SCIENCE POLICY

Looming Budget Cuts Threaten U.S. Research Advances

For decades, U.S. researchers have been working to solve the elemental secrets of human health and disease: the function of the immune system, the triggers for cancer, the remarkable plasticity of pluripotent stem cells. Today, says University of Pennsylvania Senior Vice Provost for Research Steven J. Fluharty, the life sciences have come to a transformative moment—only to find historic progress threatened by deep federal budget cuts that could be just weeks away.

At a Capitol Hill briefing organized by AAAS, Fluharty joined other science leaders urging Congress and the White House to avert the "sequestration" that could slash the U.S. investment in research and development by 8.4%—some $58 billion—by 2018. Cuts of that magnitude, they said, would jeopardize work in areas such as genetic medicine, advanced manufacturing, and batteries that could allow a 10-fold increase in the range of electric cars.

"We're talking about dramatically reducing the rate of discovery and innovation in this country, which has traditionally been the lifeblood of our economy," said Fluharty.

The 14 November briefing reflects broad outreach by the U.S. science and engineering sector that has intensified as each day gets closer to the so-called fiscal cliff. As elected officials search for a debt-reduction compromise by year's end, both parties have signaled support for research investment.

AAAS has been prominent in the effort, providing detailed budget analysis, building alliances with other S&T organizations, and working with lawmakers. The AAAS Office of Government Relations has established a Web site to provide background on the potential budget cuts (www.aaas.org/go/sequester). And AAAS Chief Executive Officer Alan I. Leshner has detailed the importance of federal R&D in publications ranging from the *Washington Post* and the *Sacramento Bee* to Germany's weekly *Die Zeit.*

"AAAS is a leading voice for the scientific enterprise," Leshner said, "and we have a responsibility to ensure that lawmakers and the public understand the severe consequences if these cuts take effect."

The sequestration deadline is the result of a 2011 compromise among lawmakers that averted a budget crisis by allowing an increase in the federal government's debt ceiling. Under the deal, if lawmakers can't reduce the deficit on their own, automatic sequestration cuts kick in.

Matt Hourihan, director of the AAAS R&D Budget and Policy Program, described for the bipartisan, standing-room-only Capitol Hill audience the potential impact on top federal science agencies. At the Department of Defense, R&D would fall 9.1%, or $33.5 billion, over 5 years. The Department of Energy would lose 8.2%, or nearly $4.6 billion. Both the Department of Agriculture and NASA would lose 7.6%, with NASA's R&D funding falling to its lowest level since 1988.

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A plan approved in the U.S. House of Representatives would exempt defense from sequestration, but that would mean cuts of 17.5% for nondefense R&D. While that's unlikely to advance, profound concerns have galvanized science and engineering associations, universities, and others in the U.S. research community.

One key focus: the projected cut of 7.6%, or $11.3 billion, to R&D at the National Institutes of Health (NIH). Research!America, the medical and health research advocacy alliance, reported 77% of respondents to its recent national public opinion poll favored federal funding for research to improve the health care system. Nearly 70% favor increased federal support for scientific research that advances knowledge and drives innovation.

The Federation of American Societies for Experimental Biology warned that the cuts would be "devastating." NIH would fund 2300 fewer medical research grants in 2013, the federation said, forcing lab closures and tens of thousands of layoffs. Earlier this month, its call for action generated more than 8000 e-mails to Congress.

Whether this combined effort is as large as past campaigns is uncertain. "There are so many more players today than there were back in the 90s, and we've learned a lot of lessons," said Joanne Carney, director of the AAAS Office of Government Relations. "We've matured, and we have a more sophisticated view of how best to advocate for science."

But the message this fall is inherently pragmatic: Reduced funding means reduced discovery and reduced benefits for society. And that could undermine a new generation of scientists and engineers just as they are coming into the professions. The nation can't afford such losses, experts said at the Capitol Hill briefing.

The world is growing more competitive, and other countries are investing heavily in R&D, said Orlando Auciello, formerly of Argonne National Laboratory and now Endowed Chair Professor at the University of Texas at Dallas. "So you have to tell your representatives in Congress: 'This is not red or blue… If we don't work for the United States of America, we're going to be in trouble.' "

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INTERNATIONAL

Uzbek, U.S. Scientists Plan to Expand Partnerships

Top U.S. and Uzbek scientists explored potential research collaborations in human health, agriculture, and environmental sciences at a 3-day conference convened by AAAS in Tashkent.

Uzbek and U.S. scientists have worked together previously on cotton and clean water research, and participants from both countries were enthusiastic about expanding collaborations in genomics, proteomics, and climate change.

Microbiology and solar energy research are also emerging as promising fields for cooperative science, said Norman P. Neureiter, senior adviser to the AAAS Center for Science Diplomacy and acting director of the AAAS Center for Science, Technology and Security Policy. "Uzbekistan has a collection of opportunities for considerable cooperative work," he said.

These opportunities have grown steadily since a 2010 Science & Technology Cooperative Agreement signed by the U.S. and Uzbekistan, as well as a 2011 visit to the country by U.S. State Department science envoy and former AAAS Board member Alice P. Gast.

More than 70 researchers and dignitaries, including Shavkat Salikhov, president of the Academy of Sciences of the Republic of Uzbekistan, and U.S. Ambassador George Krol, attended the 27 to 29 September meeting. Former AAAS President Gilbert S. Omenn and current AAAS Board member Inder Verma also spoke at the conference; it was organized by Gwenaële Coat, a senior program associate at the AAAS Center, and Uzbek Academy researcher Ibrokhim Abdurakhmonov.

The role model for many gathered in Tashkent is a decade-long collaboration in cotton genetics between the U.S. Department of Agriculture (USDA), Texas A&M University, and the Uzbek Academy of Sciences. Abdurakhmonov and Texas A&M's Alan Pepper described how the program has produced high-quality studies and supported a remarkable cotton-breeding program in a country at the same chilly latitude as Chicago.

Joy Ward, a University of Kansas professor, is pursuing collaborations with senior Uzbek scientists to focus on important plant genes that may respond to environmental change. She and many others also spoke about expanding international opportunities for the next generation of Uzbek researchers. "We need to bring more early-career scientists to conferences like this one, as they are the hope for continued collaborations between our nations."

Many of the researchers noted the need for funding to move these partnerships beyond the talking stage, said Jacqueline Fletcher, an Oklahoma State University scientist who pointed to the USDA program as an inspiring example. "Uzbek and U.S. scientists share many common goals and productive interactions are often easy to envision, but consistent financial resources are needed to engage and continue that engagement over time," she said.

"I think, currently, we—both the U.S. and Uzbek sides—must concentrate on finding the funding resources for the collaborations intended," Abdurakhmonov agreed. "This requires good ideas and continual discussion."

The researchers plan to continue their discussions and define specific cooperative projects at a meeting in the United States in 2013.

—*Becky Ham*

COMMUNICATION

AAAS Kavli Science Journalism Award Winners Named

Stories about microbial hitchhikers, the largest dam-removal project in North America, and issues raised by the new era of personal genomics are among the winners of the 2012 AAAS Kavli Science Journalism Awards.

Large Newspaper—(Circulation of 100,000 or more): Carl Zimmer, freelance writer, for stories published in the *New York Times:* "Evolution Right Under Our Noses" (26 July 2011); "A Sharp Rise in Retractions Prompts a Call for Reform" (17 April 2012); and "Tending the Body's Microbial Garden" (19 June 2012). The judges praised Zimmer's entry as an example of sustained excellence in reporting on a range of science topics.

Small Newspaper—(Circulation less than 100,000): The judges declined to give an award in the small newspaper category this year.

Magazine: Michelle Nijhuis, freelance writer, for "Crisis in the Caves," published July/August 2011 in *Smithsonian* magazine. Nijhuis went underground to observe both bats and biologists as she reported on white-nose syndrome, which has killed more than a million cave-dwelling bats in the northeastern United States.

Television—(Spot News/Feature Reporting, 20 minutes or less): Sheraz Sadiq, KQED QUEST (San Francisco), for "Hetch Hetchy Aqueduct: Big Fixes for Big Quakes," 9 November 2011. With historical footage and on-the-scene reporting, Sadiq explained the engineering steps being undertaken to protect the San Francisco Bay Area's water supply.

Television—(In-Depth Reporting, more than 20 minutes): Sarah Holt and Laurie Donnelly WGBH/NOVA, for "Cracking Your Genetic Code," 28 March 2012. The journalists' entry told about the emerging field of personalized medicine—where success and failure often intermix—through the eyes of a cancer patient, a cystic fibrosis sufferer, and others.

Radio: Bari Scott, Alex Chadwick, Mary Beth Kirchner, Robert Rand, and Robin Wise, Sound-Vision Productions for American Public Media, for "Particles: Nuclear Power After Fukushima," 11 March 2012. The program revisited the Fukishima disaster to show "energy issues through the lens of personal experience."

Online: Lynda V. Mapes, Steve Ringman, and Genevieve Alvarez, *The Seattle Times*, for "Elwha: The Grand Experiment," 17 September 2011. Their series covered the $325 million project to remove two dams that have blocked salmon runs for more than a century on the Elwha River and to restore 800 acres of former reservoirs in Washington State's Olympic Peninsula.

Children's Science News: Kirsten Weir, freelance writer, for "Uninvited Guests," published in *Current Health Kids,* April/May 2012. Weir mixed compelling statistics and humor in her lively tour of the trillions of microbial stowaways on the human body.

The awards, administered by AAAS since their inception in 1945, go to professional journalists for distinguished reporting for a general audience. The Kavli Foundation provided a generous endowment in 2009 that ensures the future of the awards program.

Independent panels of science journalists pick the winners, who will receive $3000 and a plaque at the 2013 AAAS Annual Meeting in Boston in February. Learn more about the winning entries at www.aaas.org/sja2012.

—*Earl Lane*

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ASSOCIATION AFFAIRS

AAAS Members Elected as Fellows

In October 2012, the AAAS Council elected 701 members as Fellows of AAAS. These individuals will be recognized for their contributions to science and technology at the Fellows Forum to be held on 16 February 2013 during the AAAS Annual Meeting in Boston, Massachusetts. The new Fellows will receive a certificate and a blue and gold rosette as a symbol of their distinguished accomplishments. Presented by section affiliation, they are:

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