

# PRESIDENT'S REPORT

Science in the United States is at an important crossroad. Decisions taken in the next year or two are certain to affect the health and welfare of every American citizen as well as the ability of this country to continue to claim a leadership position in science and technology. Our challenges include improving the quality of science education and teachers, rekindling interest in science among our young people, easing immigration of scientists and engineers from abroad who continue to bring an indispensable vitality to U.S. research efforts, and most important restoring public support for basic science which has eroded measurably in recent years. Each of these issues affects the viability of the research enterprise here at Cold Spring Harbor Laboratory and at other leading scientific institutions across the country.

This year is a U.S. presidential election year and despite the importance of each of these issues, science has for the most part flown below the radar of public discourse. The American people certainly support science and scientific research in general, yet science does not enter into the national debate as much as it should. Not only Americans, but also all people in the world today face multiple threats to public health and to the natural environment. It is scientific research that provides us with the means to cope with these challenges, which are nothing short of existential. But science is not just a tool for addressing specific challenges. As an approach to understanding nature, the world in which we live and life itself, it steadily advances the frontiers of our knowledge and our capabilities and is thus a fundamental tool of human progress.

No one disputes that the products of the scientific enterprise generate benefits for everyone. But these accomplishments are often taken for granted. Nearly every American child and most adults now use the Internet. But, because the online world has become "second nature," we scarcely remember, much less actively contemplate, the wise policies that led our government to consistently support the computer science and physics research that made the Internet possible.

Major advances in physics, engineering, mathematics and computer science emerged from national efforts to compete in the space race that began in the late 1950s. At that time, politicians and public policy leaders, in consultation with scientific advisors, effectively articulated national goals that embraced science. Today, in the formulation of national policy, science has become an enterprise that is discussed mainly in times of crisis and scientists are low on the list of policy advisors consulted. Preparedness is a critical element for successful crisis management and it is therefore unfortunate that the societal commitment to funding a scientific infrastructure that is prepared to meet the challenges of society has waned.

As pointed out in an important 2007 National Academy of Sciences report entitled *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, the United States is falling far behind its major competitors in supporting education and research in the physical sciences, engineering and mathematics. If this "gathering storm" persists for much longer, the infrastructure for these sciences will be irrevocably damaged. The National Academy report made some important recommendations to our nation's leaders, but little has been done to implement them.

Although biology and medicine thus far have survived the reductions in federal government support that have cut deeply into the programs of their sister sciences, the fact remains that during the past 5 years Federal support for biomedical research has been reduced. In that span, the budget of the National Cancer Institute (NCI), for example, has not received any increase. In fact, it has been severely reduced if we take the effect of inflation into account. If the President's proposed budget for 2009 is implemented, the real purchasing power of NCI funding will have shrunk by 19% by the end of next year, relative to its value in 2004. What does this mean? The NCI Director has warned that the shrinkage threatens to make grants "meaningless," impairing the ability of basic and clinical investigators to achieve their stated goals with allotted resources that are constantly eroding over time.

The irony is breathtaking. This reduction in support comes at a time when real benefits in cancer research are emerging from work performed during the last two decades. Data from the American Cancer Society show that the cancer-related death rate per 100,000 Americans has been decreasing for the last 10 years, particularly for lung, colorectal and breast cancer. Such advances are not serendipitous but are rather the direct product of intensive basic and applied research over decades, made possible only because of a societal consensus regarding the importance of keeping financial support robust.

This is not the time to cut back on research. Rather, it is the right time to invest. New technologies, such as RNA interference (RNAi), mouse models for human cancer that accurately reflect the response that patients have to the illness, and genomic approaches to identifying new targets for therapy and diagnosis—all so prominently applied at Cold Spring Harbor Laboratory, as described in the pages of this report—are now being integrated into new strategies for cancer research and therapy. We are also now combining tools developed for cancer research to begin to unravel the mysteries of the brain and neurological diseases such as autism, schizophrenia, and Alzheimer's. At the same time, basic research remains our priority because it is the source of our future advances in both basic and applied research.

Reduction in funding not only limits what existing researchers can do, but it also discourages new scientists from pursuing science as a career. Undergraduate and graduate students very rapidly detect the anxious state of their professors when research funds become scarce. If a new generation of students in America is not thinking about a career in research, in short order the very fabric of American science will be compromised.

During the past 5 years we have experienced belt-tightening as have nearly all scientists across the country. Cold Spring Harbor Laboratory, however, has been able to survive and prosper due to the generosity of private donors who value our commitment to conducting outstanding research and education programs. Significant accomplishments in autism, schizophrenia, and cancer research have been supported either entirely or substantially by philanthropy. We are profoundly grateful for that support, but at the same time, we are obliged to raise a warning flag about public support for research over the long run.

Public support of science is vitally important because it complements the philanthropic support that enables great science to begin. For this reason, it is time to place science high on the list of public priorities. CSHL is in a position to challenge investigators—both those who work here and those who attend our meetings—to take an active role in public education and bring scientific discussion from laboratories into classrooms and living rooms in our community and across the country. It must be part of how we educate and train scientists today and in the future. We do this for our graduate students in the Watson School of Biological Sciences. This should be only the beginning of our efforts in this direction.

CSHL is also in a position to empower teachers and students of all ages by providing technological means with which they can enjoy easy access to real-time science. The Dolan DNA Learning Center (DNALC) is the key to the success of such an initiative. Through the DNALC and our educational and public affairs outreach, we must continue to broaden the population that we reach with our programs and resources.

If we at CSHL take a more proactive role in fulfilling our responsibility to society by pursuing these steps with fervor, we stand to succeed in continuing our own institution's leadership role in research. We will also be fulfilling our civic responsibility as scientists and citizens. If a concerted effort by scientists and scientific institutions to draw the public into what each of us has personally experienced as the wonder and promise of science is absent, we must ask: Can we realistically expect to overcome the national complacency that threatens the long-term stability of research activity in the United States?

CSHL has always been a leader and we have never shirked our responsibility to push science forward. As we continue to fulfill our research and education missions, let us not forget the importance of bringing the public along with us on our collective journey of discovery for the benefit of humankind.