

CHARGE TO THE SMRB

BACKGROUND

America invests \$3 billion each year in science, technology, engineering, and mathematics education, yet students continue to lag behind many of their international counterparts in test scores and selection of science-related careers. The Nation will need to improve its approach to science education in order to prepare its citizens to be sophisticated consumers in a technologically advanced society and to produce a high-quality and globally competitive scientific workforce that meets future demand in the international science and technology marketplace.

In order for the National Institutes of Health (NIH) to fulfill its mission, there must be a sustained, skilled biomedical workforce. This necessitates a pipeline of students training for careers in the biomedical sciences. NIH plays a vital role in training scientists at the graduate and postgraduate level in order to ensure a robust and competitive scientific workforce, investing significantly in these activities. These investments influence the career trajectories of individuals as they advance through their education and training and enter the workforce. NIH also has a tradition of supporting activities earlier in the biomedical workforce pipeline, such as efforts to improve the quality of science education in American schools and engage pre-college students in the biomedical sciences. However, there is no overarching strategic plan for these activities, and the most effective role for NIH in this realm is more ambiguous. Defining how NIH should spark and cultivate sustained interest in biomedical science among students from pre-kindergarten through high school should contribute to a healthy biomedical workforce pipeline.

It is in the interest of NIH to identify pre-college opportunities where NIH efforts and resources could be applied successfully to draw children and young adults into scientific careers. To achieve this goal, NIH seeks advice from the SMRB regarding how to (1) define an evidence-based role for NIH in strengthening the pre-college biomedical workforce pipeline, (2) identify ways for NIH to improve the evidence base for pre-college engagement in science, and (3) prioritize the most effective uses of NIH's efforts and resources to attract young people to biomedical science careers. NIH recognizes the importance of scientific awareness and scientific literacy to cultivate an informed and discerning public. However, in keeping with NIH's mission¹ and its goal to "develop, maintain, and renew scientific human and physical resources that will ensure the Nation's capability to prevent disease," deliberations on pre-college engagement activities should focus on enhancing the biomedical workforce pipeline.

CHARGE

NIH charges the SMRB Working Group on Pre-college Engagement in Biomedical Science with recommending ways to optimize NIH's pre-college programs and initiatives that both align with the NIH mission and ensure a continued pipeline of biomedical science students and professionals. In addressing this charge, the SMRB should:

¹ The NIH mission statement can be viewed at <http://www.nih.gov/about/mission.htm>.

- Examine the evidence base for successful approaches for pre-college biomedical science programs aimed at strengthening the biomedical workforce pipeline;
- Identify the attributes, activities, and components of effective pre-college biomedical science programs, including the role and relative importance of teacher training programs;
- Identify those points in the pre-college biomedical workforce pipeline where NIH's efforts could be applied most effectively, given finite resources; and
- Define ways for NIH to improve the evidence base for effective pre-college biomedical science programs.

PROCESS

The Pre-college Engagement in Biomedical Science Working Group will:

- Study previous and current Federal pre-college education efforts, particularly in biomedical science;
- Review assessments of NIH pre-college science programs and their impact;
- Examine the evidence base for successful outcomes of engagement at various points along the pre-college biomedical workforce pipeline, including teacher training;
- Identify gaps, opportunities, and challenges related to NIH activities along the pre-college biomedical workforce pipeline;
- Seek input from experts and stakeholders such as NIH leadership; science educators; authorities on education policy and curriculum development; scientific, community, and advocacy organizations; other government organizations with science education programs; representatives from the biomedical workforce; and students;
- Hold deliberations in conjunction with the full SMRB; and
- Report recommendations to the full SMRB.

DELIVERABLES

The Pre-college Engagement in Biomedical Science Working Group will present to the full SMRB:

- A summary of the gaps, opportunities, and challenges for NIH in pre-college science programs;
- A summary of attributes and components of effective pre-college biomedical science programs;
- Recommendations for the points along the pre-college biomedical workforce pipeline where NIH efforts can be effectively applied;
- Advice on the steps and components necessary to augment the evidence base for determining best practices in pre-college science programs, as well as for monitoring and adjusting these activities as needed; and
- Prioritized recommendations for optimizing NIH's engagement in activities to strengthen the pre-college biomedical workforce pipeline.

The Pre-college Engagement in Biomedical Science Working Group will present its findings and recommendations to the full SMRB in a time frame that positions the full Board to complete its deliberations on this matter by December 2014.