Council of Graduate Schools Testimony for the Record
Driving Innovation through Federal Investments
Senate Appropriations Full Committee Hearing
April 29, 2014

Chairwoman Mikulski and Vice Chairman Shelby, the Council of Graduate Schools (CGS) appreciates having the opportunity to submit testimony for the hearing on Driving Innovation through Federal Investments. The Council of Graduate Schools is dedicated to the advancement of graduate education and research. Its membership includes over 500 universities that annually award more than 92 percent of all U.S. doctorates and over 78 percent of all master's degrees. Every day in the labs, libraries and classrooms in our institutions of higher education, faculty and students conduct leading-edge research, create and share knowledge and teach the next generation of scholars and professionals.

CGS joins other organizations and institutions of higher education in their concerns about the growing gap between the current level of federal funding for research and higher education and the investment that is needed if the U.S. is to remain competitive in a global economy where other nations such as China and South Korea are substantially increasing their investments. Our investment in research and innovation capabilities has stagnated and is not keeping up with inflation. Sequestration took a large bite out of discretionary funding, which had a serious impact on the federal agencies to which universities turn for research grants. As the number of federal research grants decreases, so does the support for graduate students who work on these research grants. The budget agreement reached in December provided temporary relief from sequestration cuts until 2016, when even deeper cuts will have to be made. Just as the budget deficit cannot be ignored, neither can the innovation deficit.

Federal investment in research and development at American universities has produced significant innovations, inventions and breakthroughs that have saved lives, spurred new product development and commercialization, and created jobs. It has also provided the opportunity for graduate students, working in university laboratories alongside research faculty, to gain the skills they need to be the next generation of scientists, innovators and entrepreneurs.

Graduate students drive the research and innovation at our universities. Their research in science, medicine, health, education and the arts and humanities contributes directly to the groundbreaking discoveries, inventions and innovation which results in sustained economic growth and prosperity. They are the researchers, entrepreneurs and inventors of the future. Graduate students not only engage in groundbreaking research, they facilitate technology transfer, participate in the development of new products and services that stimulate partnerships between universities and industry, and contribute to methodologies and approaches to complex social problems. At the University of

Alabama, for example, graduate students have developed new “green” materials to produce fibers for use in high value medical products, and have created software that immediately shows the location of automobile crashes on highways so that law enforcement and medical assistance can respond more quickly. The creators of Google, Sergey Brin and Larry Page, began the site as a graduate research project in computer science at Stanford University. While in graduate school, completing his doctorate in chemistry from Duke University, Dr. Carmichael Roberts developed molecules used to determine mechanisms and cures for a variety of diseases.

There are also many examples of the contributions graduate degree holders have made. Here are just a few. Dr. Andrew Grove, a Ph.D. in chemistry from the University of California, Berkeley, co-founded Intel Corporation a mere five years after receiving his degree. Holding a Ph.D. in educational administration and industrial relations from Loyola University in Chicago, Dr. Stephanie Pace Marshall founded the Illinois Mathematics and Science Academy and pioneered innovative approaches to science and math education. Mr. Bret Lanz, who received his master’s of business administration from Kansas State University, was responsible for the commercial success of a decontamination agent for biological and industrial hazards. Dr. Moira Gunn, received her Ph.D. in mechanical engineering from Purdue University, worked for NASA, holds a technical patent in human nutrition, and hosts NPR’s Tech Nation, the only national weekly radio program on the impact of science and technology on everyday life. Dr. Mansur Hasib, who earned a Doctor of Science in Information Assurance from Capitol College in Laurel, Maryland, has authored a book in which he explains what an organization needs to know to implement cybersecurity governance.

Graduate degree holders have been instrumental in establishing new start-up companies that create jobs, promoting public health initiatives, creating community reconciliation and reconstruction mechanisms within countries experiencing conflict, and preparing the K-12 teacher workforce. The contributions of graduate students and graduate degree holders are essential to America’s global economic leadership.

These examples illustrate why support for graduate education, its faculty and students, is critical if we are to grow our domestic scientific talent and have the skilled workforce we need to be competitive in a global economy. The decline in Federal investments, exacerbated by sequestration, must not continue. According to the Bureau of Labor Statistics, occupations that require a master’s degree are expected to grow by 18.4 percent between 2012 and 2022, and in the same timeframe, those occupations requiring a doctoral or professional degree will grow by 16 percent. Federal investment in research assistantships, fellowships and traineeships has not kept pace with the growing demand for skilled workers, particularly in the STEM fields.

To meet this growing demand, CGS encourages the committee to increase its investment in graduate education through research assistantships and traineeships that contribute to a world-class, broadly inclusive and globally engaged science and engineering workforce. As effective as graduate education has been in driving the research and innovation engines of the United States, we know that there are areas of

strategic investment that will increase its impact even further. STEM graduate programs would benefit from an enhanced capacity to provide professional skill development to all students appointed to grants as research assistants. Professional skill development will prepare graduate research assistants for a range of careers in academic, business, government and non-profit sectors.

Additionally, traineeships have become recognized as an extraordinarily effective model for funding the education of the STEM doctoral workforce, but only constitute a small fraction of current support for doctoral students. CGS suggests increased funding for a doctoral traineeship program that prepares doctoral students for their chosen career by providing appropriate financial support, innovative degree programs in areas of national need, professional development opportunities, career counseling services and meaningful engagement with employers. These traineeships combine disciplinary content with professional skill development that is relevant and applicable to a diversity of career pathways and provide the skills needed to become successful innovators. Traineeship programs are institution-wide efforts that promote collaboration within and across departments. By emphasizing mentoring and academic advisement, professional skill development, and interaction with employers, traineeship programs prepare graduate students to successfully meet the increasing skill demands of a knowledge economy.

America must continue its leadership role in research, scientific exploration and discovery and innovation and invention. This cannot be done without continued and enhanced Federal investment in graduate education, particularly through the support for traineeships and other professional skill development opportunities.

Again, thank you for the opportunity to submit testimony for the record on this important issue.