

On the Same Page

October 12, 2009

Successfully Stimulated: Health Science Center Scientists...and North Florida

In early February 2009, Congress approved legislation to spend \$787 billion on fiscal stimulus (the “American Recovery and Reinvestment Act of 2009” or ARRA). ARRA was quickly signed into law by President Obama. The bill contains something for everyone, including scientists — \$10 billion for the National Institutes of Health, \$700 million for the Agency for Healthcare Research and Quality to conduct comparative effectiveness research, \$2.5 billion for the National Science Foundation and \$650 million for the Centers for Disease Control and Prevention for chronic disease control. All of these funds — about one-third of the current NIH budget — must be spent in this federal fiscal year and next.

Faculty in the HSC colleges seized the opportunity to submit applications for ARRA funding. There were very tight deadlines for a wide variety of grant applications, all vying for unprecedented amounts of money to be spent quickly over the next two years. Colloquially, this process amounted to drinking from an ARRA fire hose. And drink we did. In the four-month period between February and June, faculty from the HSC submitted around 400 ARRA applications — 290 with PIs from the College of Medicine (including several from the Jacksonville campus), and 110 from the other HSC colleges. Last week, the first batch of ARRA awards was announced, and the University of Florida Health Science Center was a big winner. In total, 75 awards were received, translating into \$72.1 million of funding over this fiscal year and next. Of this total amount, \$61.7 million was to the College of Medicine (including the Jacksonville campus), \$5.4 million to the College of Public Health and Health Professions, \$2.2 million to the College of Dentistry, \$1.6 million to the College of Pharmacy and \$1.2 million to the College of Veterinary Medicine.

A major contributor to the total was an award of \$29.5 million for the first two years of the six-year LIFE study, “Lifestyle Intervention and Independence for Elders,” in which the Principal Investigator is Marco Pahor, M.D., Director of the Institute on Aging and Chair of the Department of Aging and Geriatric Research. The full six-year award from the National Institute on Aging, totaling \$64.4 million, is the largest NIH grant in the history of the University of Florida. This study tests the hypothesis that physical exercise can reduce mobility disability in the elderly. The U.S. Department of Health and Human Services recommends that adults engage in at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity aerobic activity each week, as well as muscle-strengthening activities. Still, little is known about whether exercise can actually help prevent major mobility disability, defined as inability to walk a quarter of a mile or four blocks. For older adults, staving off disability could help them maintain their physical independence and enhance the quality of their later years. As Dr. Pahor states, “We all know that physical activity is good for our health, but the definitive evidence whether it can prevent disability in older people — whether you can prevent them from being unable to walk — is lacking.”

Let's put this in broader context, in terms of the nation and the North Florida region. In response to last autumn's financial tsunami, the United States has borrowed and printed money to fund an economic stimulus package and bank and corporate bailouts. Other countries have followed suit. The capital markets appear to be settling down and stimulus dollars are just beginning to enter the economy. Although we are in the midst of a deep recession, with unemployment rates that are still rising, a depression appears to have been avoided. The final chapters, however, are yet to be written as the unprecedented spike in money supply to thwart a deflationary spiral is being titrated against the prospect of future inflation.

Is NIH a logical target for a portion of the financial stimulus? In general — and I admit some bias in support of science — biomedical research not only creates knowledge that can lead to an improvement in health but also creates jobs that have ripple effects in the economy. During the last fiscal year, the NIH awarded almost \$23 billion in extramural research grants and contracts which, according to Families USA, created more than 350,000 new jobs nationwide. Moreover, these grants generated more than \$18 billion in wages from those new jobs, and spurred more than \$50 billion in business activity in the states. In the Gainesville area, the recent ARRA stimulus funds will create an estimated 1,100 jobs, and — if the national data can be generalized — should add \$57 million in wages and about \$150 million in regional business activity.

There are other benefits to increasing NIH funding as part of an overall federal stimulus package: first, there are beneficial downstream effects on the population's health, longevity and productivity; second, the funds are distributed to a variety of localities throughout the country, without the inefficiencies of political earmarks; third, a merit system for awarding funds to the best applications is already in place; and fourth, through the Bayh-Dole Act, incentives exist for the development of commercializable discoveries.

The availability of these funds comes at an important time when research enterprises such as ours, which have grown in response to the doubling of the NIH budget several years ago, must now have sustained baseline funding to avoid teetering under the weight of their own infrastructure and overhead. We should also step back from this, however, and ask: "OK, I know that the reason this research funding must be spent quickly is to create jobs as part of the economic stimulus package. But then it goes away. What happens then? What *should* happen?"

Viewed strictly from the perspective of external support for the UF research mission, the huge bolus of NIH funding outlined above is indeed reason to celebrate, and we would all be wearing a big smile were it not for the fact that the overall economy is in deep recession (albeit getting worse at a slower rate). These additional research funds are in fact long overdue given that the expansion in NIH funding nationally came to a screeching halt after 2003 and has been essentially flat since then. Theoretically, these stimulus dollars will generate research programs that will continue when the funding ends in 13 months. Some of the capital expenditures under ARRA that will create new facilities and upgrade scientific cores may indeed create immediate jobs and enhance future productivity. The research itself is a continual process of inter-digitated scientific stories, however. These stories involve

hypotheses, experiments and data analysis, advancing knowledge in small steps, punctuated importantly by some “eureka” moments. This process doesn’t end when the bolus funds are spent; if the research has any merit, it will generate additional scientific questions. Thus, a good “shovel ready” project in biomedical science will yield not an endpoint in 18 months but a new beginning. No doubt, additional NIH (or similar) funding will be needed to sustain the stimulated scientific enterprise, so that it can produce even more knowledge, more jobs and, hopefully, more improvements in health.

Clearly, a durable commitment to science is needed that will be shielded from the political process of annual congressional budget negotiations. Such a commitment must include the education of the next generation of investigators who can have some reasonable expectation that funding opportunities will be available to them at the end of their training. Unfortunately, our history of boom-and-bust NIH cycles and the continual increase in the age at first R01 (now 43 years old) do little to instill the confidence needed among our best and brightest young people to enter biomedical research as a career.

We now have a proponent of science in the White House who might indeed foster a radical change in the benchmarks we use to fund scientific research. In recent years, as GDP has increased while the budgets for NIH, NSF and other federally funded research agencies have remained flat, the proportion of GDP spent on research and development has been declining. Last year, this figure for the U.S. was estimated to be 2.6 percent. By contrast, for example, Israel spends 6 percent of its GDP on research and development. Strikingly, in a speech before the National Academy of Sciences on April 27, 2009, President Obama advocated that the nation spend 3 percent of its GDP on science. Given that the U.S. GDP is currently \$13.84 trillion, this implies a goal of spending \$415 billion on science, an increase of about \$55 billion from the current level of 2.6 percent.

If indeed the U.S. makes a commitment to spend a fixed percent of its GDP on science (biomedical, physical, behavioral, environmental, etc.), a sustained circle of economic stimulus may result, with an increase in GDP spurred by an investment in science in turn generating more dollars for scientific investment. Such a commitment will attract new talent to the field of scientific research, allow universities and research institutes to plan in a more rational manner, and lead in general to a brighter future for future generations as a result of the discoveries and advances that will ensue. We all look forward to replacing our current drink from the ARRA fire hose with an adequate, balanced and stable diet of research support that will most effectively nurture research and development of biomedical discoveries over the long term, with the goal of improved health for all of us.

Go Gators!

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