between 1100 and 1500 additional investigator-initiated grants each year. This does not include Requests for Applications initiated through the NIH. The ideal solution to this problem would be a significant, sustainable yearly increase in the NIH budget from Congress. Unfortunately, given the current political and economic climate, this hope seems likely to go unrealized. Thus, on behalf of its 12,000 members, ASBMB urges the Institutes and Centers of NIH to take drastic action. We propose revising NIH policy so that the number of investigators who receive NIH funding immediately returns to the level reached after completion of the budget doubling in 2003.

The recommendations below ask for sacrifices from all involved parties; though it is clear that the current situation is unsatisfactory to all, it is necessary that everyone share the burden to promote the greater good for both science and society.

Recommendations

I. REBALANCE THE NIH BUDGET PORTFOLIO TOWARD INVESTIGATOR-INITIATED RESEARCH

The percentage of the NIH research budget spent on Research Project Grants (RPGs) has remained nearly constant since 2000, hovering around 74%. Amongst RPGs, however, the percentage spent on competing investigator-initiated grants has dropped by nearly 10%, to a current level that is 50% of total research spending. This decrease has been offset primarily by gains in funding for large science research centers such as the Genome-Wide Association Studies program and the Protein Science Initiative. Increases in spending in those areas have proved inefficient, suggesting a need for redistribution of funds to the more efficient investigator-initiated grants that support individual investigators. **We propose raising the percentage of total research funding going to investigator-initiated grants to 55% from 50%.** This

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action, rebalancing the funding portfolio to 2003 levels, would generate an estimated $850 million that could fund 2,200 additional grants, an enormous gain that would have widespread benefits. It is anticipated that this rebalancing would occur primarily by reducing or eliminating the least effective non-investigator initiated programs.

II. ADOPT A COMPETITIVELY BASED SLIDING SCALE

The current NIH peer-review system for awarding funding relies on matching the availability of funds with a list of proposals that have been ranked based on merit, necessarily leading to arbitrary cutoffs for paylines. Unfortunately, as overall funding for the NIH has stagnated, deserving, valuable projects have routinely been left unfunded as success rates for proposals have steadily dropped: Whereas, 1 out of 3 proposals used to be accepted, now the rate is less than 1 out of 5. It is imperative that meritorious projects receive some level of support. **We propose instituting a competitively based, sliding funding scale**. Various formulations could be used to institute this proposal: One example would be 100% funding for 0-5th percentiles, 90% funding for 5-10th percentiles, 80% for 10-15th percentiles, 70% for 15-20th percentiles (assuming that, with all measures taken, funding would occur up to the 20th percentile). Raw analysis finds that this sample sliding scale would result in approximately $600 million in annual savings (relative to FY09), allowing for approximately 1,300 new grants to be considered for funding. Though payline cutoffs would remain subjective, success rates would return to levels above 30%, allowing more investigator-initiated grants to receive at least partial funding.

III. RESTRICT THE AMOUNT OF FUNDING FOR ANY INDIVIDUAL INVESTIGATOR

Nearly 1600 investigators received more than $1 million in NIH funding during FY09, while 150 received more than $2 million. Given the merit-based system of scientific review used to allocate funding, these researchers are clearly deserving of their success. However, in these perilous fiscal times, it is necessary for all involved to sacrifice so as to provide a reliable funding stream for a broader segment of researchers. **We propose instituting a cap on the total amount of direct costs an investigator can receive from NIH.** While the efficiency of this policy would depend on the level of the cap, the potential exists to free up funding for as many as 5,000 additional investigator-initiated grants. If this concept is to be taken seriously, the research community must work to identify what is an acceptable cap, given current research initiatives, and develop a reasonable balance between impeding new research and making funding available for more grants. It is understood that there may need to be flexibility in the cap relative to the type of experimentation (i.e. yeast research would likely be less expensive than research that uses transgenic mice). One possible model comes from the National Institute of General Medicine Sciences (NIGMS), which institutes an automatic review of grant applications from any investigator already receiving more than $750,000. The efficacy of such a proposal has been illustrated by a recent study, conducted by NIGMS Director Dr. Jeremy Berg, that indicated researchers with funding at or below

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$500,000 in direct costs were as, and possibly more, productive than researchers receiving higher amounts.

Conclusion

These proposals are not meant as permanent measures; rather, they are emergency actions that we feel must be taken during this perilous financial period to maintain the long-term health of scientific research in this country. In addition, we would expect that different Institutes/Centers could use different aspects of these proposals appropriate to their specific missions. Ultimately, the goal for NIH should be to return the number of investigator-initiated grants to 2003 levels. Failure to retain our brightest minds in research today will lead to wide-ranging problems tomorrow and result in fewer innovations and decreased American competitiveness in the global arena. The recommendations made in this report represent logical, pragmatic solutions that will allow a larger number of investigators to continue what they have done for more than a century: drive America forward.

March 11, 2011

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