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**Position Statement on the FY 2014 Budget Request for the  
National Institutes of Health (NIH) submitted by the  
ASME Technical Communities Bioengineering Division to the  
Appropriations Subcommittee on Labor, Health and Human Services,  
Education and Related Agencies**

**August 20, 2013**

The NIH Task Force (“Task Force”) of the Bioengineering Division of Technical Communities of the ASME Knowledge and Community Sector is pleased to provide comments on the bioengineering-related programs contained within the National Institutes of Health (NIH) Fiscal Year (FY) 2014 budget request. The Task Force is focused on the application of mechanical engineering knowledge, skills, and principles for the conception, design, development, analysis and operation of biomechanical systems.

**The Importance of Bioengineering**

Bioengineering is an interdisciplinary field that applies physical, chemical, and mathematical sciences, and engineering principles to the study of biology, medicine, behavior, and health. It advances knowledge from the molecular to the organ levels, and develops new and novel biologically derived medications and devices, materials processes, implants, and informatics approaches for the prevention, diagnosis, and treatment of disease, for patient rehabilitation, and for improving health. Bioengineers have employed mechanical engineering principles in the development of many life-saving and life-improving technologies, such as the artificial heart, prosthetic joints, diagnostics, and numerous rehabilitation technologies.

**Background**

The NIH is the world's largest organization dedicated to improving health through medical science. During the last 50 years, NIH has played a leading role in the major breakthroughs that have increased average life expectancy by 15 to 20 years.

The NIH is comprised of different Institutes and Centers that support a wide spectrum of research activities including basic research, disease and treatment-related studies, and epidemiological analyses. The mission of individual Institutes and Centers varies from either study of a particular organ (e.g. heart, kidney, eye), a given disease (e.g. cancer, infectious diseases, mental illness), a stage of life (e.g. childhood, old age), or finally it may encompass crosscutting needs (e.g., sequencing of the human genome). The National Institute of Biomedical Imaging and Bioengineering (NIBIB) focuses on the development, application, and acceleration of biomedical technologies to improve outcomes for a broad range of health care challenges.

**FY 2014 NIH Budget Request**

The total FY 2014 NIH budget request is \$31.3 billion, a 1.5 percent increase over FY 2012 enacted amounts. The Task Force recognizes that this proposed budget is still significant given

the Administration's commitment to reducing the federal deficit. However, the Task Force notes that the Administration's relatively flat budget requests for the NIH is all the more difficult for the medical research community to absorb due to the 2.1 percent annual projected increase in medical research costs due to inflation – as predicted by the Biomedical Research and Development Price Index (BRDPI). This inflationary pressure is compounded by the stagnant budgets for the NIH over the last few years, resulting in a significant decrease in funding for the NIH over the past few fiscal years.

NIH is enacting policies to guide investments while limiting the impact of these inflationary cost increases, including a one percent increase in the average cost of competing and non-competing Research Project Grants (RPGs); a one percent increase in Research Centers and Other Research; and a one percent increase for Intramural Research and Research Management and Support; and constraints on staffing levels. However, these policies alone are not sufficient to offset the need for additional support for critical areas of health research, especially given the reduction in funding and the high inflation rate of medical research costs over the last several years. We therefore fully support the President's proposed FY 2014 budget as a minimum level for the NIH given current budget constraints, but recommend out-year budget increases well beyond BRDPI inflation rates to compensate for the erosion of medical research funding the agency has experienced over the last few years.

The Administration estimates 10,269 competitive Research Project Grants (RPG) will be supported under the FY14 budget for NIH-wide RPGs. The Task Force commends the Administration for again focusing on funding new RPGs in FY14, resulting in an increase of 1,283 supported grants over the FY 2012 level of competing RPGs.

### **NIBIB Research Funding**

The Administration's FY 2014 budget request supports \$338.9 million for the NIBIB, an increase of \$1.0 million or 0.3 percent from the FY12 enacted amount. The mission of the NIBIB is to seek to improve human health by leading the development and application of emerging and breakthrough technologies based on a merging of the biological, physical, and engineering sciences. As noted above, this funding decrease is compounded by the 2.1 percent projected increase in research costs due to inflation predicted by the BRDPI index for FY 2014.

The budget for NIBIB Research Grants would decrease slightly from \$227.7 million to \$226.2 million, a 0.65 percent decrease. Funding for intramural research would be held flat at \$11.4 million. NIBIB's Research Management and Support request is \$19.78 million, the same as the FY 2012 amount.

NIBIB funds the Applied Science and Technology (AST) program, which supports the development and application of innovative technologies, methods, products, and devices for research and clinical use that transform the practice of medicine. The FY 2014 request for AST is \$168.2 million, a 0.9 percent increase from FY12.

Additionally, NIBIB funds the Discover Science and Technology (DST) program, which is focused on the discovery of innovative biomedical engineering and imaging principles for the

benefit of public health. The FY14 request for DST is \$86.9 million, a 0.1 percent decrease from FY12.

The Technological Competitiveness-Bridging the Sciences program, which funds interdisciplinary approaches to research, would receive \$20.3 million in FY14, the same amount as in FY12.

### **Task Force Recommendations**

The Task Force is concerned that the United States faces rapidly growing challenges from our counterparts in the European Union and Asia with regards to bioengineering advancements. While total health-related US research and development investments have expanded significantly over the last decade, investment in bioengineering at NIBIB has remained relatively flat over the last several years.

The Task Force wishes to emphasize that, in many instances, bioengineering-based solutions to health care problems can result in improved health outcomes and reductions in health care costs. For example, coronary stent implantation procedures cost approximately twenty thousand dollars, compared to bypass graft surgery at double the cost. Stenting involves materials science (metals and polymers), mechanical design, computational mechanical modeling, imaging technologies, etc. that bioengineers work to develop. Not only is the procedure less costly, but the patient can return to normal function within a few days rather than the months often required to recover from bypass surgery, greatly reducing other costs to the economy. NIBIB research is also helping to commercialize new technologies, such as new low-cost ultrasound imaging systems, which became commercially available after just seven years in development. NIBIB-funded research and development also support health care decision support systems for physicians that provide the latest evidence-based practices, improve consistency of care, reduce patient risk, helping to deliver health care solutions more safely and effectively and decreasing overall costs by up to seventeen percent in pilot programs. Therefore, we strongly urge Congress to consider increased funding for bioengineering within the NIBIB and across NIH, and to work to strengthen these investments in the long run to reduce US health care costs and support continued US leadership in bioengineering.

Even during these challenging fiscal times, the NIBIB must obtain sustained funding increases, both to accelerate medical advancements as our nation's population ages, and to mirror the growth taking place in the bioengineering field. Data on NIH economic benefits indicate a three to five dollar return to the local economy for every one dollar invested in research. In addition, the NIH has an important feeder effect on small companies clustered around academic research institutions. NIBIB funding plays a unique role in this health care innovation system due to its continued focus on technological development and high-risk, high-reward research. The Task Force believes that the Administration's budget request for FY 2014 is not aligned with our long-term national health care challenges; a flat or reduced budget will not keep up with current inflationary increases for biomedical research, eroding the United States' ability to lay the groundwork for the medical advancements of tomorrow.

While the Task Force supports efforts to continue ramping up federal investments in research and development in the physical sciences, we believe that strong federal support for bioengineering and the life sciences is also essential to the health and competitiveness of the United States. Congress and the Administration should work to develop a specific plan, beyond President Obama's call for 'innovations in health care technology' to focus on specific and attainable medical and biomedical research priorities which will reduce the costs of health care and improve health care outcomes. Further, Congress and the Administration should include in this strategy new mechanisms for partnerships between NSF and the NIH to promote bioengineering research and education. The Task Force feels these initiatives are necessary to build capacity in the US bioengineering workforce and improve the competitiveness of the US bioengineering research community.

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