Testimony

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Mr. Chairman, Ranking Member Ehlers, and members of the Subcommittee, my name is James Calvin, and I am the interim vice president for research at Texas A&M University. Good morning and thank you for including me in this prestigious list of speakers. I am honored to be representing universities in testifying about the role of non-governmental organizations and universities in international science and technology cooperation.

Background

As one of the select few universities with the land-, sea- and space-grant designations, Texas A&M has a long history of supporting the three-fold mission of research, teaching, and public service at a research intensive university. The globalization and diversification of research and education is a natural extension of this traditional mission and is in fact one of the university's key imperatives outlined in *Vision 2020*, the university's effort to attain consensus top-ten status among public universities by the year 2020. Through its globalization and diversification efforts, Texas A&M is able to provide a more well-rounded education for our students, ensure that our faculty have the ability to engage in collaborative research with the leading researchers throughout the world, and promote Texas A&M as a research hub that encourages the best and the brightest from around the world to pursue their education within the United States. The result of these efforts is that Texas A&M has been able to produce graduates that are better prepared to compete within the global marketplace, recruit top-level faculty members, and leverage local and national research support through international partnerships as well as further developing a positive international reputation.

Demographics

Texas A&M has a student population of 46,542 (37,357 undergraduate and 9,185 graduate students) studying in over 250 degree programs in 10 colleges. Among these students, we have 4,025 international students from 124 countries. While a great number of these students come from Mexico, China, Taiwan, South Korea, and India, we also have students from Bhutan, Croatia, Eritrea, Macao, Yemen, and Togo.

During this academic year, Texas A&M hosted 577 foreign faculty scholars, representing 74 countries. Many of the faculty come to Texas A&M as a result of the relationships established through formal Memoranda of Agreement (MOA), while others visit our campus as a result of personal relationships with Texas A&M faculty established through usual scientific exchanges. Today, we have 132 active MOAs with universities and research institutions in 45 countries. We are also currently in the process of formalizing nearly 30 additional MOAs.

Texas A&M operates a branch campus in Doha, Qatar offering four undergraduate engineering degrees in Chemical, Electrical, Mechanical and Petroleum Engineering. In addition, research and graduate programs will soon be established at the Qatar campus. This campus is supported

by private funding, as the Qatar Foundation underwrites our efforts in Doha. No taxpayer or tuition money is used to support this effort. When offering a degree from Texas A&M, either in College Station or in Doha, the curriculum requirements are the same. Thus, undergraduate students must complete six hours in American history and six hours in political science.

We also maintain two overseas centers in Italy and in Mexico City and are currently establishing a third center in Costa Rica. The university is also a part of the network of 27 federally funded national centers for International Business Education and Research, maintains an Office for Latin American Programs and an Institute for Pacific Asia and has received funding from the European Commission to establish one of the 10 European Union Centers of Excellence in the United States.

Although Texas A&M has research and educational relationships all over the world as well as the physical presences in Mexico, Italy, Qatar and Costa Rica, we have chosen to focus particular emphasis on three regions: the Middle East, Asia, and Latin America.

Role and benefit to Texas A&M of participating in international research and education cooperation

The workplace and the scientific landscape have become increasingly global. No country can maintain a monopoly on scientific discoveries or on a trained work force. Thus, it is incumbent upon universities such as Texas A&M to engage this global environment so that we can lead instead of follow. The value of globalization can be seen in all three components of our mission—research, teaching and public service. Because of Texas A&M's commitment to diversity and globalization and its varied international initiatives, we have better prepared students, globally competitive research programs, and a long history of giving back to the world community. Our graduates are better prepared, more rigorously trained and have a broader perspective upon which to draw as they enter the marketplace. Our research efforts have a broader impact and the resources that can be used for research are leveraged. The area where impact is arguably the greatest, but the least mentioned, is within the realm of public service. By working on problems of bilateral or multi-lateral interest, we can help to develop solutions to practical problems that can provide immediate impact and provide an avenue for economic development. All of this allows Texas A&M to provide increased capabilities and value to the state and the nation, while simultaneously helping to develop strong partnerships with our key regions of collaboration.

Our various study abroad programs and opportunities as well as our efforts at our international campuses and centers in Qatar, Mexico, Italy and our emerging campus in Costa Rica play vital roles in helping our students prepare for life after graduation. However, providing international experiences to 46,000-plus students is an inconceivable mission if we limit ourselves to only sending students to foreign locations. Having more than 4,000 international students on our main campus allows Texas A&M a significant opportunity to create global experiences for a broad set of our students and provides experience possibilities that do not require students to be able to afford the additional cost of a student abroad opportunity. For example, the Muller International Host Program (MIHP) was started by some students out of the Academy for Future International Leaders who started by taking international students home for holidays. The purpose of MIHP is to provide international students the opportunity to interact with a local family from the United

States. This allows students to gain a better understanding of U.S. cultures and values. MIHP also provides international students with an informal atmosphere in which they can ask questions about U.S. customs, culture, and society. By acknowledging that international students are a welcome part of the Texas A&M community, MIHP deepens the relationship between international students and the Texas A&M community. MIHP also increases international students' knowledge of U.S. social institutions, promotes a better understanding of issues facing the international community, and provides international students a reference for casual U.S. dining. In exchange, the international students also have a chance to discuss their own cultures and social customs and bring the international experience home to their host families. Most importantly, MIHP lowers cultural barriers.

These invaluable educational experiences prepare our domestic students for jobs with multinational companies and the ability to perform under a wide variety of environments and with a diverse workforce and potentially diverse clientele. With a welcoming and nurturing global campus, the international student population, in turn, learns the merits and perspectives of the U.S. educational system and allows Texas A&M to cultivate relationships with individuals who become influential leaders back in their home countries. The current president of Panama is a former student of Texas A&M. As a result of Panamanian President Martin Torrijos Espino's experiences at Texas A&M, he has promoted formal student and faculty exchanges with Texas A&M as a mechanism to help increase the competitiveness of Panamanian universities.

Many areas of national need, for example the STEM fields of Science, Technology, Engineering and Mathematics, have a shortage of students. While it is imperative that we increase the number of U.S. students pursuing training in these areas, international students also provide a resource that can help drive the university's research agenda and provide trained graduates to meet the needs of U.S. employers. It is important to recognize that in addition to providing needed expertise to employers, international students often become entrepreneurs that add to the vitality of the U.S. economy and provide employment for many U.S. citizens.

Scientific discoveries are coming from all over the globe. In addition, many scientific challenges, such as effective alternative energy supplies and new breakthroughs in the life sciences require multidisciplinary teams. In many cases, these efforts are most effective if the collaborations involve global partnerships. These partnerships can also leverage the resources of a Texas A&M faculty member as the global partner brings resources to the collaboration. The benefits of these partnerships will be both scientific and economic.

Oversight of the relationships that are established is an important aspect of any multi-institutional partnership. When educational experiences of our students are involved, these mechanisms require additional effort. Each MOA that is signed must go through a rigorous review process that ensures multiple institutional officials review the agreement. At Texas A&M this is monitored at the highest levels. In the case of our branch campuses, we maintain on-sight staff that is charged with the oversight of the student experiences. In the case of the Qatar campus, we maintain a full academic administrative structure to ensure that the experiences students receive replicate the ones that they would receive if they were on the main campus.

Existing research and science education programs

As was mentioned earlier, we maintain a large number of international relationships that span a wide variety of disciplines and levels of engagement, from person-to-person relationships to major institutional commitments to international consortia. A long-standing example of our effective partnerships is the bilateral agreement we have with Mexico's National Council of Science and Technology (CONACYT). Through this partnership formally established in 2001, Texas A&M and CONACYT have invested over $2.2 million in collaborative research teams involving investigators from both Texas A&M and Mexico. The 93 projects funded so far through this program have established new collaborations, provided support for numerous students (from both Mexico and Texas A&M) and provided the seed funding needed to initiate collaborations that could not have been established without this support. The topics of the research are quite varied and of major interest to both Mexico and the United States, from Cross-Border Land and Water-Use Changes to Diabetes and Cardiovascular Disease among Mexicans and Mexican Americans to Electric Energy by Alternative Renewable Resources. Another example of the benefits of this program is the team of researchers who are working a multiyear bovine tuberculosis project. This funding not only allowed the research team from Texas A&M and from Mexico to look for a solution to a serious health problem that affects both animal and human populations along the U.S.-Mexico border, but also enabled graduate students to work along side the counterpart investigators in a meaningful way. As can be seen, this partnership is leading to not only scientific advances, but the potential for the outcomes to provide stimulus to the economic development of the Texas-Mexico border.

Our campus in Education City in Doha, Qatar provides us with a remarkable opportunity to help provide an increased capacity to develop an engineering workforce in the Middle East while simultaneously providing research opportunities to work on problems of interest to Texas, as well. An important aspect of the efforts in Education City is that this is a coeducational environment that promotes men and women learning and working in the same environment. During this past year, faculty at Texas A&M-Qatar received grants from the Qatar National Research Foundation (QNRF) for approximately $12 million to pursue research in topics in engineering, the physical sciences, and mathematics. In addition, our engagement in Education City has led to separate research opportunities for our Colleges of Education and Human Development and Liberal Arts.

The College of Education and Human Development was invited to collaborate with the University of Qatar to set standards for their teacher training programs. Qatari graduates from this joint program will be competent, motivated teachers prepared to train students to achieve at the highest international standards.

In addition to traditional international research partnerships, Texas A&M is also involved with three examples of novel cooperative relationships. Texas A&M University, the George Bush School of Government and Public Service, the George Bush Presidential Library Foundation, and the Chinese People's Association for Friendship with Foreign Countries have hosted three China-U.S. Relations Conferences that have helped expand academic and business opportunities and strengthen one of the most important global relationships. As has been noted by President George H. W. Bush, China is our most important bilateral relationship. Through this conference, Texas A&M is helping to promote continued dialogue, at all levels, and encourage the

development of strong partnerships in areas of joint interest. On the scientific side, this biennial conference series brings together scientists from the United States, primarily Texas A&M and China, to identify ways to work on problems facing both countries. A recent example of a successful collaboration is the project comparing the Yangtze and Mississippi River basins related to global climate variability and coastal ecosystem change.

Additionally, Texas A&M has received a significant grant from the U.S. Department of Defense (DOD) to help strengthen the ability of future military officers in language and cultural competency. The grant, part of the 2008 Reserve Officer Training Corps (ROTC) Language and Culture Project, is sponsored by the National Security Education Program, on behalf of the Defense Language Office, and will be used to create on-campus as well as overseas programs to enable students in the Corps of Cadets to gain greater exposure to the Chinese and Arabic-speaking worlds, as well as to create courses and other programs to improve language skills.

A second novel partnership is our new Institute for Applied Mathematics and Computational Science (IAMCS), which is a partnership with the King Abdullah University of Science and Technology (KAUST) in Saudi Arabia. Through this $20 million effort funded by KAUST, faculty at Texas A&M and its partner institutions will be working on problems that are of global importance while simultaneously, like Qatar, helping to establish a new higher education institution built on the western educational model. IAMCS is part of a global research alliance that includes only three other centers at Cornell University, Stanford University, and Oxford University. The research resulting from IAMCS will be open to peer review and published in the highest quality journals. We will develop new results that both advance the disciplines within mathematical and computational sciences, but also work on recurring annual themes, such as earth science and material science to help solve problems that will impact multinational audiences.

Finally, Norman E. Borlaug winner of the 1970 Nobel Peace Prize, the 1977 Presidential Medal of Freedom, and the 2006 Congressional Gold Medal is a Distinguished Professor in International Agriculture at Texas A&M. As the largest center for agriculture and life sciences in the world, Texas A&M Agriculture is--by virtue of mission and vision--uniquely poised for a new era of global leadership. Texas A&M's Borlaug Institute is assisting other nations to combat world hunger through technical innovation, training of agricultural scientists and workers, and intellectual leadership.

Current projects related to Iraq and Afghanistan include a $4 million USAID project for range management in Afghanistan, the $6 million USDA IAER program to improve agricultural extension in Iraq, and a $10 million USAID subcontract on the Inma Agribusiness program to build agribusiness in Iraq. The Institute's work began in Iraq in 2003 with crop technology demonstrations and extension support under the USAID Agricultural Reconstruction and Development for Iraq (ARDI) project based in Baghdad and Erbil. The Institute has had long-term agricultural specialists in Iraq from 2003 until the present.

Resulting from previous and current experience in Iraq, Texas A&M personnel are acquainted with Iraqi universities, government agencies, industries, businesses, infrastructure, leaders, natural resources and agricultural production technologies. There are currently 15 Texas A&M

personnel serving throughout Iraq working in cooperation with USAID, USDA, and DOD. We are engaged in private sector economic development, collaboration with educational institutions, and providing science-based solutions for the rehabilitation of the Iraqi agricultural sector.

Federal interaction and support

While the visa process is the most obvious example of interaction between Texas A&M and the federal government, we also actively engage federal sponsors and the peer reviewed mechanism to obtain funding to support our initiatives. In many cases, these funds are then leveraged by private or international sources. In the case of the China-U.S. Relations Conferences, we have actively involved cabinet level officials or their representatives to provide keynote addresses.

In looking at the broad perspective of global collaboration, one way the federal government can provide unique support is through the development of new programs that effectively provide funding for international collaboration. At this time, collaborations can be initiated through a variety of mechanisms, such as our partnership with CONACYT, but long-term funding for the most promising collaborations is extremely difficult to obtain. In most cases, such success involves each collaborator searching for funding independently in their home countries and hoping that both can find funds during the same funding cycle. Given the current rigorous competition for existing research funding, it appears that new resources would be required for such a program so that existing high priority initiatives are not impacted.

If resources can be made available, we feel that the funds should be committed for the long-term so that investigators can make the commitment required to make important advances in these new programs and so that our international collaborators know that they can depend upon our participation as they develop and commit their share of such a funding model.

It would seem natural that prioritization of research programs would be necessary to ensure sufficient resources to make an impact. A broad dialogue will be important in determining what these priorities are and ensuring that both scientific preeminence and economic impact will have a role in determining the topics that are chosen. It is important, however, that the scientific peer review process drive the allocation of the resources once the priorities are established to ensure credibility within the scientific community and the best possible science.

I thank the Committee for the important work they do for U.S. scientific research, and specifically, their interest in this important topic.