Testimony before the House Science Committee:
"Conducting Research During the War on Terrorism:
Balancing Openness and Security"

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Chairman Boehlert, Congressman Hall, Committee Members - Good morning and thank you for inviting me here today to discuss the important and timely issue of balancing openness and security in research. I am pleased to testify on behalf the University of California.

As Chancellor of the University of California Santa Cruz, a research biologist, a former Associate Director for Science in the White House Office of Science and Technology Policy, a past President of the American Association for the Advancement of Science, and a member of the National Academies' Committee on Science and Technology for Countering Terrorism, I have by necessity reflected on these matters, as do my colleagues throughout the research community.

I am honored to be on this distinguished panel and to have had the opportunity to hear from Dr. Marburger this morning. Dr. Marburger, as you have heard, is an articulate and thoughtful member of the Bush Administration, and those of us in the science and technology community are grateful for his wisdom.

I just spent the past two days in Pittsburgh with Dr. Marburger, other government officials, and principles from the university and industry communities at the Council on Competitiveness meeting. The topic of this meeting was balancing national productivity and homeland security. In his address to the Council, Director of the White House Office of Homeland Security Governor Tom Ridge said that American society is free, open and welcome and that innovation is our greatest asset. Governor Ridge emphasized that our nation's homeland and economic security are intricately linked. America cannot remain competitive if we cannot remain innovative. The case for balance between the openness that fosters innovation and our concerns for security is the subject of today's hearing.

This past spring, I delivered the Carey Lecture here in Washington before the American Association for the Advancement of Science on a similar topic. My speech was entitled, "Risky Business - Research Universities in the Post September 11 Era." The essence of my message remains the same as I address you today. I come before you as a member of the research community to further strengthen the partnership between the federal government and the research community and to build upon our many achievements.
Leading a public research university since September 11th has been an illuminating and transforming experience on many levels. My conviction remains strong that universities must continue to play a critical role in understanding and preventing terrorism in the next generation. In order to do so, we must be mindful to balance requirements for increased security with the freedoms of American academia that have benefited everyone in this room.

Research universities play a unique role in working on the solutions to problems posed by the new threats to our homeland. Our scientists and professors educate and train students who will become the next generation of informed and engaged citizens, scholars in all disciplines, professionals and leaders in all fields, and of course, the scientists and engineers who will help us face the tremendous challenges that lie ahead.

We should take care not to break what works well and not to attempt to fix what isn't broken. Some of the questions this Committee and others in our government, including Dr. Marburger, are grappling with include whether and how to define "sensitive" areas of research and whether and how to restrict who should be allowed to engage in those research areas. I hope to help answer some of the questions this morning.

A year ago September, the U.S. science and technology community knew that research universities would have a key role to play in ensuring the future safety of our country, as we have over the past half century. We also knew that we would have to re-examine the ways we operate, including considering proposals for changing the way we are accustomed to working.

As we consider and implement changes in how research is conducted, we should be mindful of the delicate balance that must exist between openness and security. Maintaining that balance could be considered a science itself. We must take care not to tip the scales unnecessarily and thus risk the enormous benefits of a free and open environment in science and research.

Perhaps it is helpful to remember that we have faced these issues before:


> It is the policy of this Administration that, to the maximum extent possible, the products of fundamental research remain unrestricted. It is also the policy of this Administration that, where the national security requires control, the mechanism for control of information generated during federally-funded fundamental research in science, technology and engineering at colleges, universities and laboratories is classification.

As recently as eleven months ago, Condoleezza Rice, Assistant to the President for National Security Affairs, cited the Reagan directive in a letter:

> The key to maintaining U.S. technological preeminence is to encourage open and collaborative basic research. The linkage between the free exchange of ideas and scientific innovation, prosperity, and U.S. national security is undeniable. This linkage is especially true as our armed forces depend less and less on internal research and development for the innovations they need to maintain the military superiority of the United States. In the context of broad-based review of our technology transfer controls
that will begin this year, this Administration will review and update as appropriate the export control policies that affect basic research in the United States. In the interim, the policy on the transfer of scientific, technical, and engineering information set forth in NSDD-189 shall remain in effect, and we will ensure that this policy is followed.

If a research project is designated "classified," the determination about who can engage in the work and which findings will be published openly has historically been made by the federal government. Our universities and research communities have and can continue to work under that construct.

From the university standpoint, if a federal agency designates research as "classified" research, then we know we must treat that research project differently. General practice of the University of California, as with most universities, is not to accept contracts for classified research because restrictions on publication are contrary to the freedom to publish. At UC, any classified research is conducted off-campus.

I should add here that I am speaking about UC's research policy as it applies to our ten academic campuses. As the Committee knows, as part of our public service mission, the University of California also manages three national laboratories under contract to the Department of Energy. At two of these labs, Lawrence Livermore and Los Alamos, the preponderance of the research is classified and the scientists in those labs work under a different set of protocols, expectations and requirements than scientists on the academic campuses. My testimony here today addresses the issues of openness and security in the campus research setting only and is not intended to reflect on the national laboratories where strict policies and practices related to national security have always existed.

Scientific openness has enabled the vast majority of advances in civilian applications and innovations in the last 50 or more years. Our scientific and technological strength is also one of our best national defenses. It is precisely because our fundamental science base is so broad that we have been and are able to respond in a sophisticated fashion to national catastrophic threats whether they are caused by terrorism or by uncontrollable natural disasters.

I am not here today to suggest that the nation's universities should simply be left alone but rather to try to inject a note of caution about overreacting. Trying to put into place new restrictions to prevent research in areas where an imaginary scenario might suggest a danger is probably not productive. We should consider new areas of classification only where there are real agreed-upon threats.

Earlier this year, the news media reported that in its initial attempts to assess the threat of terrorists developing harmful chemical, biological or other agents of mass destruction, the Office of Homeland Security expressed an interest in requesting, or requiring limitations in scientific publishing, especially the publication of data sets and methodologies that might lead to replication of certain results. The risks and benefits of such actions must be clearly understood.

The traditions and structure of research in the U.S. today depends on replication and refutation, which means that sufficient data and methods to allow that must be published in peer-reviewed journals. Such publication also mitigates fraudulent results, sloppy science, and political biases.
guiding important policy decisions. Recent, well-publicized incidents of scientific misconduct underscore the merits of this system.

Open communication of results also influences our national policies in environmental and health issues. We cannot imagine environmental or health policies that are not based on the open access and review of research data.

Of course there are circumstances that may warrant restrictions, but the onus for blocking publication should be on the government through a process that is clearly defined, free of arbitrary edicts, and understood by the research community.

Balancing the perceived risks of open access with the risks to the health and vitality of the research community is exactly the kind of issue that calls for a new partnership between the research community and the government. To date this partnership has been sustained but in our intensity to protect our nation, we must be vigilant to ensure its stability.

Mr. Chairman, I do not believe that it would serve the best interests of the knowledge enterprise for agencies to create a grey area of research called "sensitive but unclassified" and treat that category of research differently than unclassified research.

The best way to sort out these issues is to work directly with experts in the various scientific fields and scientific societies. The experts are well-equipped to help determine if something is sensitive or dangerous and may need to be withheld from the public domain for any amount of time by classifying the work.

Through much of our national security history, but especially since World War II, national security priorities have had a strong influence on national science policy. The events of September 11th represent the beginning of another era of great change.

History can inform us about how to engage with our government in meaningful ways in helping to set national science policy that maintains and strengthens the science and technology research enterprise.

In the Cold War era, we focused on the control of fissile material and the control of technology for delivering those materials. Although complex in its details, the problem was rather straightforward. Now, we are dealing with a much more complicated set of issues because we are concerned about materials such as biological organisms and agents, materials which may be more commonplace and which exist in nature, materials for which there may be everyday use, materials that in one person's hands, might compose a life-saving drug, but in another person's hands, might constitute a weapon of terror.

As President Bush reminded us earlier this week in his national address, biological and radiological threats are a grave reality in our world. We recognize that potent biological agents can fall into the wrong hands and those of us in the research community must share in the responsibility of preventing that from happening. Clearly this responsibility is recognized as you have heard from Dr. Atlas.

Our nation's scientists have traditionally stepped up to the plate when needed to work toward
national goals, and clearly this happened again after last September 11th. More than 125 of our nation's distinguished science and technology experts volunteered to work together through a committee of the National Academies to develop a research agenda for countering terrorism. No one who was asked to serve, including me, declined the invitation.

In June of this year, our committee issued a report entitled, "Making the Nation Safer: The Role of Science and Technology in Countering Terrorism." The report advises:

America's historical strength in science and engineering is perhaps its most critical asset in countering terrorism without degrading our quality of life. It is essential that we balance the short-term investments in technology intended to solve the problems that are defined today with a longer-term program in fundamental science designed to lay foundations for countering future threats that we cannot currently define. These long-term programs must take full advantage of the nation's immense capacity for performing creative basic research, at universities, government laboratories, industrial research facilities, and non-governmental organizations. A dialogue should take place between the federal government and the research universities on how to balance the protection of information vital to national security with the requirement for the free and open environment in which research is most efficiently and creatively accomplished. This dialogue should take place before major policy changes affecting universities are enacted.

I hope I have satisfactorily explained my position and our universities' policies on this topic.

Now let me turn to the issue of what has changed since the Cold War.

First, we are no longer the only nation that can provide access to specialized information. As the recent NSF science and engineering indicators note, several decades ago, the U.S. produced more than twice the number of PhDs than any other nation. Today, the European countries outproduce us and the Asian universities are approximately even. Thus, in some ways, expressed concerns about preventing international students from studying "sensitive" areas is a modern version of closing the barn door after the horse has left. We would be much better advised to strengthen our overall science and technology enterprise than to try to restrict access. We are at least as likely to have to mount a response to a program that was derived from another nation's science and technology base as from our own. The only way to be prepared for that is to have the very best talent, no matter its origin, here in our country. A short review of our national defense history will quickly show that many of the most important national security programs had their origins in the fundamental research programs done by immigrant scientists.

Second, as so frequently noted, the current terrorists do not represent a nation state and thus strategies of containment are not those of the Cold War. We may be able to restrict access to facilities and agents but we will be unable to completely protect against individuals who are prepared to conduct suicide missions. Thus, while science and technology can help with hardening strategies and in new, sophisticated detectors and in areas of concern with cybersecurity for example, we cannot expect that we will have equal success in the more sporadic terrorist events that have plagued our allies for decades.

And finally, Governor Ridge, in his Pittsburgh address earlier this week, quoted our enemy Osama bin Laden as saying to his followers "concentrate on the destruction of the American
economy." We must be sure not to inadvertently aid our enemy in this effort.

I am convinced that our universities have much to offer to the protection of our homeland and the war on terrorism. Mr. Chairman, it is clear that you and the Committee recognize the contributions of science and technology to the war on terrorism. The university and research communities appreciate your commitment and the commitment of this Committee to work together with us to address the new challenges we all face.

Facing up to our new dangers and opportunities will require the best of America, and the best of what research universities can offer. Mr. Chairman and members of the Science Committee, let me be clear - America's universities want to continue to be a part of advancing our national security and prosperity.

Again, thank you for the opportunity to come before you today to present this testimony and I look forward to any questions you may have.

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