AAMC

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Re: Request for Information: Approaches for Supporting Team Science in the Biomedical Research Community (NOT-GM-16-104)

Dear Dr. Haynes:

The Association of American Medical Colleges (AAMC) is pleased to have this opportunity to offer comments related to the support of team science. The AAMC is a not-for-profit association representing 145 accredited U.S. medical schools, nearly 400 major teaching hospitals and health systems, and more than 80 academic and scientific societies. Through these institutions and organizations, the AAMC represents nearly 160,000 faculty members, 83,000 medical students, 115,000 resident physicians, and thousands of graduate students and postdoctoral trainees in the biomedical sciences. Our comments reflect input from many of these constituents, primarily collected through our Group on Graduate Research, Education, and Training (GREAT) and Group on Research Advancement and Development (GRAND)[1]. While the Association's comments here focus on general themes, we have encouraged our member institutions to respond as well.

The following is a summary of AAMC's recommendations, described further below. NIGMS should:

- Ensure that study sections are educated to be unbiased against multi-institutional teams during grant review.

- Support research facilitating the development of software, models, templates or other tools to support the engagement and management of research teams in collaboration with the research community.

[1] The GREAT Group is AAMC's professional development group for graduate school deans, MD-PhD program directors, and postdoctoral program directors who have responsibility for biomedical PhD, MD-PhD, and postdoctoral training occurring within medical schools and teaching hospitals. GRAND is a professional development group for research deans and deans of clinical and translational research at these same institutions.

- Urge training program grant reviewers to consider the value of training as a team member and promote programs with a team-based focus.

- Facilitate collection and dissemination of curricula and tools to facilitate collaboration.

- Create a collaborative proposal (modelled after NSF), where investigators from two or more organizations collaborate on a unified research project and submit one single, focused proposal, to avoid difficulties that arise around subcontracting.

Interest in team science

AAMC appreciates the working definition of team science provided by NIGMS for the purposes of these comments. The heart of the working definition is to answer questions that cannot be answered by either a single investigator, laboratory or closely collaborative group. We agree that team science plays a vital role in addressing scientific problems that are exceptionally complex, and in making scientific discoveries that may not have been possible otherwise. Increasingly, many research questions are best answered through work in teams and in collaborations that are trans-disciplinary and can involve multiple laboratories across campuses and institutions. Fundamentally, our community's interest in team science is driven by the research questions being addressed.

Management and advisory structures in team science

For teams to be effective, transparent governance is essential. The complexity of the management and advisory structures for governing a project depends largely on the size of the team. The research community would benefit from having sample templates for different types of management structures and for various size teams, which could be developed or shared among institutions. Strong leadership and management training is also an essential component for effectively implementing team science. Models for such training should also be developed and shared across institutions. AAMC suggests that NIGMS support research which facilitates the development of software, models, templates or other tools to support the engagement and management of research teams in collaboration with the research community.

Most importantly, our constituents note that barriers continue to exist in the peer review process for team science, and especially for those teams that span multiple institutions. NIGMS should ensure that study sections are educated to be unbiased against multi-institutional teams during grant review.

Team composition

Principles of team science—the value collaborations bring to the research process and strategies to work most effectively—should be addressed throughout graduate and postdoctoral training. Training programs should not only create environments for trainees to develop in-depth discipline-based expertise, but also teach/facilitate the development of professional development skills needed to effectively conduct research in teams. For example, communication, collaboration, mentoring, teaching, and peer review, are integral skills for scientists and all play a

role in serving as a productive team member and team leader. In addition, training on such skills as defining team roles, identifying the essential elements of the team, and recognizing individuals' team contribution, should also be incorporated into training programs. Training program grant reviewers should be urged to consider the value of training as a team member and promote programs with a team-based focus.

Several institutions offer team science courses; efforts by NIGMS to facilitate collection and dissemination of these curriculum would be extremely helpful to others in the community. In addition, CTSA institutions could serve as possible models for curriculum and resource development. The research and research training communities, including members of the GREAT Group and GRAND, could assist in developing such curricula. AAMC's MedEdPORTAL, a peer-reviewed health education teaching and assessment resource exchange, is one possible avenue for dissemination.

The AAMC also recognizes the value of a diverse team. Research has shown that diverse teams are better at solving complex problems than a homogenous group.[2] AAMC applauds the NIH for establishing the Enhancing the Diversity of the NIH-Funded Workforce program, including the Building Infrastructure Leading to Diversity Initiative, National Research Mentoring Network, and Coordination and Evaluation Center, with the goal of increasing the diversity of the medical research workforce.

Resources and infrastructure

Just as we suggest that NIGMS challenge the research community to develop tools to support the management of teams, we also encourage NIGMS to catalyze the development of tools to facilitate collaboration. In order to advocate for institutions to share and not recreate existing resources, the AAMC suggests the development of a central resource hub for team science that includes team structure templates, team science training curricula as noted above, and other resources. We note that the National Cancer Institute has created a valuable a team science toolkit and urge NIGMS to consider partnering with NCI to further develop this resource.

AAMC also believes that collaborations across institutions should be encouraged. Subcontracts can present a barrier when working on a collaborative grant, as the subcontract institution may not receive as much prestige or credit for the grant as the lead institution. A possible model for NIGMS to consider is the NSF collaborative proposal, where investigators from two or more organizations collaborate on a unified research project and submit one single, focused proposal. Another example is the CTSA program, where collaborations among CTSA hubs are encouraged. A third model may be the Networks of Biomedical Research Excellence (INBRE) under the NIGMS Institutional Development Award (IDeA) program. These state-wide networks connecting research hubs with educational institutions, while they have focused on training and capacity building, have a successful and productive history based on their abilities to coordinate across multiple institutions. Just as grant applications now allow the designation of multiple

[2] Page, Scott. The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools and Societies. Princeton University Press. 2007

principal investigators on one submission, AAMC suggests that grants allow the designation of multiple institutions as co-lead institutions on a collaborative grant.

Assessment of team science
While the assessment of team science is important, both the quantity and quality of research output are not necessarily measures of team function. Study sections should be encouraged to recognize all team members that are an integral part of the team and to give due credit. However, AAMC cautions against establishing requirements that substantially increase administrative burden.

The advancement of science benefits from both formal and informal teams. Some tools that might not be useful for formal support mechanisms, however may still be valuable for informal teams. NIGMS and NIH investments in tools to support standardized data structure, analyses, and dissemination of data sets will help encourage both formal and informal team science, although we recognize that such investments are also part of BD2K and other suitably broad initiatives.

Thank you again for the opportunity to comment, and we look forward to working with the NIGMS as it considers strategies to support team science. Please feel free to contact me or my colleagues, Jodi Yellin, Director, Science Policy (jyellin@aamc.org) and Stephen Heinig (sheinig@aamc.org) with any questions about these comments.

Sincerely,

Alex Ommaya, DSc
Acting Chief Scientific Officer