

Statement of
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for the Committee on Finance Hearing
“Foreign Threats to Taxpayer – Funded Research:
Oversight Opportunities and Policy Solutions”
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Sen. Grassley and members of the committee, thank you for the opportunity to present my views on aspects of foreign threats to taxpayer-funded research. I am the Gordon Moore Chair of Biomedical Engineering and Associate Director for Biophysical Oncology in the Knight Cancer Institute at Oregon Health & Science University. My formal training is in engineering and physics, but I have spent my research career of more than 40 years in biomedical research, developing and deploying advanced measurement technologies to elucidate the mechanisms that are important in the development and treatment of cancer and other diseases.

I have participated in aspects of several large-scale international research programs such as the Human Genome Sequencing Project, the NIH Cancer Genome Atlas project, NCI Cancer Systems Biology projects and the NCI Cancer Moonshot program. All of these projects have benefited from the work of foreign nationals and from robust international data exchange. During the course of my career, I have published nearly 500 papers, and I am a co-inventor on 80 U.S. patents. Importantly, foreign nationals made key contributions to many of these. In fact, scientists from Finland, Canada, Japan, and Russia were co-inventors on some the most important including several that were successfully commercialized by U.S. companies.

I began my career at the Lawrence Livermore National Laboratory where I held a top-secret security clearance. I then moved to faculty and research positions at the University of California San Francisco, the Lawrence Berkeley National Laboratory and now Oregon Health & Science University.

As a consequence of my employment at the Lawrence Livermore National Laboratory, I am well aware of the need to protect information that is of strategic importance to the United States. I am also aware of the constraints that the strict control of information imposes on scientific exchange, innovation and translation to improved patient outcomes. During my time at Livermore, the entry and movement of foreign nationals within the laboratory was strictly controlled as were my trips to meetings in foreign countries. The administrative and financial cost of these monitoring efforts was substantial.

I certainly consider my time at Livermore to have been scientifically productive. Indeed, several of my most significant inventions that have been successfully commercialized by U.S. companies were initiated at Livermore. So, innovation can and does occur in controlled environments.

However, the full development and exploitation of these inventions required national and international interactions that would have been difficult in the constrained Livermore

environment. It was also clear that the cost in money, time and efficiency of doing research in this controlled environment was extraordinarily high. In fact, my move from Livermore to the University of California San Francisco was motivated in part by my desire to achieve relief from these controls.

I am a strong proponent of the idea put forth by Steven Johnson in his book, "Where Good Ideas Come From", that innovation results from the integration of ideas and facts that arise through planned and unplanned interactions with other individuals. I also support his contention that the level of innovation increases with the number and diversity of those interactions. We run the risk of stifling innovation whenever we constrain interactions. Sometimes that is necessary but it should be kept to an absolute minimum.

It has been my experience that the way people approach problems is colored strongly by their past experiences and by the nature of their education. It is also my experience that individuals educated in other countries bring different ways of thinking and different facts. Further, these individuals undergo extensive vetting to ensure a high level of education and potential. Thus, I believe that innovative solutions to the complex problems we are trying to solve throughout the biomedical community today will occur most rapidly through the free and open exchange of information and ideas, including with a broad range of foreign nationals.

I believe that scientific innovation is one of the cornerstones of economic growth in the United States. I also believe that regulatory constraints that interfere with the free exchange of information and ideas will substantially decrease our level of innovation and therefore our economic and scientific competitiveness.

Scientists in the United States today face many challenges. These include uncertain funding, burdensome requirements for reporting, increasing workplace regulations and keeping up with the daunting flow of new ideas and data that are being generated worldwide. We are still successfully dealing with these challenges but just barely. Should additional requirements be put in place that regulate interactions with foreign nationals, the natural tendency of many scientists will be to avoid the interactions. I believe that this will significantly diminish innovation within the United States.

It is also important to know that many remarkable measurement tools now being developed around the world are providing an unprecedented amount of rich information about normal and diseased tissues, information that can be mined to yield new insights into disease prevention, detection and treatment. It is impossible to anticipate at this point how these data might be most effectively interpreted. It is equally impossible to anticipate how these data might be misused. The controls on data sharing that are now in place do protect against most forms of data misuse and I believe that efforts to further control access to these data will not have a measurable impact on data misuse but will have a significant negative impact on innovation.

In sum, I believe that the economic strength of the United States depends on innovation and on the speedy implementation and commercialization of innovative ideas. I believe that the controls that are already in place provide a workable balance between protecting data and intellectual property and allowing the free exchange of data and information needed for effective innovation. I believe that additional efforts to control interactions with foreign nationals will decrease innovation and, in so doing, will diminish the economic power of the United States and will have little impact on foreign misappropriation and misuse of information and ideas. Most innovative ideas and data will in any case eventually become available through the published literature and in published patents and so will be available for misuse. Instead of imposing constraints on innovation, which would be very expensive to implement, I advocate for adding supports to make it easier to protect the intellectual property that is generated with taxpayer dollars. I also recommend supporting the rapid and efficient transfer of information from academia to the private sector as well as between researchers worldwide so that maximum benefit can occur from the massive new technological advances and the big data being generated.

There are many barriers now in place to the kinds of technology transfer that will enable us to rapidly exploit academic innovations. I believe that our efforts would be best spent in reducing these barriers. This includes providing support for intellectual property development and substantially increasing support for early-phase business developments. In the end, economic success will come from rapid innovation and development, and aggressive protection of intellectual property using existing legal and political tools. The misappropriation of data and ideas is serious but should be dealt with through already existing legal and political means and not by placing constraints on the free information and idea exchange on which the U.S. competitive advantage depends.

I believe the best and most intelligent scientists in the world come to the US to study and work because of our free and open system. Additional constraints will not effectively deter nefarious activities but will diminish innovation and US economic growth. It is very important to not let the transgressions of a few inhibit the successes of the many.