# Letters

## NIH Budget Crisis

Joseph Palca is to be commended for his clear and informative diagnosis of the deplorable funding situation at the National Institutes of Health (NIH) (News & Comment, 24 Nov., p. 988). His excellent article does not, however, spell out the immediate and long-term consequences of the current draught in basic research support.

A few rounds of funding at the present award rates will very quickly result in a reduction in the number of active laboratories to less than half their current number. Such a prospect must be viewed in the perspective of an extraordinary increase in the number of positions that will become available in the next 10 to 20 years in our academic institutions as a result of ordinary retirements. Common wisdom holds that, at the present rate of training, there will not be a sufficient number of competent scientists to fill these positions, let alone to provide the expansion necessary for U.S. science to compete effectively in the international arena. A reduction in the number of active laboratories, where the training of new biomedical scientists takes place, seems to be a most counterproductive approach to the problem.

Clearly, in a free-enterprise society, competition and selection are required to ensure a good return on the investment of resources. But selection that is too stringent can lead to irreversible damage. The strength of U.S. science is the breadth of its basis. This ensures that steady progress is made on a very broad front, enhancing the opportunity for the occasional giant steps that are taken in the form of conceptual or technical breakthroughs. Our broad scientific basis has also guaranteed the uninterrupted emergence of outstanding individuals in all of the varied fields that we have chosen to pursue; it is, without a doubt, responsible for our position of leadership in such fields as genetics and in every aspect of molecular biology.

Arguments are made that the human genome project will give birth to a new generation of technologies. What good will that do in the absence of individuals trained and capable of applying these technologies to traditional experimental systems, for the study of problems that will have remained refractory to analysis in human models, knowledge of the human DNA sequence notwithstanding?

AIDS research will probably have to be expanded before it is brought to fruition. The level of funding of the human genome project will increase significantly as the planned centers are established. A real danger is that Congress, while continuing to provide "new money" to support AIDS research, will maintain a no-growth cap on the other NIH appropriations because it will be deluded by the false perception that, in the human genome project, it is in fact supporting the type of science that the majority of scientists themselves have judged most worthy of support. This is simply not the case. The genome project (and AIDS research, for that matter, since it is as focused and mission-oriented an undertaking) has attracted some of the finest scientific minds in our country. It has also failed to attract or even interest some equally brilliant individuals. Both types of scientists have thrived until now in our diverse research environment. What will it be like if one type of scientist eventually supplants the other?

The present situation is unacceptable because it is harming a scientific plant that has taken many years to build to a level of world preeminence. Scientists of every persuasion, whether they are involved in the human genome project or whether they work with mice, flies, worms, cilliates, fungi, plants, or microorganisms, should be deeply concerned and should voice their concern. Legislators and public officials should be deeply concerned, as well, and should devise the means to remedy the situation as rapidly as possible, before irreparable damage is done, by steadily increasing, rather than decreasing, the level of funding for basic research.

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While Palca's article "Hard times at NIH" addresses the root cause of the current funding crisis facing investigators in the new and competitive renewal category, it does not provide a solution to the problem. Saying that the problem will pass in the next several years does not address the need for Congress and the scientific community to address the potential for continued underfunding in the future. Two sources of additional support exist—the freezing of indirect cost rates as suggested by the U.S. Department of Agriculture or the elimination of salaries for principal investigators as suggested by the National Science Foundation. In both cases, Congress would have to revise legislation requiring NIH to cover the full cost of research.

Both suggestions would have a significant impact on the research universities of this country. The elimination of the principal investigator's (PI's) salary might have the greatest overall impact. It would first put universities on notice that the federal government views research as an integral part of a faculty member's job and must be supported by the institution. Smaller colleges and universities, with hard money positions, would be able to attract researchers to their campuses. These active scientists could then serve as role models, potentially stimulating interest in science in a large untapped student population. Indeed, it might serve to eliminate the shortage of scientists predicted for the 21st century.

The shortage of funds available to support biomedical research at the present time is already forcing universities to either pay the salaries of previously successful investigators or to release them to take jobs at institutions with hard money positions. A formalization of this policy would translate into the ability to issue 5000 additional research grants. According to NIH, the average cost of a competing application is $200,000. Salaries account for 62% or $124,000 and principal investigator salary accounts for approximately 30% of this total, or $37,000. On the basis of 22,014 fiscal year 1988 awards, the potential reduction in requested budgets would be $815 million.

The elimination of the PI's salary and the freezing of indirect costs are not the answers to the problem facing the biomedical community. However, they are pieces of the puzzle that need to be moved about to ensure the continued vitality of the research establishment.

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In an otherwise excellent article about the serious funding problems for NIH-sponsored research, the assertion is included that "a steady rise in the dollar amount of individual grants [is] mostly due to an increase in indirect costs." The article quotes NIH correctly (*1*). Unfortunately, the way in which NIH portrays the data is misleading. Rather, the important analysis relates to indirect costs as a percent of total costs. When the data are analyzed this way, it is clear that over the past 5 years indirect costs as a percentage of total costs have remained stable or have declined. Specifically, NIH's own data show that as a percent of total costs indirect costs were as follows: 1984,

32.4%; 1985, 32.6%; 1986, 32.7%; 1987, 32.6%; and 1988, 32.2%.

There was an increase in indirect costs from 1979 (28.9% of total costs) to 1983 (31.7% of total costs) due largely to increased energy costs.

There is a critical problem of the increased inadequacy of the NIH budget to match the unprecedented opportunities in biomedical research. It would be unfortunate if we were sidetracked by straw men on this issue. The problem is very simply too little money and too little public recognition of the importance of biomedical research.

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One seldom hears praise for the Office of Management and Budget (OMB) from the scientific community these days, but Palca's article makes me think that some may be due. Palca describes how grant commitments from prior years have put a drastic squeeze on NIH funds for new grants in fiscal year 1990.

In fact, OMB foresaw this problem more than 2 years ago and sought to prevent it by requesting an extra $2.7 billion in fiscal year 1988 as an "advanced appropriation" to fund "outyear commitments generated by the award of competing research project grants" (*1*). Most members of the research community regarded the move with suspicion, seeing it as a ploy probably intended to draw attention away from the substantial reduction the Administration proposed in fiscal year 1988 funds for NIH. Congress ignored the request and granted NIH a fiscal year 1988 appropriation 19% above the Administration's request. The current squeeze is the result.

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REFERENCES

1. Intersociety Working Group, *AAAS Report XI: Research and Development, FY 1988* (American Association for the Advancement of Science, Washington, DC, 1987), p. 13.

To think that only 12% of *approved* new and competing NIH grant applications will be funded this year makes one wonder whether the peer review system has become obsolete and whether those who sit in judgment can impartially select from a pool of say 20,000 approved applications those 2400 that are worthy of funding. Las Vegas gives better odds of winning. Palca's article cites several, but not necessarily the most, important reasons responsible for the budget crunch. We are told that money is being diverted from new and competing grants (RO1s) to fund special projects (AIDS and other key projects) even if their priority score is below the cutoff point. New and competing RO1 grants have been reduced by 30% even though the total NIH budget has slightly increased. Why is there no stable pool for new and competing RO1 grants to support investigator-initiated research? How did the budget crunch of the NIH come about?

In my opinion, the most blatant causes are the escalation of indirect costs and of professional salaries charged to research grants. Indirect costs were never intended as a general subsidy of universities and research institutions but rather as a reimbursement for legitimate expenses arising from the operation of a research grant. The steadily rising indirect costs consume such a large portion of research grants that they undercut the base of the research grant programs. At the same time, university and institutional administrators urge principal investigators to charge major portions, or all, of their salaries to research grants in order to subsidize, indirectly, the hiring of new faculty. As a result, the salary budget requests have steadily increased. Yet, when one of the NIH institutes imposed a ceiling on individual salaries that can be charged to research grants, the resulting savings landed in the coffers of the federal treasury.

The internal budget allocations have become unstable and unpredictable. Annual budgets of previously approved research grants have been administratively reduced on short notice, in some cases by as much as 30%. If the present funding rate of 12% is applied to recipients of first awards, only one out of nine will have a chance to be funded the next time around, or one out of four if the funding rate is increased next year to 25%. Highly capable scientists with proven track records are forced to terminate productive research programs and to disband their teams. Clearly, things have gotten out of hand.

While peer review is still the best system of evaluating competing scientific proposals, it is practically incapable, and was never designed, to make funding decisions with such narrow margins. The most qualified scientists used to serve on initial review groups and NIH councils; however, the experience of denying support for three out of four approved applications has been so discouraging that many scientists refuse to serve again. Since the scientific enterprise of this country is so dependent on federal funds, the progressive decline of new and competing research grants can no longer be tolerated without severe consequences. It calls for a reordering of the priorities, the establishment of a stable support base for investigator-initiated research, and a determined effort to resist the drain of funds extraneous to the purpose for which the research grant program of the NIH was established.

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*Response*: Neurath is incorrect when he states that NIH will fund only 12% of approved new grants in the current fiscal year. The total number of approved new grants includes not only those ranked by study sections above an institute's payline—which for some institutes is now around 12%—but also grants with lower rankings that receive funds because they fall into priority research areas or because they are deemed necessary to maintain a balanced research effort. The percentage of approved grants funded will be closer to 24% for the current fiscal year.—JOSEPH PALCA

## Methanol-Powered Cars

Statements quoted in Eliot Marshall's News & Comment article "Gasoline: The unclean fuel" (13 Oct., p. 199) clearly imply that studies regarding the feasibility of using pure methanol to power automobiles are lacking. Yet Brazil has been using automobiles that run on pure alcohol since the 1970's. And guess who manufactures most of these automobiles? Ford, Chevrolet, Volkswagen, and others. The studies have already been done—these automobiles work and work well. How well they would work in our country and with our society is not known, but the vehicles and technology already exist. If our country were really interested in looking into the use of M100 automobiles, I think we could probably import some in a very short time.

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*Erratum*: In the article "Rockefeller braces for Baltimore" by Barbara J. Culliton (News & Comment, 12 Jan., p. 148), the pictures of David Baltimore and Joshua Lederberg were incorrectly credited. The credit for the Baltimore picture should have read, "M. Lampert, Boston." The credit for the Lederberg picture should have read, "Rockefeller University."