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**Position Statement on the FY 2016 Budget Request for the
National Institutes of Health (NIH) submitted by the
ASME NIH Task Force**

April 29, 2015

ASME is a non-profit technical and educational organization with over 140,000 members worldwide. The Society's members work in all sectors of the economy, including industry, academia, and government. The ASME NIH Task Force (“Task Force”) of the ASME Inter-Sector Committee on Federal Research and Development is pleased to provide comments on the bioengineering-related programs contained within the National Institutes of Health (NIH) Fiscal Year (FY) 2016 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. For the last five decades the 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 2016 NIH Budget Request

The total FY 2016 NIH budget request is \$31.3 billion, a 3.3 percent increase over FY 2015 enacted amounts. The Task Force recognizes the Administration’s commitment to reducing the

federal deficit but this increase barely outpaces the inflation rate. According to the Biomedical Research and Development Price Index (BRDPI), the projected increase in medical research costs due to inflation is 2.4 percent. 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 six percent increase in the average cost of competing and non-competing Research Project Grants (RPGs); flat funding for 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 2016 budget as an absolute 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.

NIBIB estimates 626 competitive Research Project Grants (RPG) will be supported under the FY16 budget, an increase of 48 grants. The Task Force commends NIBIB's focus on increasing the number of new RPGs in FY16 because as this could significantly benefit future researchers in a program that has been considered tight for funding opportunities.

NIBIB Research Funding

The Administration's FY 2016 budget request supports \$337.3 million for the NIBIB, a three percent increase over the FY15 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 relatively flat funding is compounded by the 2.4 percent projected increase in research costs due to inflation predicted by the BRDPI index for FY 2016.

The budget for NIBIB Research Grants would increase slightly from \$212.4 million to \$226 million, a 6.4 percent increase. Funding for intramural research would be held flat at \$12 million. NIBIB's Research Management and Support request is \$19.7 million, a one percent increase from the FY 2015 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 2016 request for AST is \$158.6 million, a 4.3 percent increase from FY15.

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 FY16 request for DST is \$101.6 million, a 7.9 percent increase from FY15.

The Technological Competitiveness-Bridging the Sciences program, which funds interdisciplinary approaches to research, would receive \$22.4 million in FY16, also a one percent increase from FY15.

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 17% 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 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 2016 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. Finally, the federal research budget should provide long-term projections in order for researchers can plan accordingly. 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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