

AIBS news

Source: BioScience, 60(7) : 557-560

Published By: American Institute of Biological Sciences

URL: <https://doi.org/10.1525/bio.2010.60.7.15>

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AIBS *news*

JULY/AUGUST 2010 / VOLUME 60 NUMBER 7

AIBS Members Visit Congress

Biological scientists traveled to Washington, DC, in April to meet with members of Congress about the importance of federal investments in fundamental biological, agricultural, and environmental research. The scientists and graduate students were in the nation's capital on 21–22 April as part of the annual BESC/CoFARM (Biological and Ecological Sciences Coalition/Coalition on Funding Agricultural Research Missions) Congressional Visits Day (CVD).

Among this year's participants were scientists affiliated with AIBS member organizations, including the Organization of Biological Field Stations, the Ecological Society of America, and the Poultry Science Association. The recipients of the 2010 AIBS Emerging Public Policy Leadership Award also participated. Graduate students Meredith Niles, of the University of California, Davis; Ryan Richards, of the University of Maryland, College Park; and Leslie Smith, of the University of Rhode Island, were recognized for their initiative and leadership in science policy.

The CVD event began with a briefing by senior staff from the National Science Foundation, US Department of Agriculture, and Congress. Policy staff from AIBS, the Ecological Society of America, and the Crop, Agronomy, and Soil Science societies also provided participants with an analysis of the federal budget and advocacy training. A reception followed the budget briefing and advocacy training program. On 22 April, participants fanned out across Capitol Hill for meetings with representatives and senators. This year, the group emphasized the importance of federal investments in research that will help the nation respond to grand challenges, such as those identified by

the National Research Council in *Biology for the 21st Century*. The report highlights the need for research to help address the issues of food, environment, human health, and energy.

Register Now for the Second Annual Biological Sciences Congressional District Visits Event

AIBS is pleased to announce an opportunity for scientists to inform the nation's science policy. This August, AIBS—with the support of event sponsors Botanical Society of America, Genetics Society of America, the Long Term Ecological Research Network, the Society of Systematic Biologists, the University of Michigan Biological Station, and event supporter Jasper Ridge Biological Preserve—Stanford University—will convene the 2nd Annual Biological Sciences Congressional District Visits event. This nationwide initiative is an opportunity for scientists to meet with their members of Congress in their home states to demonstrate how science is conducted and why sustained federal investments in research are vital to the nation's global leadership in science.

The second annual Biological Sciences Congressional District Visits event will be held throughout the month of August 2010. Each August, representatives and senators spend time in their congressional districts and home states. This event is an opportunity for scientists and representatives of research facilities to meet with their members of Congress in their home states to demonstrate how science is conducted and why a sustained investment in research and education programs must be a national priority. Participating scientists will either meet with their elected officials at a district office or may invite them to visit their research facility.

Participants will be prepared for their congressional meetings by AIBS Public Policy Office staff. Training for this event will be conducted through an interactive Webinar program. In addition, participants will receive information about federal appropriations for biological and environmental research, tips for conducting a successful meeting with an elected official, and resources to craft and communicate an effective message. The AIBS Public Policy Office will provide participating scientists with guidance and assistance with scheduling meetings. Individuals are also encouraged to coordinate their participation in this event with their institutions' government relations offices.

Participation is free, but registration is required and space is limited. Register at www.aibs.org/public-policy/congressional_district_visits.html. Organizations interested in sponsoring the Biological Sciences Congressional

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Recent Articles Online at www.actionbioscience.org

Recent Public Policy Reports Online at www.aibs.org/public-policy-reports

doi:10.1525/bio.2010.60.7.15

District Visits event this year or for 2011 should contact AIBS director of public policy Robert Gropp at 202-628-1500 x. 250 or rgropp@aibs.org.

AIBS Writes to President, Congress in Support of Biological Sciences

In April, AIBS wrote to policymakers in the White House and Congress about the need to prioritize federal investments in the biological sciences.

AIBS wrote to the White House Office of Science and Technology Policy regarding President Obama's grand challenges of the 21st century. The president's list of "hard, unsolved scientific or engineering challenges that will have significant economic or societal impact and address an important national priority" included issues in human health, renewable energy, materials science, computer science, and education. AIBS encouraged the White House to include several additional grand challenges: food security, healthy ecosystems, cataloging biodiversity, and access to federally managed scientific data. Tackling these challenges would drive innovation in human health, natural resource management, and science education, and would contribute to economic growth.

AIBS also provided testimony to the House Committee on Appropriations in support of increased funding for the National Science Foundation (NSF) in fiscal year (FY) 2011. AIBS expressed support for the president's budget request of \$7.424 billion for the NSF in FY 2011, a 7 percent increase over last year. AIBS also called attention to the valuable research and education programs provided by NSF's Biological Sciences Directorate. More specifically, the testimony highlighted the proposed funding increases for Graduate Research Fellowships, digitization of natural science collections, and the construction of NEON (the National Ecological Observatory Network).

To read either of these statements and other AIBS statements, please visit www.aibs.org/position-statements/.

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AIBS Cosponsors Climate Science Briefing

On 11 May, AIBS cosponsored a climate science briefing for congressional policymakers. The purpose of the briefing was to clarify the state of climate science for policymakers. Recent events, including the publication of private e-mail correspondence between climate scientists and the examination of the Intergovernmental Panel on Climate Change (IPCC), have led some to question certain climate change research results, the ethics of practicing scientists, and even the efficacy of scientific processes. The briefing provided policymakers the opportunity to discuss with scientists the peer-review process, research processes, statistical analysis, and how the IPCC conducts its studies and assessments.

The briefing featured panelists Richard Alley, professor of geosciences at Pennsylvania State University; Warren Washington, head of the Climate Change Research Section at the National Center for Atmospheric Research; and Richard Smith, professor of biostatistics at the University of North Carolina, Chapel Hill. The briefing was cosponsored by 13 scientific and professional societies, including AIBS members Ecological Society of America, American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America. Other organizations cosponsoring the briefing were the American Association for the Advancement of Science, American Chemical Society, American Geophysical Union, American Meteorological Society, American Statistical Society, Geological Society of America, National Ecological Observatory Network, and University Corporation for Atmospheric Research.

FAMRI-funded Research Helps Harness Cancer-killing Viruses

The Flight Attendant Medical Research Institute (FAMRI; www.famri.org), a not-for-profit organization, sponsors scientific and medical research to combat diseases caused by exposure to tobacco smoke.

Since 2001, FAMRI has relied on Scientific Peer Advisory and Review Services (AIBS SPARS) to manage large- and small-conference peer-review meetings that have marshaled the wide-ranging expertise of hundreds of reviewers and funded nearly 500 projects addressing the prevention, early detection, treatment, and cure of the diseases and medical conditions caused by tobacco smoke.

Diffused among healthy cells, especially at early stages, and growing out of control, cancer cells are difficult to target precisely. As a result, traditional anticancer therapies are blunt instruments: chemotherapy can affect fast-growing but healthy cells such as bone marrow, hair, and skin; radiation cannot always be focused precisely; and lumpectomies may miss malignant or premalignant tissue.

But in a series of elegant and innovative FAMRI-funded studies, Yuman Fong of Memorial Sloan-Kettering Cancer Center is harnessing the propensity of viruses to cause cell death, and aiming that propensity at cancer cells. He is designing viruses that selectively infect tumor cells and can kill them within hours.

Viruses capture cells' replicating machinery and produce thousands of viruses until the infected cell bursts, or lyses, releasing the new viruses and spreading infection. A cancer cell is a virus's perfect target: Its replicating machinery is out of control; it has no protective "off" switch. Fong's laboratory focuses on engineering viruses (herpes simplex 2, adeno, vaccinia, myxoma, and vesicular stomatitis) that specifically infect and lyse cancer cells (oncolytic viruses), while sparing normal cells.

In a FAMRI-supported 2004 study, the investigators used a herpes simplex virus called NV1066 that they engineered to contain a gene for green fluorescent protein (GFP). They wanted to use the modified virus to infect early cancer cells and cancer cells in hard-to-reach tissues such as nerves. It did just that, and only the cancer cells with the GFP glowed green.

These experiments showed that viruses can be used to improve early

detection and identification of cancer, and to help guide surgical resection. "In animal and in human studies, [the viruses] have been able to detect one tumor cell in a background of one million normal cells, a 50 times improvement over traditional cytology," the principal investigator wrote.

This work has global ramifications. The investigators in Fong's lab point out that through this technique, the cancer cells that become virus-tagged and glow green under the appropriate light source can be seen by personnel with minimal training using low-tech, inexpensive machines. Fong suggests that these qualities may make the techniques appropriate "even in rural areas of developing nations where cigarette smoking is still popular," enabling the detection of many types of cancers, including lung, oral, pancreatic, and stomach. This technique could be immediately applicable worldwide.

Building on the success of previous work, another FAMRI-supported study by Fong and colleagues, conducted in 2007, continued this work, with an added twist. They asked, "What cellular change in the process of malignant transformation allows the virus to selectively infect the cancer cell?"

Fong and colleagues have carried out a great deal of FAMRI-funded research; they have been working steadily since 2004 to develop oncolytic viral therapies, some of which are now entering phase 1 clinical trials.

2010 NESCent/AIBS Evolution Symposium: Molecular Insights into "Classic" Examples of Evolution

The 2010 NESCent/AIBS Evolution Symposium, "Molecular Insights into 'Classic' Examples of Evolution," will be held Friday, 5 November, from 1:00 p.m. to 5:00 p.m. at the National Association of Biology Teachers Professional Development Conference in Minneapolis, Minnesota. The speakers will be:

- Edmund D. Brodie III, professor of biology and director of Mountain

Lake Biological Station, University of Virginia, Charlottesville, Virginia.

- Sean B. Carroll, professor of molecular biology, University of Wisconsin–Madison, and soon-to-be vice president for science education at Howard Hughes Medical Institutes.
- Hopi E. Hoekstra, John L. Loeb Associate Professor of Natural Sciences, Department of Organismic and Evolutionary Biology, Harvard University, Cambridge, Massachusetts.
- Allen G. Rodrigo, director, National Evolutionary Synthesis Center, Durham, North Carolina.

An educators' workshop will take place the following day, Saturday, 6 November, from 9:00 a.m. to 12:00 p.m., providing teaching resources and strategies to integrate molecular evolution into the classroom. For complete details, go to www.aibs.org/events/special-symposia/molecular_insights.html or contact Susan Musante at smusante@aibs.org.

Recent Articles Online at www.actionbioscience.org

Original articles in English

- "What Do We Do with Too Many White-tailed Deer?" by Thomas Rooney. Too many deer create problems for people and wildlife management. Rooney, of Wright State University, explains how white-tailed deer density increases environmental damage and adds to costly community and agricultural headaches. He summarizes options to address deer overabundance. Read the article at www.actionbioscience.org/biodiversity/rooney.html.
- "The Challenge of Living at High Altitudes," by Cynthia Beall. Many people suffer altitude sickness when traveling to higher altitudes. In this interview, Beall, of Case

Western Reserve University, talks about how highlanders in the Andes and Tibet have adapted to the environmental stress of living in high plateaus. Read the article at www.actionbioscience.org/evolution/beall.html.

“Technology: An Educational Issue?” blog posts

This blog about issues in educational technology and discusses ways to learn and teach the biological sciences using technology at <http://teachissues.blogspot.com/>. Recent posts and discussions include:

- Making tracks challenge
- Science buddies science fair ideas
- Jeopardy labs

Spanish translation of a previously posted article

- “Estudios de Caso: un Instrumento para Captar el Pulso de la Historia de la Ciencia” [Tapping into the Pulse of the History of Science with Case Studies], by Douglas Allchin, of the University of Minnesota. In this article, Allchin explains why historical case studies are a vital tool for teaching scientific reasoning and skills, the human and cultural dimensions of science, and perspective for scientifically informed decisionmaking. Read the article in Spanish at www.actionbioscience.org/esp/educacion/allchin.html and in English at www.actionbioscience.org/education/allchin.html.

Recent Public Policy Reports Online at www.aibs.org/public-policy-reports

Public Policy Report for 26 April 2010

- **House committee to consider COMPETES Act reauthorization.** The House Science and Technology Committee is expected to consider (“mark up”) legislation on 28 April that would reauthorize the America COMPETES (Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science) Act. On 22 April, Committee Chairman Bart Gordon (D-TN) introduced HR 5116, which is a combination of legislative proposals developed by the panel’s various subcommittees.
- **Scientists visit Capitol Hill: Support NSF, USDA research.** Biological scientists traveled to Washington, DC, in April to meet with members of Congress about the importance of federal investments in fundamental biological, agricultural, and environmental research. The scientists and graduate students were in the nation’s capital on 21–22 April 2010 as part of the annual BESC/CoFARM (Biological and Ecological Sciences Coalition/Coalition on Funding Agricultural Research Missions) Congressional Visits Day.
- **NSF, NIH offer new Bridging the Sciences Program.** The National Science Foundation and the National Institutes of Health are

offering two new research grants that aim to support cutting-edge, visionary research at the interface of the life, physical, mathematical, and computational sciences. The “New Biomedical Frontiers at the Interface of Life and Physical Sciences” grant will support interdisciplinary basic research that may create entirely new areas of biomedical investigation. The “Transforming Biomedicine at the Interface of Life and Physical Sciences” grant will support interdisciplinary research with clinical or translational implications.

- **NRC, NAS release reports on ocean acidification, GMO crops.** The National Research Council and the National Academy of Sciences have released reports on the impacts of ocean acidification on marine ecosystems and the impacts of genetically modified crops on US agriculture. *Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean* makes several recommendations for policymakers, including the need for an integrated ocean acidification observation network, research in eight broad areas, data management, and engagement with stakeholders. *Impact of Genetically Engineered Crops on Farm Sustainability in the United States* found that farmers are realizing economic and environmental benefits by growing genetically engineered crops, including lower production costs, less use of pesticides, and higher yields.