



## Reinvestment and recovery

**When US President Barack Obama declared in his 2009 inaugural address, “We will restore science to its rightful place,” many applauded. The US has led the world in research, innovation, and education in the medical sciences. The National Science Foundation, the NIH, and other government organizations involved in scientific investigations are the primary engines that have fueled this excellence over the past half century. Nevertheless, we cannot afford to assume that preeminence, or even excellence, will persist without attention and cultivation.**

At the 2009 Joint Meetings of the American Association of Physicians and the American Society for Clinical Investigation, Senator Arlen Specter received a Distinguished Service Award and standing ovations from the membership of these prestigious societies. The award was given in recognition of his long-standing support for biomedical research, including a pivotal role in securing \$10 billion in stimulus funding for the NIH as part of the American Recovery and Reinvestment Act (ARRA) of 2009. The award and the applause were symbolic of the widespread appreciation that is palpable among American scientists in response to continued public support.

The annual NIH budget is currently about \$30 billion, so the stimulus funds represent an enormous new investment. Prior to ARRA, the NIH budget was essentially flat between 2003 and 2008 (equating to an approximate 17% reduction in real purchasing power), after a period of dramatic increase (from \$13.6 billion in 1998 to \$27 billion in 2003). The plateau in spending resulted in dramatic reductions in the funding of new grants and very low pay-line percentages — sometimes in the single digits — for renewals of ongoing research projects and clinical trials. Our best and brightest students, facing bleak chances of independent funding, saw the discouragement of teachers and mentors and chose other fields, or other countries, for the pursuit of their budding careers. A series of high-profile scientists resigned positions at American academic institutions or government research centers and moved abroad, shifted to industry, or abandoned research programs. Scientific proposals became more conservative and less imaginative and innovative, because risky ideas were thought to be less likely to be funded in the most competitive of environments. In the short term, the bolus of ARRA funding will maintain the critical infrastructure of discovery and help to support the scientific

innovators who hold the promise for finding therapeutic breakthroughs.

The reinvigorated NIH budget has staved off disaster, at least for now. A veritable flood of new ideas and initiatives is flowing from the NIH, and investigators are working overtime to develop innovative proposals and programs to spur discovery, novel technologies, and new cures. The investment has already borne fruit through retained jobs, new positions, and rejuvenation of a plethora of support industries required for the pursuit of scientific investigation and clinical validation of new therapies.

Well-intentioned scientists, physicians, politicians, and others will debate the particular mechanisms by which the stimulus money and other NIH and National Science Foundation funds are utilized. Novel approaches have been and will be proposed; only some will succeed. The economic urgency to rapidly distribute and spend stimulus funds demanded that the process begin prior to the confirmation of Secretary of Health and Human Services Kathleen Sebelius or a permanent NIH Director. NIH centers and institutes have adopted various approaches and funding strategies, and the rapidly emerging (and constantly evolving) wealth of instructions, restrictions, and requirements associated with ARRA is dizzying. But while some might have preferred a more deliberative process, the economic imperative to rapidly award and spend the stimulus funds does not allow it.

Debate and discussion regarding the most productive ways to invest the public money, now or in the future, is healthy and should be encouraged. Some may choose to interpret criticism of a particular mechanism or investment philosophy (emphasizing “big science” like the Human Genome Project versus investigator-initiated research, for example, or basic science versus translational medicine and clinical trials) as criticism of the entire enterprise or as evidence

that productivity overall is lacking. This would be a dangerous mistake. Physicians and scientists are by nature inquisitive and dissatisfied with the status quo. We strive for knowledge and improvement. We must expect, even encourage, constructive criticism of our own approaches and institutions; we should not attempt to silence that debate. At the same time, we should acknowledge our unified and fundamental appreciation for the value of investing in scientific discovery and the health of our citizens. We treasure our excellence in education, training, and discovery, and we must strive to continue to lead the world.

The investment underway with ARRA is a terrific start. Additional bold legislation is required in order to allow this investment to fully pay its dividends. Without sustained reinforcement of the annual NIH budget in future years, jobs, programs, and potential will be once again at risk when stimulus funds are spent in less than 2 years. Rallying congressional and popular support for continued investment will take time, and the effort should begin now. The imperative is to avoid a sudden and sharp decline in ongoing spending that would result in retrenchment, despair, and unfulfilled promise; neither do we want the infrastructure and careers built with ARRA dollars to collapse when support is withdrawn. At the same time, the NIH budget cannot outpace inflation forever, and we must prepare now for a gradual leveling off of public investment in science, perhaps to 3% of the gross domestic product (as recently proposed by President Obama), and we must strive to leverage new discoveries to reduce health care costs.

Those of us who comprise the biomedical community must rally to actively engage our patrons, the public, and our policy makers to ensure that they appreciate the full value of scientific research. Innovative scientific inquiry has been, and will continue to be, a potent spark that ignites economic growth while at the same time enhancing quality of life.

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