



AAMC

Tomorrow's Doctors, Tomorrow's Cures®

Advancing Biomedical Research Training

The GREAT Group, 1994–2014

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The Association of American Medical Colleges (AAMC) Graduate Research, Education and Training (GREAT) Group provides professional development to and fosters the exchange of information and ideas among the faculty and administrative leaders of biomedical Ph.D., M.D.-Ph.D., and postdoctoral programs. The group functions as a national forum to help these programs achieve their goal of educating successful biomedical researchers.

This report on the past 20 years of the GREAT Group reflects upon the many issues with which the wider GREAT Group, the M.D.-Ph.D. Section, and the Postdoctorate Leaders Section have engaged, recounts the actions the GREAT Group has taken, and assesses the dynamic biomedical research training environment.

Above all, this document celebrates 20 years of growth and development of the AAMC GREAT Group and commends its members for their dedication to improving the quality of biomedical research and research training.

A BRIEF HISTORICAL OVERVIEW

The GREAT Group began as a subcommittee of the AAMC Advisory Panel on Biomedical Research, now the Advisory Panel on Research, following a recommendation that the AAMC engage graduate training programs within its member medical schools. In 1994, the AAMC hosted its first conference on graduate education titled, “Ph.D. Education in American Medical Colleges.” One hundred fifty-five medical school deans, graduate studies and research deans, faculty, and others invested in the Ph.D. training experience attended this conference.¹ The meeting’s success encouraged the association to further support the establishment of an AAMC professional development group focused on graduate education. A second annual conference, with 177 representatives from 90 medical schools in attendance, showed widespread enthusiasm for an AAMC community dedicated to biomedical research training.²

In 1996, the AAMC Executive Council, precursor to the AAMC Board of Directors, approved a proposal for a group on graduate research, education, and training. The council acknowledged the increasing importance of graduate research training programs within medical schools and the need for more administrative attention to these programs.³

Thus, the GREAT Group was formally structured as a forum through which graduate program leaders and faculty could come together to discuss common concerns, and as an entity to address the biomedical research training community’s needs for policy, advocacy, and data collection on student populations. GREAT Group members traditionally have been appointed by medical school deans from among the foremost leaders in graduate training programs at their home institutions. Additionally, the GREAT Group has included affiliate members who are active in biological sciences graduate education but may not be at an AAMC-member institution, broadening the group’s perspective.

In 2004, 10 years after its first meeting, the GREAT Group gained a new M.D.-Ph.D. Section comprising administrators and faculty of M.D.-Ph.D. programs at AAMC-member medical schools. The M.D.-Ph.D. Section grew out of a pre-existing, independent organization, the National Association of M.D.-Ph.D. Training Programs, which had met in conjunction with the National M.D.-Ph.D. Students Conference beginning in the 1990s.⁴ Becoming a section of the GREAT Group enabled M.D.-Ph.D. program leaders to join with institutional leaders of Ph.D. education and better

communicate with the broader AAMC. Every other year, M.D.-Ph.D. program leaders meet jointly with graduate deans and postdoctoral affairs leaders to discuss biomedical research training issues. In alternate years, the section meets separately to discuss M.D.-Ph.D. program-specific issues.

The GREAT Group incorporated the Postdoctorate Issues Committee in 2002, and the AAMC hosted its first Postdoctoral Leaders Conference in 2006 to gauge interest in the issues faced by trainee scientists after graduate school.⁵ In 2008, the AAMC Executive Council approved the GREAT Group's official Postdoctoral Leaders Section.



THE GREAT GROUP COMMUNITY

Many GREAT Group members have expressed their appreciation for the strong network and community of the group, and the professional development opportunities offered to faculty and administrative leaders. At annual meetings, GREAT Group members come together to share experiences, hear about their colleagues' approaches to tackling similar problems, and return to their institutions with a broadened perspective.⁶

The GREAT Group Annual Professional Development Meetings, the AAMC Annual Meeting, webinars, and the GREAT Group listserves provide opportunities for members to come together, ask questions, poll opinions, and share best practices and ideas. Additionally, the GREAT Group steering committees and other committees present an opportunity for group members to become engaged as leaders in the biomedical research training community and garner additional professional and leadership experience.

In addition to facilitating the sharing of best practices between institutional leaders, the GREAT Group as a whole periodically has paused to self-reflect. The 2003 annual meeting began with an "Envisioning GREAT" workshop that was designed to foster discussion about when the GREAT Group was most effective and useful in the past, develop a vision of how the group could be most valuable and useful in the future, and construct a series of concrete proposed actions or projects (called Provocative Propositions). GREAT Group members decided on the topics that should shape the future strategy of the group, such as Ph.D. curriculum issues, pipeline issues, postdoctoral issues, data, and professional development/learning from each other. At the 2004 annual meeting, a follow-up session emphasized continuing attention to the issues brought up during the envisioning process.

In 2012, the GREAT Group and Postdoctoral Leader Section Steering Committees joined in a strategic planning initiative to refocus on and prioritize the concerns of the biomedical research training community. The GREAT Group and Postdoctorate Leaders Section Steering Committees continue to focus on the issues they identified in 2012 through four subcommittees: mentoring, data, competencies, and future impact.

Fostering Partnerships across the AAMC

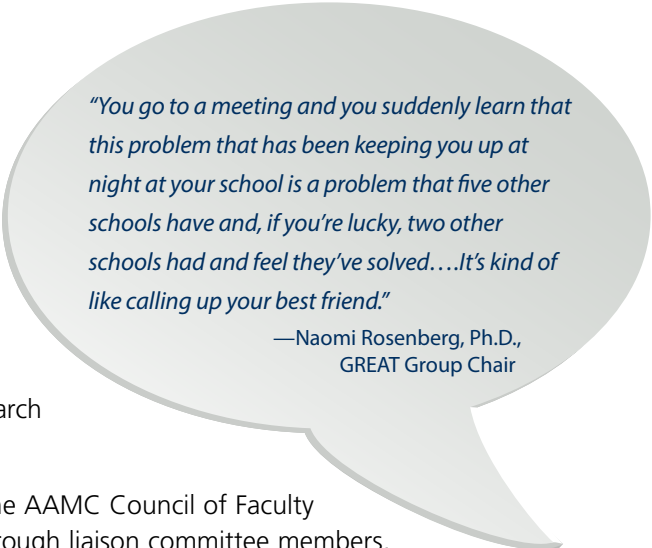
In efforts to nurture collaboration across the training environment, the GREAT Group has fostered partnerships with other AAMC professional development groups by sponsoring joint meetings, collaborating on initiatives, and sharing information. The GREAT Group's partners include the Group on Faculty Affairs, Group on Diversity and Inclusion, Group on Women in Medicine and Science, Group on Information Resources, Government Relations Representatives, and Research on Care Community.

The GREAT Group maintains relationships with the AAMC Council of Faculty and Academic Societies and Council of Deans through liaison committee members, encouraging communication across the leadership and administrative structure of academic medical centers. The GREAT Group also designates a representative to participate in the AAMC Advisory Panel on Research.

Additionally, since 2002, the GREAT Group has maintained a primary partnership with the AAMC Group on Research Advancement and Development (GRAND), a professional development group for research and clinical research deans to facilitate discussion of matters common to the research mission at AAMC-member institutions. In 2002, 2012, and 2014, the GREAT Group and GRAND joined together for their annual conferences to enable networking between members of both groups and evaluate issues important to the biomedical research training community.

Communicating with the Trainee Community

The GREAT Group has emphasized that an important institutional responsibility is to help facilitate student and postdoctorate associations and national organizations that enable graduate and postdoctoral scholars to have a voice in their own training experiences. Communicating with trainee associations enables the GREAT Group to better assess the research training culture and quality of life of students and postdoctoral scholars.

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"You go to a meeting and you suddenly learn that this problem that has been keeping you up at night at your school is a problem that five other schools have and, if you're lucky, two other schools had and feel they've solved....It's kind of like calling up your best friend."

—Naomi Rosenberg, Ph.D.,
GREAT Group Chair

The National Postdoctoral Association

Postdoctoral scholars began to gain a voice on the national stage in 2002 when the Alfred P. Sloan Foundation and *Science's* Next Wave organization coordinated the first National Postdoc Network meeting. The conference led to the formation of the National Postdoctoral Association (NPA), which held its inaugural meeting “What is the Postdoctorate of the Future?” in 2003. GREAT Group members were instrumental in helping to build the NPA and sought to formalize their relationship with them. Later that year, two NPA postdoctoral representatives were elected to serve as liaisons to the GREAT Group Postdoctorate Committee. Collaboration and communication with NPA have continued to be a priority of the GREAT Group, and NPA representatives continue to serve as part of the GREAT Group Steering Committee.

Gaining a National Perspective

Similarly, the GREAT Group has established collaborative relationships with government and other organizations like the National Institutes of Health (NIH), National Research Council (NRC), National Science Foundation (NSF), and Office on Integrity (ORI), often bringing in representatives to speak at GREAT Group conferences or committee meetings. The GREAT Group and its federal partners share feedback on projects and reports and come together to discuss important developments in the national scientific community. The NIH and the GREAT Group especially have established a strong working relationship, bringing the voices of individual institutions into conversation with government entities. By fostering partnerships and a collaborative spirit with other stakeholders in research and research training, the GREAT Group has become an important and valued voice in the biomedical research training community.

The following pages will explore many of the issues that the GREAT Group and its collaborators have engaged in over the past 20 years, from optimizing the student experience and developing institutional best practices to communicating with policymakers and promoting a talented, diverse biomedical workforce for the future.

Highlights of the GREAT Group's efforts are featured in blue boxes located at the top of each section.

OPTIMIZING EDUCATION AND TRAINING

Admissions

The GREAT Group has been engaged in discussions to improve the admissions process. For example, the AAMC's American Medical Colleges Application Service® (AMCAS®) incorporated “traffic rules” for receipt dates and other important timelines unique to M.D.-Ph.D. programs, which has greatly facilitated the application process for these programs. In 2007, the M.D.-Ph.D. Section suggested revisions to the M.D.-Ph.D. traffic rules.^{7, 8} Their discussions led to the AAMC Council of Deans Administrative Board altering AMCAS traffic rules to incorporate the unique timelines of M.D.-Ph.D. admissions procedures. For the 2015 AMCAS cycle, the “AAMC Recommendations for Medical School and M.D.-Ph.D. Admission Officers” have been revised to include updated M.D. program admissions timelines.

In considering admissions processes for biomedical research training programs, the GREAT Group has promoted holistic review of each application and endorsed mindful measures that may serve as predictors of future trainee success. The GREAT Group also has discussed ways to recruit bright students to their institutions and cultivate and sustain a pipeline of talented biomedical researchers. In all deliberations, GREAT Group members embrace the advisory role that the AAMC relies upon. Although AAMC professional development groups themselves cannot make policy for the association, their influence is widely appreciated.

Curriculum and Skills

The GREAT Group has helped shape the environment for graduate biomedical education by sharing ways in which institutions can develop modern curriculums that help trainees develop their skills and knowledge base.

- ▶ Facilitating Admissions and Recruiting Processes to Capture Talented Students
- ▶ Revising the M.D.-Ph.D. Admissions Timeline
- ▶ Developing an Institutional Infrastructure to Support Multidisciplinary Training
- ▶ Identifying Key Components of a Modern Biomedical Ph.D. Curriculum to Meet the Training Needs of the Future

Sharing institutional approaches to research training has brought up various possibilities. Early on, the GREAT Group discussed developing umbrella programs at institutions to better administer student affairs by enabling a single program to oversee functions such as recruitment, admissions, curriculum planning, and funding.⁹ Additionally, the GREAT Group has explored ways to prepare students for future careers through interdisciplinary programs and opportunities bridging multiple disciplines.

The GREAT Group has identified various components important to providing a broad and deep educational experience to Ph.D. and M.D.-Ph.D. trainees, including:

- ▶ Supporting the incorporation of more technology-based or quantitative courses to help students understand complicated data and methods
- ▶ Encouraging the development of clinical science courses to bridge the gap between medicine and basic science
- ▶ Promoting fairness in research through the inclusion of courses on ethics and encouraging faculty members to act as role models of ethical research conduct
- ▶ Preparing trainees for team science in an increasingly collaborative research environment, such as at the 2011 annual GREAT Group Conference “Redefining the Culture of Scientific Training”
- ▶ Teaching trainees to become adept communicators of science, including evaluating community service opportunities for students. In 2014, the GREAT Group collaborated with GRAND and the AAMC Advisory Panel on Research to collect illustrative examples of research trainee involvement in outreach programs.¹⁰
- ▶ Ensuring trainees develop skills that will prepare them for a dynamic and evolving research environment. The GREAT Group competencies subcommittee is compiling examples of institutional approaches to defining the skills and knowledge that trainees need.

MENTORING

Training faculty to be helpful mentors and providing resources to facilitate the mentor-mentee relationship between faculty and trainees has been a priority of the GREAT Group since its inception. In the late 1990s, a student panel convened in front of the GREAT Group to voice concerns and perspectives about mentoring.¹¹ As Roger Chalkley, Ph.D., former GREAT Group chair noted, the students helped GREAT Group members understand the facilitation of effective mentoring relationships as an institutional responsibility.

As the GREAT Group has emphasized, training students for a variety of careers is a valuable aspect of mentoring. In 1996, William (Bill) Brinkley, Ph.D., former GREAT Group chair, wrote that “graduate students who continue to be narrowly trained, i.e., “cloned” in the image of their mentors, are in danger of becoming academic dinosaurs in the new century...America is entering a new era, where versatility, innovation, and entrepreneurship must be a major ingredient of the future graduate science scholars.”¹²

In addition to promoting trainee versatility, the GREAT Group has developed tools to facilitate the relationship between mentors and mentees. In 2006, the GREAT Group published the *Compact between Postdoctoral Appointees and Their Mentors*, which outlined key tenets and commitments that both postdoctoral appointees and their mentors could use as a guideline to develop a strong mentoring relationship.¹³ The GREAT Group’s postdoctoral compact was followed in 2008 by the development of the *Compact between Biomedical Graduate Students and Their Research Advisers* to serve a similar purpose for Ph.D. students and their supporting faculty.¹⁴ The guides are available on the AAMC website as a resource for faculty and students or as a basis upon which institutions could develop their own compacts to improve mentoring relationships.

The GREAT Group has been recognized by its peer organizations as an authority on effective mentoring and has become a key part of the national discussion on trainee preparation. For

- ▶ Developing and Publishing the *Compact between Postdoctoral Appointees and Their Mentors* and the *Compact between Biomedical Graduate Students and Their Research Advisers* to Encourage Strong Mentoring Relationships
- ▶ Promoting the Use of Individual Development Plans to Help Trainees Achieve Career Goals

example, in 2010, the GREAT Group was requested to provide input on the National Institute of General Medical Sciences (NIGMS) planning effort for training and career development of biomedical graduate and postdoctoral scholars. A comment letter to NIGMS from AAMC Chief Scientific Officer Ann Bonham, Ph.D., emphasized strong mentoring relationships, trainee versatility, and individual career development as important aspects of biomedical education.¹⁵ In addition to providing resources for better mentoring to institutions, the GREAT Group has been able to engage with other organizations to discuss ways to improve mentoring of biomedical research trainees.

The GREAT Group promotes ways to encourage trainees to evaluate their career prospects and develop skills and networks to help them achieve their goals. For example, the GREAT Group encourages graduate, M.D.-Ph.D., and postdoctoral programs to support the use of tools such as the Federation for American Societies for Experimental Biology's (FASEB) Individual Development Program to help students reflect on their achievements and ambitions. As an initiative to better support postdoctoral scholars, the AAMC and GREAT Group recommended in 2013 that the NIH include individual development plans (IDPs) as a requisite component of training programs.¹⁶ In October 2014, NIH will begin to require institutions to promote the use of IDPs by their trainees supported through NIH awards.

The GREAT Group's mentoring subcommittee currently works to develop ways to assess existing mentoring programs and the biomedical research community's perceptions on what constitutes good mentoring. Overall, the GREAT Group's focus on mentoring has developed hand-in-hand with an emphasis on career guidance. Mentors are encouraged to help trainees prepare for a wide variety of careers, consistently self-reflect on their personal and professional development, and make the most of their educational experience.

PROMOTING INSTITUTIONAL BEST PRACTICES

Administrative Self-Evaluation

At the 1997 GREAT Group Conference, a task force on benchmarks of success in graduate programs was designated to develop resources to measure improvements and progress in biomedical graduate programs. In 2000, the task force's efforts culminated in the publication of *Self-Assessment of Graduate Programs in the Biomedical Sciences: Narrative Guide and Companion Survey Instruments*. A collaborative project of GREAT Group members and AAMC staff, the guide's purpose is to enable administrators to more formally assess the progress of their programs.

Measuring impact of institutional policies is important for administrators, yet difficult to do without proper survey techniques. Thus, the guide serves as a tool by which administrators could “periodically conduct a formal process of self-assessment to discern the extent to which they are meeting their goals.”¹⁷ The guide can help programs develop their own benchmarks for success and provides an appendix of instruments for institutions to qualitatively assess progress through self-assessment of administration, admissions processes, faculty and programs, student perspectives and levels of satisfaction, and outcomes for recent graduates. The self-assessment was not developed as part of a formal accreditation process, but as a tool for institutions to use in measuring their progress.

- ▶ Developing a Self-Assessment Tool to Help Administrators Better Measure the Progress of Their Programs
- ▶ Helping to Establish a Definition of a Postdoctoral Scholar
- ▶ Centralizing Postdoctoral Affairs
- ▶ Addressing Challenges to Training Physician Scientists
- ▶ Creating Awards to Share Innovative Practices

Providing for Postdoctoral Scholars

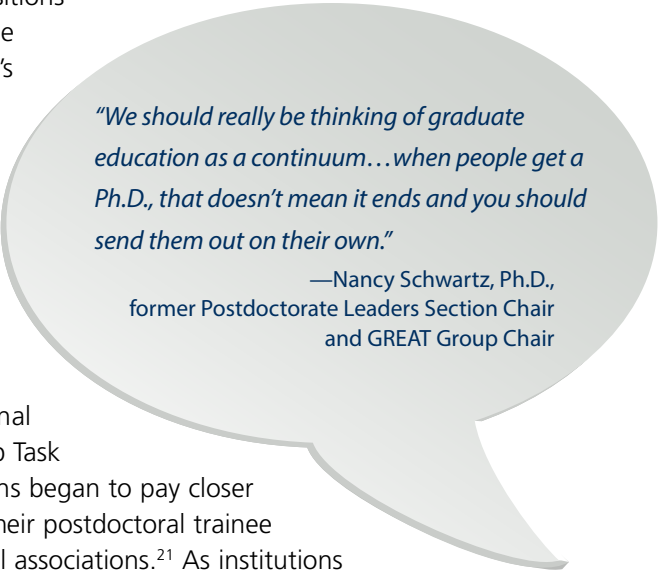
Who Are Postdoctorates?

The GREAT Group's focus on the educational experience has addressed the tenuous balance between educational priorities and research needs in biomedical research training. In a research-based context, the GREAT Group has acknowledged that continuing education of postdoctoral scholars must not fall by the wayside and trainees must be properly mentored even as they contribute to research

projects. The GREAT Group's 1998 conference facilitated discussion of the pull between research and academic priorities, sparked by the 1998 publication of the Association of American Universities (AAU) Committee on Postdoctoral Education's *Report and Recommendations*.

AAU's postdoctoral education report helped address growing dissatisfaction among postdoctoral appointees, who were often "hidden" from the national perspective or institutional administration. Both AAU and the GREAT Group recognized the lack of attention to postdoctoral affairs, as most institutions failed to collect information on how their postdoctoral scholars were progressing in their appointments or support centralized postdoctoral resources. Additionally, postdoctoral appointments were becoming lengthier, prolonging researchers' time to independence often until 35–40 years of age.¹⁸ The increasing duration of postdoctoral work caused tensions between postdoctoral scholars and their mentors. Postdoctorates often struggled to progress toward independence or tenure-track positions and often received low stipends and benefits, while putting in long years of work toward their mentor's research project.¹⁹ The GREAT Group quickly recognized this important issue, and with funding from the Burroughs Wellcome Fund, invited 10 postdoctoral scholars to attend the 1998 GREAT Group Conference to brainstorm possibilities for improvement.

In 1999, the AAMC officially endorsed the AAU's official definition of a postdoctoral appointment and accompanying recommendations with additional commentary from the newly formed GREAT Group Task Force on Postdoctoral Education.²⁰ Many institutions began to pay closer attention to the size, progress, and outcomes of their postdoctoral trainee populations and establish institutional postdoctoral associations.²¹ As institutions became more concerned with postdoctoral affairs and started to set up more postdoctoral administrative structures, trainees began to look for ways to engage with institutional structures.²² These positive changes empowered postdoctoral scholars to become increasingly involved in the changing administrative atmosphere within their respective institutions. At the GREAT Group's 1999 meeting, postdoctoral affairs were highlighted by a Postdoctoral Fellow Panel with participating

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"We should really be thinking of graduate education as a continuum...when people get a Ph.D., that doesn't mean it ends and you should send them out on their own."

—Nancy Schwartz, Ph.D.,
former Postdoctorate Leaders Section Chair
and GREAT Group Chair

postdoctoral scholars from five different institutions. Overall, postdoctoral scholars were gaining a voice in their own affairs both within institutions and through the wider reach of the GREAT Group.

Establishing the Postdoctorate Leaders Section

Despite the increased attention to postdoctoral affairs, much work had yet to be done. The GREAT Group emphasized the importance of establishing centralized procedures for postdoctoral scholars, but few institutions maintained administrations devoted to handling postdoctoral affairs. In 2000, the National Academies Committee on Science, Engineering, and Public Policy (COSEPUP) recognized this gap and developed action points for various stakeholders in postdoctoral affairs.²³ Both COSEPUP and the GREAT Group acknowledged that funding agencies and postdoctoral scholars had made efforts to address the decentralized nature of postdoctoral education, but that institutions still did not provide “the central administrative oversight of postdoctoral affairs that they maintain for undergraduate and graduate students.”²⁴ By establishing a Postdoctorate Committee, the AAMC and the GREAT Group Steering Committee hoped to foster discussion between and within institutions that would support a more centralized administration of postdoctoral affairs.

Throughout the early 2000s, issues specific to the postdoctoral community continued to be at the forefront of the GREAT Group’s discussions. The Postdoctorate Committee engaged with the burgeoning NPA, offering advice to improve the NPA’s *Recommendations for Postdoctoral Policies and Practices* and collaborating in the development of a resource guide for postdoctoral program administrators titled, *Enriching the Postdoctoral Experience: A Toolkit for Institutional Leaders and Principal Investigators*. Many GREAT Group annual meetings incorporated sessions on postdoctoral affairs. Additionally, in 2004, the GREAT Group co-sponsored the COSEPUP meeting “Second Convocation on Enhancing the Postdoctoral Experience for Scientists and Engineers.”

The first Postdoctorate Section Conference took place in 2006 in conjunction with the annual GREAT Group Conference. At the meeting, postdoctoral administrators gathered to discuss issues such as career transitions for postdoctorates, data collection on the postdoctoral workforce, and optimizing postdoctoral training. By 2008, the AAMC had approved the creation of the official Postdoctorate Leaders Section, which has prioritized support of postdoctoral offices, data collection on the postdoctorate population, and development of resources for postdoctoral leaders and administrators.

Since 2008, the Postdoctorate Leaders Section has been devoted to crafting tools for administrators of postdoctoral programs. The section’s Resources Committee worked on designing a template by

which postdoctoral offices can better collect and catalogue internal resources for postdoctorates, and collaborated on the possible expansion of the AAMC's MedEdPORTAL® to include postdoctoral training materials.

Overall, the Postdoctorate Leaders Section has continued to meet alongside the GREAT Group since 2006, with a focus on improving visibility of postdoctoral issues and maintaining a strong working relationship with the NPA. They continue to promote the centralization of postdoctoral affairs and support institutions to better provide for their postdoctoral scholars.

Training Physician Scientists

As a group invested in graduate research, the GREAT Group mainly has focused on training scientists to become basic and translational researchers. However, even before the establishment of the M.D.-Ph.D. Section, the GREAT Group strived to nurture clinical investigators and physician scientists who glide between the realms of science and medicine.

By 1999, the AAMC leadership already had established ties to M.D.-Ph.D. program directors at AAMC-member institutions and created a listserve to facilitate communication.²⁵ This informal relationship between M.D.-Ph.D. training program directors and the AAMC continued to prove supportive to the directors as their national association grew from about 35 programs in 1996 to approximately 70 programs in 2002.²⁶ In 2003, eight M.D.-Ph.D. association directors met with AAMC staff, including David Korn, M.D., AAMC vice president for biomedical and health sciences research, to begin a more official relationship between association staff and the M.D.-Ph.D. community. The move for closer ties was supported by GREAT Group membership. Later that year, the president of the M.D.-Ph.D. association, Olaf Andersen, M.D., sent a letter to M.D.-Ph.D. program directors promoting a more formal relationship with the AAMC.²⁷

Following extended discussions between the National Association of M.D.-Ph.D. Programs and the AAMC, the M.D.-Ph.D. Association member programs endorsed the creation of an AAMC GREAT Group M.D.-Ph.D. Section.²⁸ The National Association of M.D.-Ph.D. Programs and the GREAT Group M.D.-Ph.D. Section have since existed as one group under two entities, facilitating connections to both the National Association of M.D.-Ph.D. Students and AAMC resources.

The M.D.-Ph.D. Section Executive Committee, now called the Steering Committee, began meeting regularly in 2005 to set priorities and discuss issues more specific to the M.D.-Ph.D. community. The

Executive Committee established a Communications Committee to improve public visibility of M.D.-Ph.D. programs and a Data Collection Committee to analyze outcomes of M.D.-Ph.D. students. Becoming part of the AAMC community also enabled M.D.-Ph.D. programs to help streamline the application process to their programs and develop a closer relationship with the NIH.

At annual meetings, the M.D.-Ph.D. Section has continued to share best practices for administering M.D.-Ph.D. programs. For example, the 2007 M.D.-Ph.D. Section Meeting, titled “Training Physician Scientists: Models of Excellence,” was designed to facilitate the exchange of models for physician scientist training through round table discussions on institutional issues as well as multiple panels on best practices for M.D.-Ph.D. recruitment, graduate training in preclinical years, and integration of clinical experiences into graduate work. Members of the M.D.-Ph.D. Section and GREAT Group also frequently advised the AAMC’s recommendations on support of clinical investigation, including serving as representatives on the AAMC Task Force II on Clinical Research.²⁹

Moving forward, the M.D.-Ph.D. Section continues to share innovative ways to administer M.D.-Ph.D. programs, find a balance between clinical and research training and recruit and support students.

Building Bridges and Spanning Boundaries Awards

As part of its efforts to support institutional advancements in research training and education, the GREAT Group and GRAND have sponsored the Building Bridges and Spanning Boundaries Award since 2012. The inaugural award was developed in an effort to reward leaders of Ph.D., M.D.-Ph.D., and postdoctoral programs for innovative practices and partnerships that improve research and research training. Each year, winners are selected by a panel of leaders from AAMC-member institutions and are announced at the annual GREAT Group conference.

The 2013 award specifically targeted creative institutional partnerships, reinforcing the GREAT Group’s position as a network of institutions and a forum for identifying and sharing best practices. Additionally, through a partnership between the GREAT Group and GRAND, the award also has emphasized the strong relationship between the research and the research training community. The 2014 award is designed to reward institutions for innovative institution-community partnerships and maximization of research efficiency in ways that improve scientific progress and emphasize the important position of academic medical centers within the larger community.

COMMUNICATING AND COLLABORATING

An Advocate for Research Training

As deans of research and graduate programs mobilized for the first AAMC graduate education meeting in 1994, the AAMC already was establishing itself as an important stakeholder in the future of biomedical research training and as a credible voice in the biomedical community.

In 1993, Thomas Malone, Ph.D., vice president of biomedical research at the AAMC, presented to the NRC Committee on *National Needs for Biomedical and Behavioral Research Personnel* to communicate AAMC-member institutions' investment in the future of research and research training.³⁰ Dr. Malone claimed that with approximately "62 percent of all National Research Service Award (NRSA) funding going to academic medical centers and their trainees, issues of research training are of great interest" to the medical schools, teaching hospitals, and professional societies included in the AAMC membership.³¹

Dr. Malone highlighted that research training support must be carefully structured to incentivize young and talented trainees to pursue careers in research and ensure the continuing achievement of American researchers. He identified barriers, such as the stagnation of stipend levels and the lack of available, affordable loan payment plans, which would need to be addressed to better support research trainees.³² In 1994, the committee published its report, *Meeting the Nation's Needs for Biomedical and Behavioral Scientists*. Their evaluation of the NIH NRSA program closely echoed Dr. Malone's statement on the importance of attracting and funding exceptional talent.³³

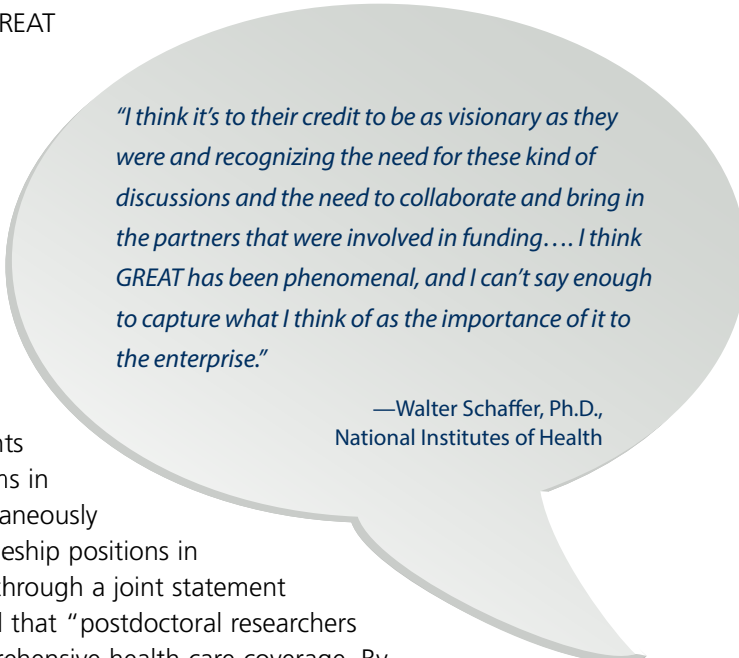
Although the AAMC already had engaged in national discussions of research training, forming the GREAT Group enabled institutions to come together to participate in advocating for increased national support for research training. The GREAT Group has maintained close connections to NIH efforts to develop support for research education and training programs. Walter Schaffer, Ph.D., of the NIH, credits the AAMC and GREAT Group for enabling the NIH to act with "boots on the ground...making sure that the programs and the policies and procedures associated with them that we wanted to put into place are...going to work."³⁴ The GREAT Group offers an institutional

- ▶ Communicating the Importance of Research Training to Advancing Medical Progress
- ▶ Contributing to National Discussions of the Research Training Environment
- ▶ Providing a Voice to Trainees

perspective to the NIH and enables medical schools to better voice their opinions on the state of research funding.

The AAMC and GREAT Group have supported the NIH in its pursuit to bolster the research and research training environment. In a 2001 letter from former AAMC President Jordan J. Cohen, M.D., to Dr. Schaffer, the AAMC approved of NIH efforts to increase stipends for trainees and provide health care benefits for both graduate students and postdoctoral scholars.³⁵ In 2003, the GREAT Group developed a statement, endorsed by the AAMC Executive Council, in favor of increased NIH funding.³⁶ The statement underlined the AAMC's support of increased investment in research training as fundamental to attracting talented students to careers in biomedical research.

In 2006, after the NIH doubling period had passed and NIH funding became more constrained, the AAMC submitted comments to NIGMS on how to best involve institutions in changes to NRSA funding policies to simultaneously protect trainee stipends and preserve traineeship positions in the face of limited funding.³⁷ Additionally, through a joint statement with FASEB in 2006, the AAMC maintained that "postdoctoral researchers must have funding for and access to comprehensive health care coverage. By working together to provide these critical benefits, funding and training institutions can enhance the attractiveness of careers in biomedical research."³⁸ Throughout its history, the GREAT Group successfully has emphasized the importance of fair and equitable oversight of stipends and benefits by institutions for graduate students and postdoctoral scholars.

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"I think it's to their credit to be as visionary as they were and recognizing the need for these kind of discussions and the need to collaborate and bring in the partners that were involved in funding.... I think GREAT has been phenomenal, and I can't say enough to capture what I think of as the importance of it to the enterprise."

—Walter Schaffer, Ph.D.,
National Institutes of Health

Giving Trainees a Voice

The AAMC and GREAT Group recently began to include the input of individual trainees in advocating for increased investment in research and research training. In 2013, the AAMC rallied graduate students, M.D.-Ph.D. students, and postdoctoral trainees to submit a sign-on letter to Congress in support of NIH funding. More than 2,400 students and post-docs generated more than 7,200 letters to their senators and representatives, sending a strong signal about the importance of NIH funding and bringing the perspectives of new and future biomedical scientists to the attention of Congress. Through this initiative, the GREAT Group encouraged trainees to participate in the AAMC effort to advocate for increased investment in the NIH and voice their opinions on a national level.

SHAPING THE BIOMEDICAL WORKFORCE

Preparing for a Variety of Opportunities

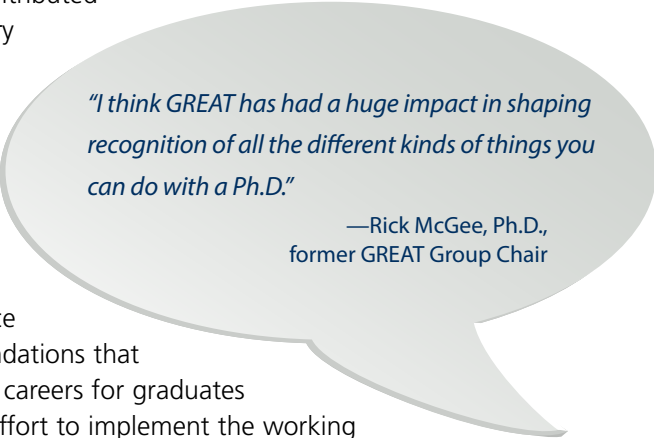
The GREAT Group continuously has emphasized that biomedical Ph.D. students pursue a wide variety of careers in academia, government, industry, science journalism, and other fields. In 1995, the GREAT Group's second annual meeting "Reassessing the Biomedical Degree: Doing the Right Thing?" highlighted the importance of versatile training in building a talented biomedical workforce. Meeting attendees focused on a COSEPUP report titled, *Reshaping the Graduate Education of Scientists and Engineers*, which claimed that "more than half of new graduates with Ph.D.'s...now find work in nonacademic settings."³⁹ Through discussions of curriculum and career preparation tools, the GREAT Group considered how to best prepare graduate students in the biomedical sciences for future careers and opportunities.

Realizing that graduates were pursuing a wider assortment of careers, the GREAT Group focused on improving the quality of professional development and career preparation programs. In 1995, the GREAT Group hosted a panel of students who had explored careers such as science journalism, intellectual property law, and public policy, emphasizing the growing breadth of student experiences. The 1995 meeting helped to solidify another purpose of the GREAT Group: to analyze national research workforce concerns with a focus on biomedical research trainees.

In 1998, NRC published a report, *Trends in Early Careers of Life Scientists*, to assess the typical career paths of recent Ph.D. graduates, trends in the research workforce, and provide recommendations for policy decisions going forward.⁴⁰ An article authored by Gina Shaw in the February 1999 AAMC Reporter "Ph.D.issatisfaction: Is a Rising Tide of Ph.D.'s Swamping Career Opportunities?" quoted Susan Gerbi, Ph.D., the GREAT Group's chair at the time, who asserted that properly preparing graduate students for the workforce would require both rigorous scientific training and a broad acceptance of the various careers students would choose to pursue.⁴¹

- ▶ Preparing the Future Workforce by Promoting Versatility in the Pipeline
- ▶ Encouraging Students to Consider a Wide Variety of Career Opportunities
- ▶ Exploring Career Development Opportunities for Physician Scientists
- ▶ Providing for Postdoctoral Fellows and Helping Them Achieve Independence

In 2011, input from GREAT Group members contributed to an AAMC comment letter to the NIH Advisory Committee to the Director (ACD) Biomedical Workforce Working Group, providing an institutional perspective on the future of the biomedical research workforce. The letter acknowledged “profound changes in the nation that also affect the environment for research training, career development, and workforce.”⁴² In 2012, the Biomedical Workforce Working Group published a series of recommendations that reflected the widening variety of outcomes and careers for graduates of biomedical Ph.D. programs.⁴³ As part of an effort to implement the working group’s recommendations, the NIH introduced the Broadening Experience in Scientific Training (BEST) Awards. GREAT Group members have received BEST Awards for their work in expanding possible pathways available to biomedical graduate students. Eight out of 10 first-round BEST awards went to active GREAT Group member institutions.

A light gray speech bubble containing a quote and attribution.

“I think GREAT has had a huge impact in shaping recognition of all the different kinds of things you can do with a Ph.D.”

—Rick McGee, Ph.D.,
former GREAT Group Chair

By emphasizing the many opportunities available to graduate students in the biomedical sciences, and transitioning away from labeling these careers as “alternative,” the GREAT Group helps encourage students and strengthen the biomedical research workforce and community.

The Road to Research

The AAMC has been a longtime supporter of clinical research initiatives, encouraging federal support for clinical research and training. In 2007, the AAMC Task Force II on Clinical Research published its report, *Recruitment of New Physician Investigators in Clinical Research: Findings from a Survey of Clinical Department Chairs at U.S. Medical Schools*. The survey of chairs of patient-oriented research departments included many GREAT Group M.D.-Ph.D. Section members, demonstrating the AAMC’s efforts to understand and develop future opportunities for young physician scientists.⁴⁴

In 2013, AAMC Chief Scientific Officer Ann Bonham, Ph.D., presented a statement with detailed data and recommendations to the NIH ACD Physician Scientist Workforce Working Group. The

comments were intended to assist in the development of the recently published NIH ACD Physician Scientist Workforce Working Group report, demonstrating the continuing focus of the national research community on the future of clinical research.⁴⁵ The M.D.-Ph.D. Section provides an institutional perspective to the NIH in their efforts to bolster physician scientist training programs and support the clinical research and research training environment.

Similarly, young biomedical Ph.D.'s who chose to pursue careers in research often find themselves struggling to become independent researchers or establish a career in academia after receiving their degree. Allan Shipp, M.H.A., of the NIH and former GREAT Group Executive Secretary, calls this a "sort of plight of postdocs who end up doing one, two, three postdocs in a row because they can't find an academic position or a position that otherwise fulfills their career expectations."⁴⁶ In a 2005 report, *Fostering the Independence of New Investigators in Biomedical Research*, the NRC's Committee on Bridges to Independence published their concerns about the length of postdoctoral appointments and the age at which researchers receive their first independent grants.⁴⁷ In 2006, the NIH established an important new investigator program with a K99/R00 award to encourage young postdoctorates and graduates in their transition to independence. Overall, the GREAT Group has been supportive of efforts to establish a more supported, more efficient career path for postdoctoral scholars and young independent researchers.

COLLECTING DATA

By 1995, debates over proper supply and demand levels for graduate enrollment in science and engineer programs had sparked efforts to quantitatively depict the size of the graduate student population and model the demand for Ph.D.'s. Like other stakeholders in the biomedical research training environment, the AAMC has emphasized quantitative measurement of the biomedical trainee population as part of its focus on Ph.D. education.

The AAMC embarked on a survey project of Ph.D. students enrolled in U.S. medical schools in order to form a database of training information in 1994, just as it began to host annual graduate research education and training conferences. A survey of U.S. medical schools was administered twice from 1994 to 1996. The purpose of the survey was to determine the size of the biomedical Ph.D. and M.D.-Ph.D. population at medical schools specifically, emphasizing the important stake of the AAMC and GREAT Group in graduate biomedical education. Stanley Ammons and Douglas Kelly's subsequent report in 1997, *Profile of the Graduate Student Population in U.S. Medical Schools*, determined that "when compared with the 1995 data for 18 biomedically related biological science disciplines from the National Research Council's Survey of Earned Doctorates, the AAMC survey indicate[d] that approximately 60 percent of the 4,000 Ph.D.'s awarded were earned by students studying at U.S. medical schools."⁴⁸ These findings quantitatively solidified the AAMC's stake in the future of biomedical research training because approximately "25 to 30 percent of the number of students currently enrolled at all accredited U.S. medical schools" were biomedical Ph.D. students.

Subsequently, a GREAT Group Task Force on Outcomes developed a survey instrument and completed a pilot survey of seven GREAT Group institutions. The committee found that many schools failed to track students after graduation and emphasized future efforts to develop better student tracking methods.

The AAMC and GREAT Group have highlighted the need for improved data collection at both the institutional and national level in order to aggregate data on the biomedical research trainee

- ▶ Collaborated on the "Profile of the Graduate Student Population in U.S. Medical Schools"
- ▶ Improving Tracking of M.D.-Ph.D. Students
- ▶ Collecting Data on the Postdoctorate Population
- ▶ Sharing Models of Institutional Data Collection at Institutions

population. In a comment letter to the NIH ACD Diversity Working Group, the AAMC stressed the importance of “evidence based metrics to track progress on these important issues going forward.”⁴⁹ Both the reports of the NIH ACD Biomedical Workforce Working Group and the NIH ACD Working Group on Diversity recommend initiatives to improve data collection on the research training population.^{50,51} Improved data collection helps the GREAT Group and the wider research training community better track student populations, career outcomes, and the impact of new initiatives.

M.D.-Ph.D. Tracking and Outcomes

Prior to 2005, data collection on M.D.-Ph.D. program applicants and matriculants was complicated by the lack of distinguishing features in applications for M.D. programs and M.D.-Ph.D. dual degree programs. While the M.D.-Ph.D. Section of the GREAT Group was still being established, the AAMC was in the process of adding M.D.-Ph.D. dual degrees as a program type to AMCAS and two application essays specific to M.D.-Ph.D. applicants. Both of these changes to AMCAS were instrumental in improving tracking of M.D.-Ph.D. applicants and students.

In its first year, the M.D.-Ph.D. Section appointed a Data Collection and Analysis Committee to lead the section’s data and research initiatives. The committee initiated a number of projects to facilitate better data collection. The AAMC and M.D.-Ph.D. programs decided to continue an existing yearly data match project to identify inconsistencies in automatic AAMC Student Records Systems (SRS) data collection, such as which schools failed to report adequate data.⁵² The committee also reached out to M.D.-Ph.D. programs for information about applicants who had been invited for interviews and received widespread feedback from both Medical Scientist Training Program (MSTP) and non-MSTP institutions, suggesting that data collection on interviewees was fairly feasible.

To begin their outcomes tracking project, the data committee asked schools to share their current methods or questionnaires for tracking alumni. Their responses were used to spark a discussion of how to best collect data on alumni outcomes and how to improve and standardize M.D.-Ph.D. alumni-tracking tools. Over the past few years, the Data Committee and AAMC staff have worked with M.D.-Ph.D. programs and medical school registrars to collect and confirm the identities of M.D.-Ph.D. students and alumni. A project to survey these alumni is currently in development, demonstrating the continuing efforts of the M.D.-Ph.D. Section to improve data collection with regards to the physician scientist workforce and pipeline.

Data for Postdoctoral Affairs

In earlier years, collecting data about postdoctoral scholars often was difficult because of the lack of oversight over postdoctoral affairs and the ambiguity as to which research trainees should be considered as postdoctoral scholars. After having helped to establish the definition of a postdoctoral scholar in the late 1990s, the GREAT Group was better equipped to develop data collection models to better measure the postdoctorate population. In 2003 and 2004, GREAT Group members completed a survey of 47 institutions to investigate administrative practices for postdoctoral affairs.⁵³ The survey helped the GREAT Group to measure the progress and development of postdoctoral offices at various institutions and encourage all institutions to keep focusing on postdoctoral affairs.

In 2005, Sigma Xi released the results from their survey of 7,600 postdoctoral scientists at 46 U.S. research institutions. The survey enabled the biomedical research training community to better understand a variety of factors including demographics, levels of satisfaction, career expectations, salaries, benefit levels, and the balance between research and education.⁵⁴ GREAT Group institutions could use Sigma Xi's extensive research on postdoctorates as a way to evaluate their own impact on the postdoctorate population and the needs of postdoctoral trainees. The Postdoctorate Leaders Section has continued the GREAT Group's commitment to collect and maintain data on the postdoctorate population through informal institutional surveys.

Institutional Approaches to Tracking Biomedical Research Trainee Information

Since 2012, a subcommittee of the GREAT Group has been focused on understanding how institutions collect data regarding their students and postdoctorates. The committee seeks to better comprehend approaches to acquiring data and facilitate networking of best practices for institutional data collection, mirroring a recommendation of the NIH ACD Biomedical Workforce Working Group that graduate students and postdoctoral trainee outcomes and metrics be collected. Acquiring data is important to developing a better understanding of the research trainee population as well as providing potential and current trainees with information about programs and outcomes to help inform training and career decisions. The committee is currently in the process of completing a project identifying variances in institutional approaches to share as examples with the rest of the GREAT Group.

BUILDING AND SUPPORTING A DIVERSE WORKFORCE

As a forum of institutions, the GREAT Group fosters collaborative efforts to enhance support for students underrepresented in research. As Rick McGee, Ph.D., former GREAT Group chair, recently remarked, “over time major universities have devoted more energy to promoting diversity within their research training programs. Additionally, beginning in the late 1990s, the NIH began to incorporate requirements in training grants to encourage institutions to develop mechanisms that cultivate diverse programs.”⁵⁵ GREAT Group institutions have come together to focus on opportunities for students underrepresented in research in task forces and meetings such as the 2010 GREAT Group Annual Conference “Enhancing Diversity and Sustaining Career Success.”

- ▶ Fostering Collaboration between Research Institutions
- ▶ Developing a Pipeline of Students Underrepresented in Research
- ▶ Supporting Professional Development Opportunities for Women
- ▶ Considering Challenges for International Scholars

The commitment of GREAT Group members to diversity readily aligns with the initiatives of the AAMC. In his first years as AAMC president, Darrell G. Kirch, M.D., oversaw the establishment of two AAMC professional development groups, the Group on Diversity and Inclusion and the Group on Women in Medicine and Science. Ann Bonham, Ph.D., who joined the AAMC in 2009 as chief scientific officer, expressed her own passion to advance the participation of women and minorities in research through her first keynote address to the GREAT Group and in subsequent presentations.

Additionally, the GREAT Group has remained supportive of burgeoning opportunities for women in science. The GREAT Group has discussed opportunities to encourage gender diversity in the biomedical research workforce at annual meetings, such as in a 2005 session focused on career development strategies for women. The scientific community has remained determined to improve support for female researchers and research trainees. For example, in 2006, COSEPUP published their report *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*, and the NIH has been intent to promote gender diversity in research institutions supported by NIH programs.⁵⁶

Similarly, the GREAT Group hopes to encourage international scholars who may have trouble navigating the complexities of moving to an unfamiliar place. By promoting the centralization of postdoctoral affairs and administration and equitable and fair support for graduate, postdoctorate, and physician scientist trainees, the GREAT Group works to develop an environment that helps international scholars succeed.

In 2012, with feedback from the GREAT Group and Group on Diversity and Inclusion, the AAMC provided input to the NIH ACD Working Group on Diversity, writing that “[d]espite numerous efforts over many years to build pathways for diversity into the biomedical research workforce pipeline, barriers to sustained career advancement persist.”⁵⁷ The working group, which included Ann Bonham, Ph.D., published a report in 2012 with a number of recommendations for building diversity in research training programs.⁵⁸ As a result, three new NIH initiatives have been developed: the National Research Mentoring Network (NRMN) to facilitate mentorship of students underrepresented in research, Building Infrastructure Leading to Diversity (BUILD) awards for institutions developing innovative programs that encourage diversity, and the Coordination and Evaluation Center (CEC) to bring together recipients of NIH diversity program awards.⁵⁹ GREAT Group members have been active in implementing the recommendations of the Working Group on Diversity, demonstrating AAMC support for NIH diversity initiatives. Overall, the GREAT Group has remained engaged with issues of diversity in the biomedical research training community, encouraging underrepresented minorities, women, and international scholars to succeed in developing careers in research.



OUTREACH TO BUILD THE PIPELINE

Since the early 2000s, the GREAT Group has worked to increase visibility of Ph.D. and M.D.-Ph.D. programs among potential applicants and current students and administrators. Various committees have contributed to developing outreach materials to serve as resources for students considering careers in biomedical research.

M.D.-Ph.D. Communications

In 2005, the M.D.-Ph.D. Section established the Communications Committee to help update the section's website and increase public awareness of M.D.-Ph.D. programs. The committee succeeded in developing the *M.D.-Ph.D. Training and Careers* guide for the AAMC website in 2008 as a resource for students interested in M.D.-Ph.D. programs. Additionally, the committee organizes workshops at various venues to reach out to students and faculty, such as meetings of the National Association for Advisors for the Health Professions (NAAHP), NIH Graduate and Professional Fairs, the AAMC Minority Fair, conferences for the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), and the Annual Biomedical Research Conference for Minority Students (ABRCMS). Reaching out to students underrepresented in research has been key to building and supporting a diverse workforce, as the GREAT Group often has emphasized.

The Communications Committee's efforts span both medicine and biomedical research, reflecting the dual emphasis of M.D.-Ph.D. programs. In collaboration with the GREAT Group Ph.D. Outreach Committee, the M.D.-Ph.D. Section Communications Committee produced online resources for "Considering a Career in Medical Research" to provide information and resources for students potentially interested in biomedical research. A M.D.-Ph.D. training brochure is published on the AAMC website and provides another useful resource for students looking into M.D.-Ph.D. programs.

- ▶ Organizing Outreach Efforts to Promote Ph.D. and M.D.-Ph.D. Programs
- ▶ Developing Brochures for the AAMC website to Provide Resources for Potential Students
- ▶ Creating the Website "Considering a Career in Medical Research"
- ▶ Facilitating Resource Sharing within the Biomedical Research Training Community

Ph.D. Outreach

In order to bolster the pipeline for the biomedical research workforce, the GREAT Group has considered efforts to enhance science training from K-12 education to postdoctoral professional development. In 2002, GREAT's Pipeline Working Group met for the first time to discuss possible efforts to better expose young students to biomedical research and advise talented undergraduate students on how to pursue research careers. The Pipeline Working Group identified issues related to the pipeline for biomedical researchers and developed ideas to address their concerns.

In 2008, the GREAT Group formed the Aspiring Biomedical Scientists Committee (GABS), now called the Ph.D. Outreach Committee, to develop resources for students considering biomedical research training. GABS published informational brochures, a website with resources, and collaborated with the M.D.-Ph.D. Section Communications Committee on the AAMC's online resource "Considering a Career in Medical Research." The Ph.D. Outreach Committee also organizes workshops at various national meetings to reach out to students, parents, and advisors, with an emphasis on reaching students underrepresented in research.

Resource Sharing

To facilitate the continuing educational experience, GREAT Group outreach efforts also have been directed toward current students, postdoctorates, and faculty. In 2010, GREAT Group representatives collaborated with MedEdPORTAL in an effort to facilitate the availability of educational resources for graduate students and postdoctorates. They succeeded in helping streamline MedEdPORTAL to be more inclusive of materials related to research training and provide a space for the collection of resources for research faculty and trainees.

Currently, a GREAT Group future impact subcommittee is focused on designing methods to collect resources on career development for graduate students and postdoctorates. By facilitating the sharing of resources and materials, the GREAT Group continues to emphasize the importance of reaching out to and providing for young scholars.

Over the past 20 years, the GREAT Group has built initiatives, programs, and resources that help advance research training by increasing the capabilities of member institutions and the broader research training community. The GREAT Group has been instrumental in strengthening the collective research training voice nationally and in promoting efforts to improve graduate and postdoctoral research education and training.

This report was completed by Sarah Howells, AAMC Summer 2014 Intern, under the mentorship of Jodi Yellin, Ph.D., GREAT Group program leader. Thank you to Jodi Yellin, Ph.D., Irena Tartakovsky, M.D., Stephen Heinig, and Ann Bonham, Ph.D., of the AAMC for their review of this report.

Thank you to the following GREAT Group members and collaborators who generously gave their time and insight to interviews:

Roger Chalkley, D.Phil., Vanderbilt University, Former Chair of the GREAT Group

Richard McGee, Ph.D., Northwestern University, Former Chair of the GREAT Group

Naomi Rosenberg, Ph.D., Tufts University, Current Chair of the GREAT Group

Walter Schaffer, Ph.D., Office of Extramural Research, National Institutes of Health

Nancy Schwartz, Ph.D., University of Chicago, Former Chair of the GREAT Group and Former Chair of the Postdoctorate Leaders Section

Allan Shipp, M.H.A., Office of Biotechnology Activities, National Institutes of Health; Former Assistant Vice President for Biomedical and Health Sciences Research at the AAMC

GREAT GROUP ANNUAL MEETINGS

Date	Title	Location	Chair
Oct. 8–10, 1994	Ph.D. Education in American Medical Colleges	Ft. Lauderdale, FL	
Oct. 7–9, 1995	Reassessing the Biomedical Degree: Doing the Right Thing?	Ft. Lauderdale, FL	William Brinkley, Ph.D.
Oct. 11–14, 1996	The Biomedical Ph.D. Degree: A Quest for Continuous Improvement	Scottsdale, AZ	Karen Holbrook, Ph.D.
Sept. 25–28, 1997	Attracting, Supporting, and Retaining the Best	Leesburg, VA	Karen Holbrook, Ph.D.
Oct. 9–12, 1998	The Changing Face of Graduate Education	Palm Springs, CA	David Meyer, Ph.D.
Oct. 8–11, 1999	Educating the Scientific Workforce to Meet Tomorrow's Research Needs	Hamilton, Bermuda	Susan Gerbi, Ph.D.
Oct. 15–17, 2000	The Biomedical Ph.D.: Taking Stock of the Degree and the Profession	Savannah, GA	Thomas Fox, Ph.D.
April 26–28, 2002	The Interdisciplinary Nature of the Biomedical Sciences	Westminster, CO	Brenda Russell, Ph.D.
April 26–28, 2003	GREAT Visions of the Future of Biomedical Research Education and Training	Montreal, Quebec, Canada	Richard McGee, Ph.D.
April 24–26, 2004	Implementing a GREAT Vision for Biomedical Education	Austin, TX	Gayle Slaughter, Ph.D.
Oct. 15–17, 2005	The Future of the Biomedical Science Workforce	Fort Myers, FL	Joel Oppenheim, Ph.D.
October 7–9, 2006	Redefining Research Training	Tucson, AZ	Trevor Penning, Ph.D.
Oct. 19–22, 2007	Meeting the Challenge	Providence, RI	Nancy Schwartz, Ph.D.
Oct. 3–5, 2008	Integrating Research Education and Training at Medical Centers: Opportunities, Challenges, and Solutions	Seattle, WA	Allan Yates, M.D., Ph.D.
Oct. 23–25, 2009	Innovation and Optimization of Graduate Student and Postdoctorate Learning and Development	St. Louis, MO	Henry Wortis, M.D.
Oct. 21–23, 2010	Enhancing Diversity and Sustaining Career Success	New Orleans, LA	Roger Chalkley, D.Phil.
Oct. 13–15, 2011	Redefining the Culture of Scientific Training	Savannah, GA	Nancy Street, Ph.D.
Sept. 20–22, 2012	GREAT-GRAND Joint: Leading Change, Looking Forward: New Visions for Tomorrow's Biomedical Science	Nashville, TN	Wayne Thomas McCormack, Ph.D.
Sept. 19–21, 2013	Evolution of the Training Paradigm: Developing the Biomedical Workforce of the Future	Atlanta, GA	Michael Verderame, Ph.D.
Sept. 18–20, 2014	GRAND, GREAT, and Postdoctorate Leaders Section: Partnering with Faculty and Trainees to Navigate a Dynamic Biomedical Research Landscape	Fort Worth, TX	Naomi Rosenberg, Ph.D.

M.D.-PH.D. SECTION ANNUAL MEETINGS

Date	Title	Location	Chair
Oct. 17, 2005	M.D.-Ph.D. Section Annual Meeting	Fort Myers, FL	Olaf Sparre Andersen, M.D.
Oct. 5–6, 2006	M.D.-Ph.D. Section Annual Meeting	Tucson, AZ	Arthur Gutierrez-Hartmann, M.D.
July 26–28, 2007	Training Physician Scientists: Models of Excellence	Keystone, CO	Skip Brass, M.D., Ph.D.
Oct. 2–4, 2008	Advancing the Training of Physician Scientists: M.D.-Ph.D. Programs and Beyond	Seattle, WA	David Engman, M.D., Ph.D.
July 23–25, 2009	Combined Degree Careers in a Non-Expanding Universe	Keystone, CO	Clayton Wiley, M.D., D.Phil.
Oct. 21–23, 2010	Enhancing Diversity and Sustaining Career Success	New Orleans, LA	M. Kerry O'Banion, M.D., Ph.D.
July 28–30, 2011	Training the Modern Day M.D.-Ph.D. Workforce: Rich Opportunities and New Challenges	Minneapolis, MN	Myles Akabas, M.D., Ph.D.
Sept. 20–22, 2012	GREAT-GRAND Joint: Leading Change, Looking Forward: New Visions for Tomorrow's Biomedical Science	Nashville, TN	Robin G. Lorenz, M.D., Ph.D.
Sept. 19–21, 2013	Evolution of the Training Paradigm: Developing the Biomedical Workforce of the Future	Atlanta, GA	Joseph T. Barbieri, Ph.D.
July 17–19, 2014	M.D.-Ph.D. Training: Future and Opportunities	Bethesda, MD	Dianna J. Milewicz, M.D., Ph.D.

POSTDOCTORATE LEADERS SECTION ANNUAL MEETINGS

Date	Title	Location	Chair
Oct. 9–10, 2006	Postdoctorate Leaders Section Annual Meeting	Tucson, AZ	John Russell, Ph.D., and Nancy Schwartz, Ph.D.
Oct. 19, 2007	Postdoctorate Leaders Section Annual Meeting	Providence, RI	Philip Clifford, Ph.D., and John Russell, Ph.D.
Oct. 2–4, 2008	Fostering the Evolution of the Postdoctoral Experience	Seattle, WA	Philip Clifford, Ph.D.
Oct. 23–25, 2009	Innovation and Optimization of Graduate Student and Postdoctorate Learning and Development	St. Louis, MO	Joan Lakoski, Ph.D.
Oct. 21–23, 2010	Enhancing Diversity and Sustaining Career Success	New Orleans, LA	Nancy Schwartz, Ph.D.
Oct. 13–15, 2011	Redefining the Culture of Scientific Training	Savannah, GA	Lisa Kozlowski, Ph.D.
Sept. 20–22, 2012	GREAT-GRAND Joint: Leading Change, Looking Forward: New Visions for Tomorrow's Biomedical Science	Nashville, TN	Richard F. Rest, Ph.D.
Sept. 19–21, 2013	Evolution of the Training Paradigm: Developing the Biomedical Workforce of the Future	Atlanta, GA	Edward Krug, Ph.D.
Sept. 18–20, 2014	GRAND, GREAT and Postdoctorate Leaders Section: Partnering with Faculty and Trainees to Navigate a Dynamic Biomedical Research Landscape	Fort Worth, TX	Ambika Mathur, Ph.D.

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 - The appointee was recently awarded a Ph.D. or equivalent doctorate (e.g., Sc.D., M.D., in an appropriate field).
 - The appointment is temporary.
 - The appointment involves substantial full-time research or scholarship.
 - The appointment is viewed as preparatory for a full-time academic and/or research career.

- The appointment is not part of a clinical training program.
 - The appointee works under the supervision of a senior scholar or a department in a university or similar research institution (e.g., national laboratory, NIH, etc.).
 - The appointee has the freedom, and is expected, to publish the results of his or her research or scholarship during the period of the appointment
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 - 35 AAMC "Letter on NIH Statement in Response to Addressing the Nation's Changing Needs for Biomedical and Behavioral Scientists" April 30, 2001.
 - 36 The statement read: "During its January 2003 meeting held in Washington, D.C., the AAMC Group on Graduate Research, Education, and Training (GREAT) Steering Committee discussed the continued need to increase stipend levels for biomedical graduate students and postdoctoral fellows. Many factors have led to concern that the NIH budget will grow, at best, very slowly over the next few years. Despite the implications of such a budgetary challenge, the AAMC urges the NIH to fulfill its commitment to increase the stipends of graduate students and postdoctoral fellows 10 through 12 percent per year for the next several years, as articulated in the March 26, 2001, "NIH Statement in Response to Addressing the Nation's Changing Needs for Biomedical and Behavioral Scientists," even if this will require a decrease in the number of graduate students and postdoctoral fellows supported. In particular, postdoctoral fellow stipends remain very low in view of their high levels of education

- and the irreplaceable contributions of these individuals to biomedical research in the United States. The planned increases are essential if biomedical research is to remain an attractive career option for the brightest U.S. students. Attracting the most talented students and postdoctoral fellows is essential if the United States is to retain its position of world leadership in biomedical and behavioral research.”
- 37 Cohen, J. (2005, November 4). Letter to Warren C. Jones re: NIH Town Hall Meeting on Ruth L. Kirschstein National Research Service Award (NRSA) Tuition, Fees, and Health Insurance Policies. Association of American Medical Colleges.
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 - 51 Working Group on Diversity in the Biomedical Research Workforce, The Advisory Committee to the Director. (2012). *Draft Report of the Advisory Committee to the Director on Diversity in the Biomedical Research Workforce*. National Institutes of Health, [3].
 - 52 This pre-existing data analysis matched AAMC Enrollment Services Student Records System (SRS) data and manual data collected by Data Committee co-chair Linda Burnley.
 - 53 In 2004, 70 percent of institutions had established a definition of a postdoctoral appointment, with 91 percent of those institutions using the AAU definition endorsed by GREAT. Additionally, the survey demonstrated that 68 percent of institutions had a dedicated administrative organization in 2004 (60 percent in 2003), that 49 percent of institutions had a postdoctoral association in 2004 (36 percent in 2003).

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