

Testimony of Dr. Jerome D. Odom
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Subcommittee on Science and Space
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Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to testify today regarding the National Science Foundation's Experimental Program to Stimulate Competitive Research Program (EPSCoR) and efforts to enhance our nation's competitiveness.

I am Jerome Odom and I am Executive Director of the University of South Carolina Foundations. I have previously served as Chair of the University of South Carolina Department of Chemistry and Biochemistry, as Dean of the College of Science and Mathematics, and as Executive Vice President for Academic Affairs and Provost of the University of South Carolina. I also am Chair of the EPSCoR/IDeA Foundation, a non-profit organization that promotes research and technology activities in the 25 states and two territories that are served by the National Science Foundation's EPSCoR program.

I mention my background because I have had the opportunity to view the significant impact of the NSF EPSCoR program from several career vantage points in South Carolina and, in my role as EPSCoR/IDeA Foundation Chair, have been able to confirm that my positive views of the program are shared by my colleagues throughout the community of EPSCoR states. I also mention my background because it has enabled me, over the years, to examine and participate in university and statewide research infrastructure development from several different viewpoints.

I want to thank this Subcommittee as well as the Committee as a whole for its continuing and solid support for the National Science Foundation and for the EPSCoR program. We have found your interest and assistance over the years both gratifying and invaluable in growing and strengthening our programs. I would also like to thank Dr. John Marburger III, the President's Science Advisor, for his support and for the meetings that he convened at OSTP on our behalf. And finally, I would like to thank the NSF for its new approach to the EPSCoR budget. For many years, Congress would increase the EPSCoR budget in the appropriations process, only to see it reduced in the following year's budget. This practice has been abandoned and we appreciate it.

I am here today to endorse the American Competitiveness Initiative, the doubling of the NSF budget and efforts to ensure that our nation's research base continues to lead scientific and technological development. I share the concerns of those who believe that we must make new investments in basic research, in the physical sciences and engineering in particular if we are to mine the promises of 21st century science. We are at a threshold of scientific potential unknown to previous generations – and we are also at a threshold of changes in the research community wrought by a globalization of science, demographic changes in the universe from which we draw our talent, new competition for foreign students, an aging and almost certainly soon to retire academic and scientific professorate, and a workplace that draws Master's and PhD students who might once have remained in an academic research environment.

I am also here today to argue strenuously that in the surge to respond to competitiveness and innovation needs, that the contributions and potential of 25 states – half the states – and two other jurisdictions – cannot be ignored. Instead, this community of EPSCoR/IDeA states can and must play a prominent role in our knowledge driven research community, society and economy. I submit that the EPSCoR states have recognized areas of research excellence, students well positioned to pursue careers in science and engineering, increasing clusters of high tech and small businesses – often centered around our universities, faculty recruited nationally and mounting success at securing NSF, NIH and awards from other funding agencies.

The EPSCoR states graduate about 20 percent of our scientists and engineers annually. Several of our institutions have fine records in winning Goldwater Fellowships, NSF Graduate Fellowships and other prestigious research based fellowships. A number of our institutions ranked in the first tier of the recently announced Carnegie classifications. The current director of the National Science Foundation is, in part, a product of an EPSCoR state – although he probably would not recognize it today. And EPSCoR states have helped produce a number of other NSF directors and deputy directors as well as other leaders in the research community.

Unfortunately, we still need help in rising above the 10 percent of federal R&D funding that the 27 EPSCoR jurisdictions currently receive from NSF – and most other federal departments and agencies. These 25 states still need help in building our research infrastructure, broadening our representation on panels and advisory boards, enhancing our high speed computing and networking capabilities and pursuing new opportunities.

I should point out that we are exceedingly pleased that the NSF has asked the EPSCoR community to organize a workshop to develop a new vision for the EPSCoR program. I have been working with Dr. Kathie Olsen, the Deputy Director of NSF, and Dr. Nathaniel Pitts, the Director, Office of Integrative Activities, to organize this workshop and we anticipate recommendations consistent with the American Competitiveness Initiative, the National Science Board's 2020 Vision and other recent reports. Half the states should not be missing from these initiatives.

For the record, let me provide some background on the EPSCoR program and the states that participate. This is one successful federal program which has addressed the past and current research funding disparity. This program was first established at the National Science Foundation in 1980 to assist in the development of a competitive research infrastructure in those states with a less intensive academic research capability and in response to Congressional concerns over the geographical imbalance in the allocation of funds for academic research and development (R&D).

The National Science Foundation plays a pivotal role in academic research in our nation. The benefits of scientific research are central to improving our lives, and the lives of future American generations in areas related to energy, health, economic security, and national defense. Unfortunately, however, not all states benefit fully from NSF -- and other federal -- research funding, which is relatively uneven. In FY 2005, for example, the 27 EPSCoR jurisdictions (25 states and 2 territories) received only about 10 percent of all NSF research funding, even though

the EPSCoR states have about one-fifth of the U.S. population and about the same shares of both doctoral universities and scientists who are engaged in research. By contrast, five states received 43 percent of all NSF R&D funding. As previously mentioned, NSF is not alone. Other research funding departments and agencies of the federal government have similar distributions.

Every state needs to benefit from federal support that creates a scientific research infrastructure that can respond to the special needs of that state. Every state should profit from the educational, economic and technological benefits that come from having a strong research presence. Every state's students – most of whom will attend college within 100 miles of home – deserve an opportunity participate in scientific research activities, and every state's research universities can contribute their own unique scientific expertise to our Nation's science and technology priorities through research. The benefits of a strong academic research infrastructure must be more widely dispersed than they are today. There are indeed two sides to the benefit coin -- the states deserve the opportunities which a strong research base provides and the nation, I would submit, requires the participation of these states if it is to meet the challenges to research and talent production described in the 2006 Science and Engineering Indicators.

NSF EPSCoR operates under the premise that, by building academic science research infrastructure, EPSCoR states' universities will develop a competitive research base with the people, equipment and focus to become competitive for NSF and other federal R&D funding. The centerpiece of NSF EPSCoR is the Research Infrastructure Improvement (RII) awards, which are granted only after an intensive "merit review" by nationally competitive scientists and administrators. NSF EPSCoR also uses a "co-funding" mechanism under which funds appropriated to the EPSCoR program are utilized to match funds from the research directorate programs in order to fund proposals (including SBIR proposals) that were meritorious but might not be otherwise funded. Finally, NSF EPSCoR provides technical assistance and outreach efforts.

The "centerpiece" support mechanism of the NSF EPSCoR effort is the Research Infrastructure Improvement (RII) awards, which have been highly successful. The reason most of the EPSCoR states are less competitive than they should be for NSF and other funding is that they do not have the research infrastructure – the facilities, the equipment, the number of researchers needed for competitive clusters or all the relevant expertise required for a cluster, the start-up packages for new hires, the time releases to pursue grants and collaborations that the more developed institutions have. Creating that infrastructure takes time and resources. The RII awards are a proven mechanism for advancing research infrastructure development. I would suggest that EPSCoR states, like the more developed states, need a minimum of 10 years of individual RII support to build up the targeted science research areas. This time period is also used by NSF's Engineering Research Centers to develop focused areas. If given sustained support over time, remarkable results can be achieved.

I would like to provide some examples of how NSF EPSCoR support has made a fundamental difference in the quality of academic research in South Carolina, and how this scientific research will impact the state's citizens:

South Carolina's strategy to develop its intellectual resources has been to provide support for new junior faculty who bring with them access to specific technologies not represented within our targeted areas of S&T excellence and achievement: materials/nanoscience; biomaterials, engineering and technology; structural, chemical and cellular biology; and neuroscience and imaging. The following highlights illustrate the ongoing success of this statewide strategy. At the University of South Carolina, NSF EPSCoR program resources were used in the late 1980's for the hire of Dr. Michael Myrick and several other young faculty having expertise in new materials. Dr. Myrick has achieved full professor and is the innovative force behind Ometric, a 2005 high-tech USC spin-off concentrating on the pharmaceutical, chemical and oil industries. Ometric is engaged with the world's top ten pharmaceutical companies, including Roche in Switzerland to enable inline control of chemical processes for pharmaceutical production. The company has recently attracted venture capital investments in excess of \$8.5 million.

Dr. Karen Burg, a hire in bioengineering at Clemson University who received an NSF PECASE Award (2002), was named to MIT Technology Review's 100 Young Innovators List for 2003 and was also granted tenure and promoted to the rank of Associate Professor two years early. At the Medical University of South Carolina, 5 new tenure-track faculty members have recently been hired into the Department of Physiology and Neuroscience, including one minority member. Extramural research funding in the department has grown over ten-fold. This growth has resulted in establishing internationally-recognized research teams with expertise in cellular mechanisms of visual and auditory systems.

Mr. Chairman, I am happy to report that are many more of these examples in South Carolina and the other states. In fact we report these successes to NSF each year.

The President's Budget for FY 2007 calls for significant increases in the overall NSF research budget. The EPSCoR states fully support this increase. We also hope that this Committee will direct NSF to make sure that all states are given the opportunity to participate in agency programs as the budget increases. For example, in the area of cyber infrastructure, NSF is clearly positioned to play a lead role in advancing cyber research issues that will ultimately impact our nation's wealth creation process. If only a few large universities in a small number of states are allowed to meaningfully participate in new cyber infrastructure programs, the nation as a whole will lose. Similarly, benefits from basic research in areas that ultimately have an impact on energy or homeland security should accrue to all regions and states.

As I mentioned previously, NSF has invited the EPSCoR community to provide a bottoms up recommendations to the NSF Director on what the NSF EPSCoR program should look like over the next 10 to 15 years. The EPSCoR states greatly appreciate this invitation and have submitted plans for a June 2006 Workshop on this topic. The willingness of NSF to engage its science and engineering client communities in planning strategic processes should be commended. We will provide a report to NSF on the Workshop outcomes, with copies to the Committee.

I want to thank you for the opportunity to address the Subcommittee today. Thank you.