

The Obligation for Biologists to Commit to Political Advocacy

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I explain here why all scientists should feel obligated to do their part to support the community by advocating for the benefits of government investments in scientific research and training.

The work of most biological scientists depends heavily on governmental funding, and this support stands in competition with every other program that receives government funds. Historically, biologists took for granted that politicians would provide adequate funding, given the virtue of advancing human health. Complacency was the norm because the budgets of the National Institutes of Health (NIH) and National Science Foundation (NSF) generally increased at or above the level of inflation during the second half of the 20th century, and the budget of the NIH doubled between 1998 and 2003. Unfortunately, funding has stagnated since 2003, so taking inflation into account, the purchasing power of the NIH budget has declined about 20% over the last decade (AAAS, 2012; also see <http://www.aaas.org/spp/rd/> for regular updates.)

Times have changed for the worse for two reasons. First, the global economic recession has done real damage to science. Weak tax revenues and growing deficits have led politicians to compromise funding for research in spite of the established benefit of basic research for stimulating economic growth. The situation in the United States for 2013 is particularly dire. The failure of Congress to adopt a deficit reduction program in 2011 resulted in a fall-back option called sequestration, which may reduce federal funding across the board by 8% on January 1, 2013. If this comes to pass, we face widespread unemployment in the biological research community and the loss of many valuable research

programs. Second, although US citizens still hold science and scientists in high esteem (Masci, 2009), some politicians use ideological opposition to scientific findings (evolution and climate change to cite two examples) to take anti-science positions.

In our present situation, advocacy for support of science must be a priority, perhaps even an obligation, for every biologist. Our community must take responsibility to convince politicians that funding biomedical research will benefit not only human health, but also our economic well being. The objective of advocacy for biomedical research is to help elected officials focus on the merits of our work, which is quite different from partisan politics. Voting and participation in electoral politics are separate obligations of citizens in a democracy.

Who Makes Decisions about Science Funding?

The US Congress decides how much money to appropriate for all federal programs (Box 1). Very few scientists hold elected positions at either the state or national level. For example, the 112th US Congress (2011–2012) includes four scientists (all in the House of Representatives) and 24 MDs (5 in the Senate and 19 in the House). They are outnumbered by 200 lawyers (52 in the Senate and 148 in the House) and 209 businesspeople (28 in the Senate and 181 in the House) (CQ Roll Call, 2010).

Consequently, members of the US Congress have a low level of technical and scientific expertise. Most lawmakers

admire scientists, and many are even apologetic about not having studied science since high school or an introductory course in college. Without scientific training, they are prone to distraction by the many other interests clamoring for their time and support. Among recent presidents, Barack Obama is the most supportive of science, but we are short of science champions in the current Congress.

Who Advocates for Federal Funds?

Advocates are an integral part of the legislative process in Washington. Advocacy by individuals and organizations is the norm, and these diverse voices have powerful influences on setting priorities for all forms of government spending. This practice is less common outside of the US, or at least less exposed in public. The powerful, self-interested advocates in the US include defense contractors, oil companies, banks, insurance companies, churches, gun control groups, gun rights groups, large and small businesses, education, labor unions, transportation companies, agriculture, casinos, universities, medical schools, doctors, construction companies, arts organizations, senior citizens, and a long list of other lobbies. Groups with deep pockets employ teams of paid lobbyists to spread their message.

Politicians must get elected, and financing a run for office is an integral though sometimes unsettling aspect of campaigns. Campaign contributions can buy influence, given the money to run a campaign (on average, more than \$1 million to win a seat in the House and

almost \$10 million to win in the Senate). By law, not-for-profit organizations cannot campaign for candidates or make political contributions. However, virtually every organization benefitting from federal or state funding lobbies elected officials, and those allowed to contribute (sometimes vast) sums to election campaigns at the state and national level. If the organization's agenda aligns much more closely with one of the major political parties than the other, their support can become a partisan issue, rather than a nonpartisan issue. Think of gun rights and the Republican party (R) or labor unions and the

Democratic party (D). Many organizations contribute to opposing candidates in an election, hoping that the winner will support their causes.

Why Are Scientists on the Sidelines?

In spite of being highly educated and seeking support for a worthy cause, scientists as a group are among the least engaged in advocacy. Some scientists are complacent because they live and work in an urban center with a major educational institution that is already represented by a highly supportive member

of the House of Representatives. Other scientists are intimidated, feeling that they would not know how to talk with an elected official or his or her staff. Many think that their single voice cannot make a difference or that they lack the stature to be effective. Some mentors deny their trainees the opportunity to participate in advocacy because they would miss time from the lab. Other scientists feel that advocating for science is unbecoming or self-serving.

None of these excuses holds water. Even if your House member supports biomedical research, he or she needs to

Box 1. The Pathways of Actions Required to Fund a Research Grant by the Federal Government and by the NIH

Left Pathway. The Steps by the Federal Government to Appropriate Funds

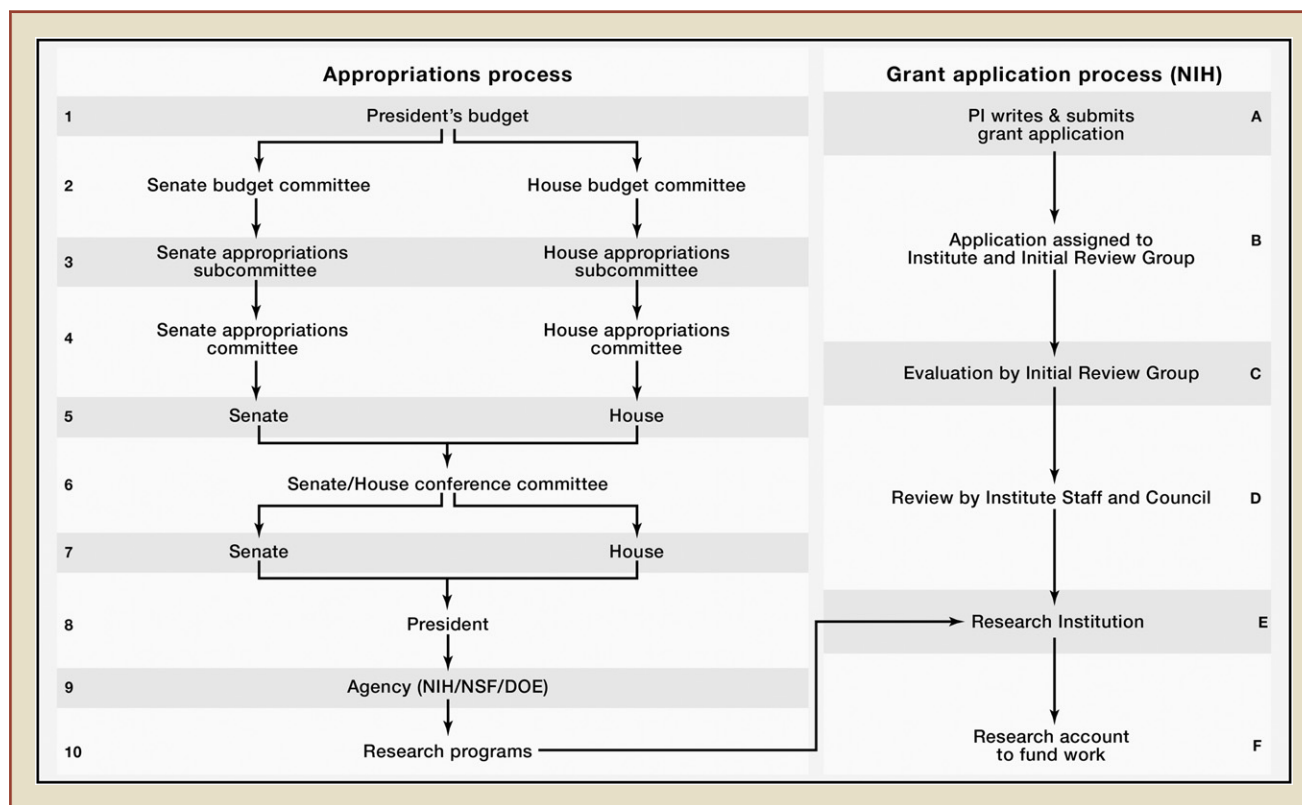
Federal appropriations in the US are made annually, so each step is required every year. Congressional committees are renewed every 2 years after each national election. The first three steps take place reliably in the winter and early spring, but the later steps are often delayed beyond the end of the fiscal year, September 30, owing to disagreements within and between the two houses of Congress.

- (1) The White House Office of Management and Budget assembles a financial plan for the entire federal government, which the President presents to Congress as a proposed budget. The federal agencies advocate for themselves inside the executive branch during the formulation of the President's budget. External advocates can also work with the administration on this plan. Presidents often submit low budget proposals for NIH, with assurance that Congress will improve the appropriation.
- (2) The House and Senate Budget Committees create their own budget proposals, setting a total level of spending and dividing that money among the large subdivisions of government such as Defense, Health and Human Services, Transportation, and so on. Depending on which party has the Presidency and controls the two houses of Congress, these budget committees may build upon or ignore the President's budget when creating their own budgets. These budgets put overall constraints on federal expenditures. External advocates may attempt to influence this division of total spending, but ideology usually predominates at this stage.
- (3) All appropriations bills originate in the House. Subcommittees of the appropriations committees of the House and Senate consider how to divide their total spending allotment established by their Budget Committees. At hearings, they receive input from leaders of the various federal agencies as well as external advocates. Individuals and groups also work behind the scenes with subcommittee staff to push for favorable outcomes. Committee chairs have considerable influence in drafting appropriation bills that may include stipulations about how the money is to be spent, so each program requires support from these individuals.¹
- (4) Full appropriations committees review subcommittee bills before sending them for consideration by their respective houses of Congress.
- (5) Members of the House and Senate debate, amend, and vote on appropriation bills. This is the main chance for most legislators to weigh in on appropriations bills, given that few of them serve on appropriations committees or subcommittees. If Congress fails to pass appropriation bills by the end of the fiscal year, they approve one or more "continuing resolutions" to fund agencies at the level of the previous year for a limited time, sometimes stretching to months. These delays are awkward for the funding agencies because they do not know how much money they have to operate. This uncertainty can delay funding of specific grants and programs.
- (6) Appropriations bills from the House and Senate are never identical, so the next step is for powerful lawmakers from both houses to form a joint Conference Committee to reconcile the bills (http://en.wikipedia.org/wiki/United_States_congressional_conference_committee). Members of these conference committees can strongly influence appropriations at this step, emphasizing the ongoing need for help from champions of both houses.
- (7) Both houses vote to approve the compromise bill.
- (8) The President then signs or vetoes the entire bill. If vetoed, the bill goes back to Congress.
- (9) Agencies divide their appropriations among their programs, taking into account restrictions or specific funding allotments for specific programs mandated in the appropriation bill.

Right Pathway. The Steps in Funding a Grant by NIH

The internal review process differs at NSF, but other steps are similar to NIH. (a) The scientist writes and submits a grant application, (b) which is assigned to an Institute and Initial Review Group (study section), (c) reviewed by the IRG (with feedback to the applicant), (d) and reviewed by the Institute staff and Council before (e) funds are transferred to the applicant's institution (f) to set up a research account to pay for personnel, supplies, equipment, services, etc. required to do the research.

¹In the current session of Congress, appropriations committees have the following leadership. The chairs of the Full Appropriations Committees are Representative Harold Rogers (R, KY) and Senator Daniel K. Inouye (D, HI). The chairs of the Appropriations Subcommittees on Commerce, Justice, Science, and Related Agencies (responsible for NSF) are Representative Frank R. Wolf (R, VA) and Senator Barbara Mikulski (Democrat, MD). The chairs of the Appropriations Subcommittees on Labor, Health and Human Services, Education, and Related Agencies (responsible for NIH) are Representative Denny Rehberg (R, MT) and Senator Tom Harkin (D, IA). Other members of these committees can be found at <http://appropriations.house.gov/> and <http://www.appropriations.senate.gov/>.



be urged to become a champion for NIH and NSF, and your two US Senators may not be equally supportive and should be contacted. Scientists usually have an advantage in conversations with politicians, who may be embarrassed by their lack of scientific knowledge. Scientists, especially youthful scientists, usually make a positive impression on members of Congress and their staff. No one should be ashamed to promote funding of scientific research. Discoveries in biology not only drive improvements in healthcare, but also benefit the economy. For example, the \$3.8 billion investment in the Human Genome Project between 1988 and 2003 has been estimated to generate \$796 billion in economic activity in the US between 1988 and 2010 (Gitlin, 2011). Even the lowest estimates of economic return from government investments in NIH are in the range of 2 to 1 (Ehrlich, 2011). Universities that are dependent on research support from NIH and NSF are the largest employers in communities from Tucson, Arizona to Little Rock, Arkansas to New Haven, Connecticut. So many regional economies benefit from investments in research.

Who Advocates for Biomedical Research?

The most powerful advocates for biomedical research in the US are voluntary health organizations such as American Cancer Society, American Heart Association, and Juvenile Diabetes Association. Their volunteer members and professional staffs are passionate about particular diseases. They tend to be highly focused on short-term advances in treatments that can help their families and friends, but some appreciate that a lack of fundamental knowledge is commonly the limiting factor in advancing treatments. Research!America is the leading volunteer organization advocating broadly for biomedical research. They keep track of public opinion and publicize the broad public support of biomedical research.

Prior to 1990, few scientific societies took political positions or lobbied for funds. They left advocacy to the leaders of their institutions, who worked through their professional organizations, Association of American Universities (AAU, the leading research universities) and American Association of Medical Colleges (AAMC, medical schools). Both organizations

have been effective advocates for policies that allow their member institutions to be successful, although their priorities can differ from the members of their faculties.

Since 1990, most scientific societies have developed active public policy efforts, and some are well organized to help their members be good advocates. The pioneer in this effort was the Federation of Societies of Experimental Biology, which for several decades has organized an annual conference of their participating societies to reach a consensus recommendation for appropriations for the federal science agencies. Another group of societies formed an advocacy organization called Coalition for Life Sciences (CLS). Since 1991, the Congressional Biomedical Research Caucus sponsored by CLS has hosted talks on Capitol Hill by more than 275 biologists. Currently this bipartisan Caucus has four cochairmen: Brian Bilbray (R, CA), Rush Holt (D, NJ), Jackie Speier (D, CA), and Charlie Dent (R, PA). In addition to hosting events, Caucus leaders encourage their fellow lawmakers inside and outside of the Caucus to vote for legislation that is essential for biomedical research.

Historically, science has been a nonpartisan issue, with both Democrats and Republicans serving as boosters for research. Any legislation, particularly bills that appropriate federal funds, requires champions inside of Congress. Our champion during the 1990s was Representative John E. Porter (R, IL), who chaired the appropriations committee that funded NIH. He was recognized with the Lasker Award for his contributions to biomedical research and is now chairman of Research!America. During the first decade of the current century, Senator Arlen Specter (R, Pennsylvania) looked out for NIH as a member of the appropriations committee. Several times, his personal intervention was essential for increasing the appropriation for NIH, most notably an extra \$10 billion over 2 years for NIH in the American Recovery and Reinvestment Act of 2009. Neither of these friends remains in Congress. Our current champion is Senator Tom Harkin (D, Iowa), but he needs help in the House of Representatives. Without strong support in both houses of Congress, science budgets are unlikely to be a priority during budget negotiations in this tight fiscal year.

Call to Action

Given that the well being of biomedical research depends on funding from the federal government and given the stiff competition for support from many other groups that receive government funds, every biologist should feel obliged by his or her own self-interest and our worthy cause to be an advocate for science. Strong participation is particularly important for young scientists, including graduate students and postdocs, because their futures depend on adequate funding. The already competitive academic job market and grant application process will only worsen if funding continues to decline in real dollars. Furthermore, young people are remarkably effective advocates. Politicians are used to older advocates in suits and ties, so the appearance of a group of enthusiastic grad students and postdocs in a politician's office will be disarming and make a strong impression. Helping out is, of course, the right thing to do, but young people should be highly motivated to participate by self-interest, as their futures are at stake.

Getting involved is easy because support is already in place to help scientists to participate. Here are five obligations for every biologist to take seriously.

Obligation 1: Join a Professional Society with an Advocacy Program

Your dues will not only give you access to the society's scientific, mentoring, and placement programs, but will also help to fund their public policy and advocacy programs. National professional societies exist in most areas of biology and virtually every clinical specialty and subspecialty. Some of the larger basic science societies are American Physiological Society, American Society for Biochemistry and Molecular Biology, American Society for Cell Biology, American Society for Microbiology, American Society for Pharmacology and Experimental Therapeutics, Biomedical Engineering Society, Biophysical Society, Genetics Society of America, and Society for Neuroscience. Many of these societies collaborate as members of CLS and/or FASEB.

Obligation 2: Join Your Society's Grassroots Advocacy Network

Volunteer and respond to requests to communicate with elected officials. Your society will keep you up to date on the status of important legislation and will contact you when your voice needs to be heard. When action is necessary, your society will explain the issue and give you a sample letter for you to customize with information about you, your work, and your concerns. Participation is open in some biology advocacy groups, such as the Congressional Liaison Committee (CLC) of the Coalition for Life Sciences (<http://www.coalitionforlifesciences.org/>). You can join in the "other" category. Many societies have software to help advocates send e-mails to elected officials (and to keep track of participation). Paper letters to local congressional offices can also be helpful, but getting paper mail to Washington offices of Congress has been slow since the anthrax attack in 2001. A telephone call is another simple option, particularly if time is crucial. You can look up your elected official's telephone numbers on the web, and you may be surprised to find that a pleasant, interested staff member takes your call and registers your message.

Many scientists assume that their communications with elected officials will be a drop in the bucket and will not

count for much. However, even a very small number of letters/e-mails can have an impact. Five or ten letters will definitely be noticed. Fifty letters or calls to one office will have a huge impact. Your friends in your department could generate that many letters.

Obligation 3: Volunteer to Help Your Society with Advocacy

One especially important task is to recruit labmates, parents, and friends to join grassroots networks. If you are a professor, encourage your students, postdocs, and technical staff to get involved. The small amount of time that they will spend on advocacy will be a good investment and might even make a difference in getting funds for the lab.

Enlisting relatives and friends as advocates is particularly important for scientists working in urban areas, where elected officials are often committed to supporting science. On the other hand, the politicians in one's suburban or rural hometown without a major educational institution in the district may have never heard from a scientist. The contrast in scientific advocacy between urban and rural areas is striking. For example, in 2011, CLC members in California, New York, Pennsylvania, Illinois, Massachusetts, and Connecticut sent between a total of 3,000 letters to lawmakers, whereas the total number of letters to politicians in Nevada, Alaska, Arizona, Delaware, Idaho, Maine, Mississippi, New Mexico, North Dakota, South Dakota, and Wyoming was less than 75. These states with little activity are vital to our cause because each one has two US Senators. The relatives of a couple of biologists in each one of these states could make a difference.

Obligation 4: Visit Your Elected Officials at Home or in Washington, DC

Many societies hold organized Capitol Hill Days, where groups of scientists visit a number of Congressional offices. Often the scientists will meet with staff assigned to health or science affairs, but often the Representative or Senator will join the conversation. Each participant will take 1–2 min to introduce themselves and their work to start the conversation. Your enthusiasm about your work and your concerns about federal funding will register whether you see staff or the lawmaker. When you return to the lab,

you can use the energy gained from your visit to Congress to motivate your friends and colleagues.

Elections are always on the minds of lawmakers, so they are attentive to constituents. You can visit their local offices to explain your work and your personal concerns. Many societies will help to arrange a visit to the local office of your Representative and Senators, but a simple telephone call will result in an appointment in many cases. Take along five or six friends and colleagues of all ages. Explain why the lawmaker's active support for science is important to you, your institution, and your community. They will be particularly interested in how the competition for federal grants impacts employment in their district.

Obligation 5: Let Elected Officials Know about Funding of Grant Applications

This powerful idea proposed by Larry Goldstein (Goldstein, 2010) creates a missing feedback loop in the system, where we depend on the support of politicians for funding but essentially never let them know the outcomes of our requests for funds. Every applicant for federal funds should thank their elected officials when a grant is funded, or, if the application is not funded, one should politely explain the effort put into the application and the impact of the lack of funds on the research and employment in the laboratory. Opening the eyes of elected officials to the local consequences of declining federal funds may make them more likely to support appropriations in the future. I hope that the grants and contract offices in each of our institutions can help faculty make this feedback loop a routine part of the federal funding process.

Other Opportunities Vote for and Support Political Candidates Who Appreciate the Value of Science in our Society

Researchers should be aware of elections for the US House of Representatives and US Senate. The candidates' websites, voting records, and speeches will usually reveal their positions on federal funding

of scientific research. If not, one can attend a town hall meeting or political event and ask candidates directly about their positions. Participation is important because a question from a scientist will remind politicians that most voters support federal funding for biomedical research. Private citizens are allowed to contribute to political campaigns locally and nationally, including those of the few scientists in Congress and the champions of federal research funding. After the election, scientists should encourage their Representative to join the Biomedical Research Caucus. A list of current members can be found at <http://www.coalitionforlifesciences.org/>. (Note that, by traditions in Congress, some of our strongest supporters do not participate in caucuses, owing to their service on budget or appropriations committees.)

Community Outreach

The general public also needs to hear more about the value of science in society, so scientists should take every opportunity to participate in "Science Cafés" (<http://www.sciencecafes.org/>) or speaking opportunities to alumni groups or local service clubs. Running a Science Café requires some work, but they are remarkably popular. We have one in my town (<http://www.tildecafe.org/>). Another opportunity is to author an op-ed or a letter to the editor in your local newspaper. One type would point out the benefits of federal science funding in your community, as taxpayers appreciate knowing that their taxes are being used for good purposes. Other submissions could thank local politicians for voting for increases in science funding or explain the local impact of poor appropriations. The staff of your scientific society can help.

Invite Elected Officials to Visit Your Laboratory

Visits from politicians are exciting but require coordination with your institutional leadership, who may feel that it is inappropriate for a faculty member to offer such an invitation. Therefore, consult with the leadership of your institution and your governmental affairs office before proposing a visit to a politician.

A Career in Science Policy

Scientists who are interested in a career in science policy have attractive options. One is to spend 2 years in Washington, DC as a Science and Technology Fellow. The American Association for the Advancement of Science manages this highly influential program in partnership with more than 30 science and engineering societies (<http://fellowships.aaas.org/>). Over the past 40 years, more than 2,000 scientists and engineers have participated as AAAS Fellows by working in Congress or a federal agency. Scientific expertise provided by these fellows directly influences attitudes and legislation. Some fellows return to the lab, but many use the fellowship to launch exciting careers in government, National Research Council, scientific societies, voluntary health organizations, or advocacy. Many of these organizations also offer internships or fellowships to help individuals get started.

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