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Research Perspectives

An Update from the AAMC's Chief Scientific Officer

The NIH Working Group on the Biomedical Research Workforce

Ann Bonham, Ph.D.
Chief Scientific Officer
AAMC

"If you think research is expensive, try disease."
— Mary Lasker

I write this shortly after the most welcome news that the U.S. Supreme Court has upheld the Patient Protection and Affordable Care Act, reassuring us that as formidable as the challenges to the US healthcare system may be, our nation has the political determination and legal authority to see that all Americans will soon be able to receive health insurance. The ruling also upheld other parts of the law that will preserve advancements in biomedical research - the establishment of the Cures Acceleration Network (CAN), a cornerstone of the National Center for Advancing Translational Sciences, and the establishment and funding for the Patient Centered Outcomes Research Institute (PCORI, referenced in my **newsletter** on April 3).

There was another event earlier in June, which will also help ensure that more Americans will live longer, healthier lives, and that they will do so in a nation that is more productive and prosperous. On June 14, the Working Group on the Biomedical Research Workforce delivered its draft report and recommendations to the NIH Director's Advisory Committee (ACD), the same day as the Working Group on Diversity in the Biomedical Research Workforce (the subject of my **newsletter** on June 20).
The draft report on the biomedical workforce is also welcomed as it addresses directly and resolutely that most essential component of a strong biomedical research infrastructure – the human capital base. Nothing is more central to ensuring the nation's health, competitiveness, and innovation than ensuring a diverse and sustainable biomedical workforce.

The Working Group's Charge and Major Recommendations

In order to respond to NIH's changing resource environment, and the many new discovery opportunities and health priorities faced by the agency, NIH Director Francis Collins last year appointed the Working Group to review comprehensively the agency's many training programs and mechanisms, including those for both graduate and post-doctoral scientists, to see if the optimal numbers of scientists are being trained and are being trained adequately to address foreseeable workforce needs.

The Working Group was charged to develop models for a sustainable and diverse workforce and, based on its analysis and input from the **extramural community**, to recommend ways NIH should revise its training or other programs. The group was co-chaired by Shirley Tilghman, Ph.D., President of Princeton University, who had led an earlier workforce analysis for NIH in the late 1990s, and Sally Rockey, Ph.D., NIH Deputy Director for

Extramural Research. Dr. Tilghman presented the **findings and recommendations** to the ACD on June 14. Highlights of the report are summarized below.

Data Collection, Analysis and Dissemination

A central finding of the Working Group was that NIH and the extramural community have insufficient data to understand important dimensions and trends in the biomedical science career pipeline; this includes insufficient data even on the precise number of post-doctoral trainees supported by NIH and other sources (the Working Group relied on estimates with high variability). Data are also lacking or poor in tracking outcomes for students who graduate from NIH-sponsored training, particularly for the majority of trainees who are now employed in sectors other than academic or NIH-sponsored biomedical research. Outcomes data are somewhat more comprehensive for graduates of formal NIH training programs (such as T32 programs) and fellowships, than for trainees supported on research project grants (again, the majority of trainees). This dominant support on NIH Research Project Grants (RPGs) also includes training for nearly all international graduate students, as they are ineligible for T32 or similar program support. Notably, the NIH Diversity Working Group raised the same issues around the lack of reliable data. The Workforce Working Group recommended:

- Institutions that receive NIH funding should collect data, such as time to degree, completion rates and other measures, on the career outcomes of all graduate students and postdoctoral researchers and provide this information to the NIH and to prospective students.
- NIH should assign graduate students and incoming postdoctoral researchers a single identifier to track them through their careers to help facilitate the determination of career outcomes.
- NIH should establish a permanent office within the Office of the Director, and in concert with other science agencies, to coordinate data collection and align workforce needs.

Graduate Students

Not surprisingly, the Working Group found that the size of the NIH budget itself is largely a driver of the overall number of PhD students in biomedical research, which has consequently doubled over the last two decades. While the number of trainees supported on training grants and fellowships have remained constant over this time, the number supported on RPGs has grown substantially. About one quarter of PhD graduates eventually enter tenure-track faculty positions, compared to more than one-third who entered tenure-track positions in the 1990s. Others enter industry, non-tenure track positions and other employment (although actual unemployment among these graduates remains gratifyingly low). Despite these changes, graduate training remains focused primarily on training students for academic research positions, modeled on their own faculty professors. Moreover, careers, whatever the outcome, take longer to obtain, with time to degree and other factors lengthening. The Working Group recommended:

- NIH should increase the proportion of graduate students supported by training grants and fellowships while limiting support to five years at one institution, six years total per individual.
- Peer review criteria for training grants should be revised and reviewers educated to value a broad spectrum of career outcomes when considering training program outcomes.
- Institutions should be encouraged to diversify a trainee's career development experiences to better prepare them for various career options within and outside of the academia. (I note with others that we should no longer refer to such valuable and germane outcomes as "alternative" careers).
- Training program and fellowship requirements should be harmonized across all NIH institutes and centers.

Postdoctoral Researchers

The Working Group found that the population of US trained postdoctoral trainees has grown commensurate with the number of graduate students. In addition, as noted above, there has been a huge increase in the numbers of international graduates working as postdoctoral fellows. The Working Group recommended:

- NIH should encourage more structured training and increase the proportion of postdoctoral researchers supported by training grants and fellowships while reducing the number supported by RO1s.
- The Ruth L. Kirschstein National Research Service Awards (NRSA) starting stipend should be increased to $42,000.
- NIH should modify policies to require individual development plans (IDPs) and to require institutions to provide employee level benefits to all NIH-supported postdoctoral researchers.
- NIH should increase the number of K99/R00 and NIH Director's Early Independence awards.

Staff Scientists

The Working Group noted that staff scientists constitute an essential part of the NIH intramural research program and supported increasing the ratio of staff scientists (individuals with masters or PhD degrees) in extramural research to help ensure the stability and productivity of the research enterprise. The Working Group encouraged NIH study sections to be receptive to grant applications that include staff scientists and urged institutions to create position categories that reflect the value and stature of these researchers.

Significantly, the Working Group also called for NIH "to consider" a long-term approach to reducing the percentage of funds that can be used for faculty support. The AAMC's own **analysis** has shown that of member medical school faculty who receive NIH grants, the mean percentage of salary support on grants is well under 50%.

Physician-Scientists

The Working Group recommended that NIH convene a separate group that would focus on physician-scientists training.

What AAMC is doing

The AAMC's Group on Graduate Research Education and Training (GREAT) has been a leading voice for reform on many of these issues, especially revising training programs to appropriately fit the growing variety of biomedical research careers (thanks to all of you who have worked to see that recommendation adopted). As part of its strategic planning process, the GREAT Group Steering Committee has a subgroup focused on improved data collection, which is looking for "bright spots" among member institutions that centrally collect useful data on training programs and career outcomes (for more information, contact Dr. Jodi Lubetsky at **jlubetsky@aamc.org**)

I encourage you to join us at the **2012 GREAT Group and GRAND Annual Meeting**, "Leading Change, Looking Forward: New Visions for Tomorrow's Biomedical Science," to explore new approaches for sustaining and building future research and research training programs. The meeting, which will be held September 20-22 in Nashville, will feature the keynote address by Dr. Collins, and a session with Dr. Rockey (co-chair of the Workforce Working Group) and Dr. Reed Tuckson, (co-chair of the Diversity Working Group), who will engage attendees in a conversation around the future research workforce and diversity reports. All academic leaders responsible for their institutions' research missions or

research training programs are welcome to attend.

Together with our members, the AAMC is committed to assisting the NIH leadership in evaluating these well considered, timely recommendations, and in helping to catalyze implementation of the most pressing ones, including better data collection and a much broader definition of “success” for the biomedical PhD. As Dr. Tilghman noted, “Doing nothing is not an option.”