Association of American Medical Colleges
and
Association of Professors of Medicine
Forum

"The Physician-Scientist Workforce: A Workshop for Clinical Faculty Leaders"

Executive Summary

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Recognizing the critical role of physician-scientists in conducting patient-oriented research, the Association of American Medical Colleges (AAMC) and the Association of Professors of Medicine (APM) have led efforts to address the growth, diversity, and revitalization of the physician-scientist workforce. Through the work of the AAMC Task Force II on Clinical Research and the APM Physician-Scientist Initiative, organizational and structural obstacles have been addressed, and substantive and potential solutions for resolving these issues have been articulated.

The AAMC-APM forum, "The Physician-Scientist Workforce: A Workshop for Clinical Faculty Leaders," assembled leaders of the academic, medical, and research communities to address issues surrounding the development, nurturing, and sustenance of physician-scientists. Participants included leaders of department chair organizations in dermatology, family medicine, internal medicine, neurology, pathology, pediatrics, physiatry, psychiatry, radiology, and surgery; deans of medical schools and associate deans for research; and directors of Clinical and Translational Science Award programs.

The goals of this forum were to: (1) encourage and prepare participants to be change agents in improving the development and retention of physician-scientists; and (2) encourage stakeholders from a variety of clinical disciplines to work collectively on a national agenda for revitalizing interest in physician-scientist careers. Through a series of presentations focusing on repairing the "leaking" pipeline, diversity and gender issues, mentoring, and overcoming organizational barriers, speakers and participants engaged in vigorous discussion about how institutions and other members within the academic, medical, and research communities have responded and can respond to solving the problem of recruiting and maintaining a robust clinical investigator workforce. This report focuses on the speakers' presentations, institutional innovations, and participants' conclusions and recommendations for implementing these solutions.

While the AAMC-APM forum is a step in establishing a cooperative effort to advance this agenda, much is left to accomplish. Maintaining an adequate supply of physician-scientists is imperative to the progress of biomedical research as well as improving and preserving the nation's health. Both AAMC and APM are committed to continuing these discussions with key stakeholders within the research community.

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APM Physician-Scientist Initiative

Anthony Mazzaschi
Interim Chief Scientific Officer
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Stabilizing the Physician-Scientist Pipeline

Mark Tykocinski, MD, Moderator
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Dr. Tykocinski is now Dean at Jefferson Medical College of Thomas Jefferson University.

Nancy J. Brown, MD
Associate Dean for Clinical and Translational Scientist Development
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Lawrence F. Brass, MD, PhD
Past President, National MD-PhD Directors Association
Past Chair, AAMC GREAT Section on MD-PhD Training
Director, Combined Degree and Physician Scholar Programs
University of Pennsylvania School of Medicine

Pamela B. Davis, MD, PhD
Dean and Vice President for Medical Affairs
Case Western Reserve University School of Medicine

Mark Tykocinski, MD introduced the session by proposing a set of core questions that dominate the discussion on the physician-scientist pipeline:

- How can we get more physician-scientists into the pipeline?
- How can institutions nurture, and promote the success of, physician-scientists already in the pipeline?
- What can NIH do to strengthen the physician-scientist pipeline?
- How effective have our physician-scientist-directed initiatives been to date?
- Should the community devise new output measures, both qualitative and quantitative, for evaluating physician-scientist outcomes?
- Should the community shift to from a trainee-centric perspective to taking a more employer-centric perspective when identifying success metrics?
- Should the community increase its focus on sustaining and prolonging the productivity of senior physician-scientists?
- Should the community not only cultivate physician-scientists but also engage physicians to participate in and promote research activities?

Lawrence "Skip" Brass, MD, PhD, presented the results of a study on career outcomes of MD-PhD program graduates over the last 50 years. Twenty-four programs supplied data on over 6,000 current MD-PhD trainees and alumni. Data were collected on program parameters, current students, recent graduates who are still in training and graduates who have completed training. Dr. Brass reported several emerging trends:

- Time to degree for MD-PhD program graduates has increased from 6.5 years in 1980 to 7.8 in 2007.
- Of those who completed training, over 80 percent have a position in academia, a research institute, or industry. Sixteen percent are in private practice.
- The majority of graduates, 68 percent, stay in academia. The percent of MD-PhD program graduates staying in academia is stable over time.
- The majority of graduates in academia indicate they are involved in basic,

The number of MD-PhD graduates choosing "traditional" research residency specialties (internal medicine, neurology, pathology, and pediatrics) is decreasing; whereas, those choosing surgery subspecialties, dermatology, ophthalmology, and radiation-oncology residencies are increasing.

translational, and/or clinical research. The time spent doing research varies considerably.

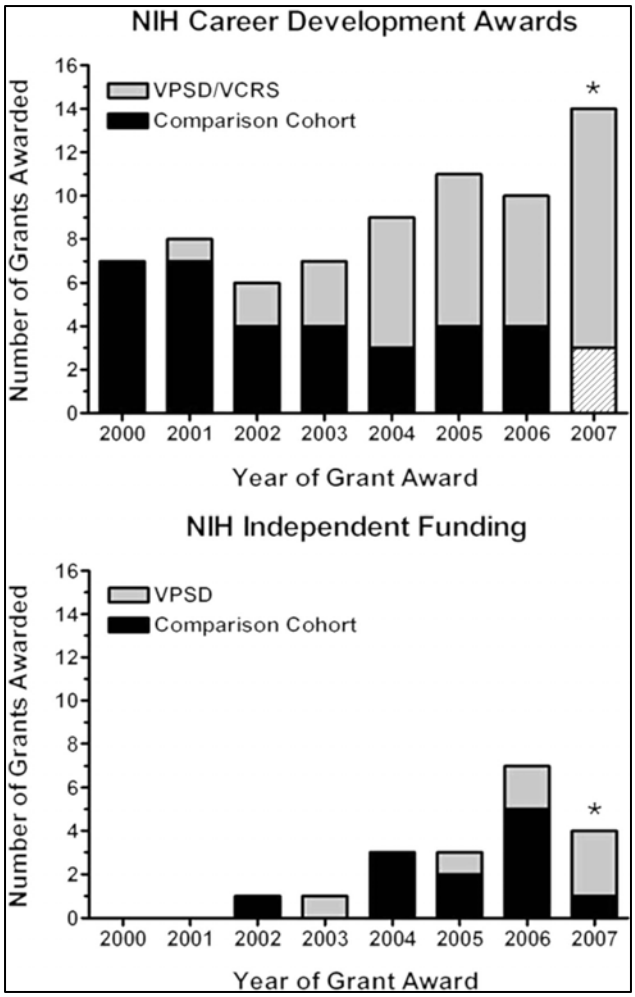
- The number of MD-PhD graduates choosing "traditional" research residency specialties (internal medicine, neurology, pathology, and pediatrics) is decreasing; whereas, those choosing surgery subspecialties, dermatology, ophthalmology, and radiation-oncology residencies are increasing.

Dr. Brass expressed his concern that future medical school graduates may become less likely to become physician-scientists than their predecessors, except for those students in MD-PhD programs. Medical schools and teaching hospitals must do a better job at encouraging inquiry and rewarding creativity. Dr. Brass concluded that while MD-PhD programs are meeting their goals, an ongoing system to evaluate programs and track graduates should be developed. Success in the past does not guarantee success in the future.

Nancy Brown, MD, presented data on the outcomes of physician-scientists who participated in the Vanderbilt Physician-Scientist Development (VPSD) program and the Vanderbilt Clinical and Translational Research Scholars (VCTRS) Program.

VPSD is an institutionally funded program that provides up to two years of salary support to new assistant professor physician-scientists who spend 75 percent of time conducting research under the supervision of an established NIH-funded Vanderbilt investigator. Candidates for the VPSD program are selected on a competitive basis and are regularly monitored by an advisory committee.

Dr. Brown noted that a key feature of the program is that the awardee works in the space of the mentor, recognizing that many fail in their application process because they seek to become independent too early. Every six months the advisory committee meets to evaluate the program participants,



* Data for 2007 through to September 30, 2007; striped bar indicates awards in 2007 to Vanderbilt physician–scientists not in the VPSD/VCRS programs and not included in the 2000–2006 comparison cohort. Before 2000, an average of three new career development awards were funded per year.

Source: Brown AM, Morrow JD, Limbird LE, Byrne DW, Gabbe SG, Balser JR, Brown NJ. Centralized oversight of physician-scientist faculty development at Vanderbilt: early outcomes. *Acad Med*. 2008 Oct;83(10):969-75.

ensuring they are on track, receiving protected time, etc. Participation in the second year is contingent upon evidence of

scientific progress; in particular, participants are expected to submit a K award at the end of their first year.

The VCTRS program was also designed to provide centralized oversight of mentorship, but participants may be selected in the last year of fellowship before appointment to the faculty. Participants must apply for external individual career development funding within two years and may receive up to three years of program funding. The outcomes of VPSD and VCTRS program participants were compared with those of Vanderbilt physician-scientists who received NIH career development funding without participating in either program. The majority of VPSD and VCTRS program participants achieved individual career award funding at a younger age. Vanderbilt has also created a Newman Society career development series for all K awardees to provide oversight and mentorship for developing physician-scientists.

Pamela Davis, MD, PhD, expressed disappointment that the current academic environment makes it difficult to cultivate new physician-scientists. There are many barriers for MDs contemplating entering into the research arena. NIH funding is flat, time to independence is long, physicians graduate with a high level of debt, and there is pressure for high clinical productivity. In addition, MDs feel competition from PhDs who have longer, more intense research training. Dr. Davis also noted that medical schools have a tendency to discourage physician-scientists. A paradigm has been created that medical students do not have research role models. Rather, clinical educators are seen as student role models.

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Despite this somewhat unfavorable environment, Dr. Davis stressed that it is an exciting time for research. Dr. Davis contrasted two models for training physician-scientists. In the first model, known as the "guppy model," many individuals are trained but few remain in the pipeline: they are often not fully funded, mentoring is variable, and didactics are often not coordinated, allowing the attrition of investigators. Individual K awards without some institutional umbrella can get lost in the shuffle and may not be multi-disciplinary. According to Dr. Davis, a model that only represents physicians may not represent where the future of research is going in the next few decades.

In the second model, the "mammal model," there are fewer scholars, mentoring is supervised, and didactics are coordinated. Selection of the best prospects is followed by intense and supervised nurturing. Corresponding with the funding of CTSAs, physician-scientist training at Case Western is increasingly following the second training model by establishing more formal physician-scientist training programs. Scholars are selected from multiple disciplines and are carefully nurtured and supervised. The didactics are considerable, including instruction in leadership, team-building, entrepreneurship, and communication. This creates a community and a critical mass. Mentoring is remunerated, but even the small dollar amount provided creates a sense of obligation. A team of mentors, including at

the very least a career mentor and a research mentor, assists the trainee.

The K to R conversion is expected of the scholars. Independent funding from other organizations such as the American Heart Association is also encouraged. While Dr. Davis was enthusiastic about Case Western's application of the mammal model, she noted that the relative outcomes of the mammal model vs. the guppy model are not yet proven.

Dr. Davis also pointed out the considerable institutional support required of this model. There is a large salary gap and there are research costs, mentor time, etc. to consider. According to Dr. Davis, about $500,000 of the program costs are financed by federal funding and $500,000 comes from the institution.

Promoting the Advancement and Minimizing the Attrition of Women and Underrepresented Minorities in Physician-Scientist Careers

Alan L. Schwartz, MD, PhD Moderator
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Barbara Alving, MD
Director
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Elizabeth Ofili, MD
Associate Dean for Clinical Research
Morehouse School of Medicine

Barbara Alving, MD, discussed challenges related to revitalizing the physician-scientist workforce at medical schools and teaching hospitals. She outlined the following goals of the CTSA program and the awardee institutions:

- Educate the next generation of clinical and translational researchers.
- Improve clinical research management through: informatics, communication with potential participants, and development of IRB reciprocity.
- Build diversity in leadership.
- Assemble interdisciplinary teams.
- Enhance public trust.
- Forge partnerships with private and public health care organizations.

An early analysis of CTSAs—based on 2008 annual progress reports from 24 institutions—demonstrates the shift toward multi-principal investigator, multidisciplinary studies. According to the report, there are 6,256 investigators and 513 trainees and scholars collaborating in basic and clinical research, as well as addressing issues related to public health, bioinformatics and allied health in the CTSAs (see figure). Dr. Alving alluded to the recent changes in the CTSA application to allow the recognition of more than one principal investigator (PI) on individual awards.

Dr. Alving reviewed the main points of the charge to the NIH Working Group for Women in Biomedical Research Careers to determine solutions to the gender gap in the sciences. She described the NIH Research Supplements to Promote Re-Entry into Biomedical and Behavioral Research Careers initiative. The program is designed to offer opportunities to women and men who have interrupted their research careers to care for children or parents or to attend to other family responsibilities. It facilitates mentorship and support to assist those scientists in reestablishing careers in biomedical, behavioral, clinical, or social science research.
Dr. Alving also discussed Research on Causal Factors and Interventions that Promote and Support the Careers of Women in Biomedical and Behavioral Science. The program will provide $2 to $3 million for up to eight R01 awards to support research on patterns observed in the careers of women in biomedical science and will assess the efficacy of programs designed to eliminate sex/gender disparities.

Lastly, Dr. Alving spoke briefly about the Deloitte LLP Women's Initiative (WIN) and the firm's high rate of retention for female employees. She concluded by emphasizing the need for collaboration among NIH, AAMC, APM, medical schools and teaching

Educational Impact of CTSA Program

(Based on 2008 Annual Progress Reports from first 24 CTSAs)

Field of Training	# of Investigators	# of Trainees and Scholars
Clinical Disciplines (Includes 37 subcategories)	3,948	272
Pediatric Disciplines	516	29
Public Health	317	50
Stats, Res Methods, Informatics	176	10
Genetics	134	9
Allied Health	121	16
Immunology	115	7
Nursing	110	20
Bioengineering	108	10
Neuroscience	108	18
Psychology, non-clinical	93	5
Physiology	77	5
Microbiology and Infect Diseases	69	8
Pharmacology	61	10
Molecular Biology	53	7
Other	250	37
Total	**6,256**	**513**

Source: Barbara Alving, MD. "The Challenge for Academic Health Centers: Revitalizing the Physician-Scientist Workforce. PowerPoint presentation. AAMC-APM Forum: The Physician-Scientist Workforce: A Workshop for Clinical Faculty Leaders. 31 Oct 2008.

hospitals, and other stakeholders to promote and ensure career success for women in biomedical research and academic medicine.

Elizabeth Ofili, MD, presented biomedical scientist career development models used at Morehouse School of Medicine, an institution with an 86 percent minority enrollment. The Morehouse Clinical Research and Career Development and Education Program is one program aiming to support underrepresented minorities in research careers. Managed by NCRR, the goals of the program are to establish and implement a curriculum in clinical research leading to the Master of Science in Clinical Research and to train junior faculty clinicians in the areas of health disparities. The program is also targeted at clinical investigators who will pursue clinical research on diseases that disproportionately impact minority populations.

She discussed the need for 3-5 years of close mentoring early in the researchers' careers and addressed issues of mid-career attrition due to promotion challenges and tenure restrictions. One of the most important components of this program is its mentorship model, which includes a team of a minimum of three mentors, including one lead mentor who is a part of the Morehouse faculty. However, through Morehouse's participation in the Clinical and Translational Science Award (CTSA) program with Emory University and Georgia Tech, a co-lead mentor may also be from one of these institutions.

Dr. Ofili also noted the AAMC Clinical Research Task Force recommendation to increase diversity and decrease attrition in the biomedical workforce as well as the success of the AAMC Professional Development Seminar for Early and Mid-Career Women Faculty.

Contemporary Approaches to Mentoring Physician-Scientists

John F. Greden, MD, Moderator
Rachel Upjohn Professor of Psychiatry and Clinical Neurosciences
University of Michigan Medical School

Eugene P. Orringer, MD
Director, MD-PhD Program
Executive Associate Dean of Faculty Affairs
University of North Carolina School of Medicine

Eugene P. Orringer, MD, discussed the mission and initiatives of the UNC Office of Research and Faculty Development (ORFD). This office seeks to support junior faculty, particularly those who are physician-scientists in the school of medicine, by preparing them for academic research oriented careers. The program has also supported a number of junior faculty from the four other schools on the health affairs campus.

Dr. Orringer outlined the process of establishing this office, beginning with writing an application for a K30 award to provide infrastructure support for the clinical research curriculum. The office supports training programs such as courses and seminars, work-in-progress presentations, meetings and mentoring panels—including scholars, mentors, and chairs. While most K30 awardee programs originally established a new degree-granting program (e.g. a masters in clinical research), the primary outcome of the UNC program for each scholar has always been a grant.

UNC next sought additional funding to support its junior faculty program through K12 awards. K12 awards are similar to T32 awards, but the primary target is members of the junior faculty rather than fellows. Most K12 funding was used to provide salary support for junior faculty in exchange for 75% FTE. Dr. Orringer described UNC's 3 successful K12 grants: the Building Interdisciplinary Research Careers in Women's Health (BIRCWH) K12, NCRR K12, and Roadmap K12.

While UNC's K12 programs are all very similar in their evolution, the BIRCWH program, the most mature of UNC's K12 awards, serves as a good model. Over the last eight years, the program has included junior faculty from across UNC's health affairs campus. There have been MDs, PhDs, MD-PhDs, PharmDs, etc. Of the 24 awardees, 22 are women and 2 are men. Eighteen of the 24 have graduated from the program and six remain enrolled. Of particular note, 19 of the program's participants remain on the faculty at UNC and five have been recruited away to other institutions. However, all 24 remain active in academe and each continues to pursue research in the area of women's health.

Of the 18 graduates of the BIRCWH program, all have active research support; 16 of the 18 have at least one NIH grant in their own name. The remaining two are funded by other organizations (i.e., American Heart Association and American Cancer Society), and both have an NIH grant pending. In addition, among the six current scholars, two have K23s pending, and one has an R03 award. Participants in the BIRCWH program are also funded by

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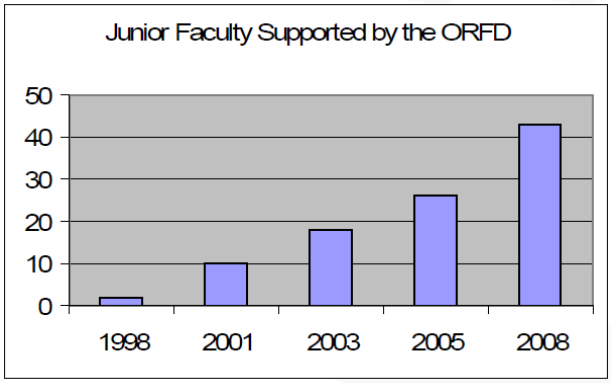
UNC Office of Faculty Research and Development



The figure shows the number of junior faculty supported by the five programs of ORFD: the three K12 grants, the Simmons Scholars Program, and the Program in Translational Science.

Source: Eugene P. Orringer, MD. "Contemporary Approaches to Mentoring Physician-Scientists. PowerPoint presentation. AAMC-APM Forum: The Physician-Scientist Workforce: A Workshop for Clinical Faculty Leaders. 31 Oct 2008.

various other foundation and industry awards.

In addition to these three separate K12 awards, the Office of Research and Faculty Development at UNC is responsible for the development and management of two state-funded faculty development programs: the Simmons Scholars Program and the Program in Translational Science.

The Simmons Scholars Program is used as a recruitment vehicle to recruit minority scholars to the UNC School of Medicine. All Simmons Scholars are expected to be visible and available role models for students, residents, and fellow, and each is expected to exhibit progress along an academic career path. Scholarly activity is monitored on a regular basis. Among the several unique features of this program are flexible spending dollars to fund scholarly activity and the creation of a "culture of community." Each approved candidate is provided three years of support at approximately $50,000/year. At the end of the three-year term, if progress is judged to be sufficient, the scholar can be awarded three additional years of support at $25,000/year.

Finally, Dr. Orringer also noted that the transition from K awards to R awards still remains a major challenge. With funding from the CTSA Program, UNC has created a "K to R Program." This novel program works with junior scientists, helping them to develop their own grants and to serve as peer reviewers for one another. It is the intention of the program that these individuals will become R-01 funded investigators and that they will serve as future mentors for the next generation of scholars.

Dr. Orringer concluded by stating that collaborative teams have proven themselves to be successful mentoring models and will remain critical to the future of biomedical research and training the next cohort of physician-scientists.

The Physician-Scientist Workforce Problems and Solutions

Fred Sanfilippo, MD, PhD
Executive Vice President for Health Affairs
Emory University

Fred Sanfilippo, MD, PhD discussed issues related to the physician-scientist workforce across the academic health center. In assessing the current state of affairs, Dr. Sanfilippo said that physician-scientist students and faculty are of increasing value in bridging the research and clinical enterprises.

The incentives for encouraging students to consider physician-scientist careers are decreasing and the disincentives are increasing. Powerful disincentives relate to the increasing misalignment between the academic and clinical environments, which makes support of physician-scientist students and faculty more difficult. Paradoxically, the misalignment in the academic and clinical enterprises increases the value of physician-scientists to bridge the gap, while at the same time making the gulf more difficult to traverse.

Special attention must be given to aligning the mission, vision, values, and goals throughout all components of the academic medical center.

Dr. Sanfilippo detailed some of the structural alignments issues within the academic medical center environment. Within medical school, there are alignment problems between the basic and clinical sciences and between the medical school and parent university. Within the teaching hospital environment, there are often alignment issues involving faculty and whether there is an open or closed staff model, and with the authority and accountability of service chiefs (often vis-à-vis department chairs). Chiefs and chairs are critically important to creating a proper training environment, and misaligned values create a toxic training and mentoring environment. Practice plan alignment issues relate to single versus group practices, open versus closed models, the leadership structure of the plans, and whether the plans are non-profits, limited liability corporations, or for-profits.

Some of the more important root causes of these functional alignment issues were also discussed. Culture, for example, is a critical factor and often involves whether institutions, leaders, and faculty have a medical school-centric perspective or a more holistic view. Various cultures often exist within medical schools and teaching hospitals, often focused on academic, business and professional service values.

The decision-making processes of institutions are also an important consideration, along with measures of success, reward systems, and how transparently resources are allocated. The mission, vision, and values of the organization are critical and can be shared (a partnership) or tolerated (often exhibited akin to a vendor-client relationship).

Dr. Sanfilippo discussed some of the manifestations of alignment or misalignment. Promotion and tenure issues are critical. He discussed how contributions to the academic and clinical enterprise can be segregated or considered additive. The additive approach tends to create incentives

for physician-scientists, whereas the division of activities into segregated buckets tends to be a disincentive. Related issues involve the flexibility of the tenure clock and the availability of various faculty tracks. The home base for faculty can be an issue, especially given local organizational structures. Lastly, Dr. Sanfilippo discussed various compensation and support issues, which create incentives and can affect vital support systems, including mentoring.

Dr. Sanfilippo concluded his remarks by discussing various options for improving the environment for physician-scientists, both to increase their numbers and provide nourishment for those in the pipeline. He urged that the diagnosis of alignment issues at individual academic medical centers be based on evidence, that any proposed interventions be subject to the scientific method, and that the outcomes be monitored and evaluated. Special attention must be given to aligning the mission, vision, values, and goals throughout all components of the academic medical center.

Forum Reflections and Next Steps to Address the Physician-Scientist Workforce Problem: Coalition Building, Organizational Planning

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Chief Scientific Officer
AAMC

Dr. Korn is now Vice Provost for Research at Harvard University.

Barbara Alving, MD, Commentator
Director
National Center for Research Resources
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Andrew I. Schafer, MD, Moderator
Principal Investigator
APM Physician-Scientist Initiative

During the concluding session, Barbara Alving, MD, David Korn, MD, and Andrew I. Schafer, MD, provided additional thoughts on the forum's presentations and discussion. Drs. Alving, Korn, and Schafer, along with many of the participants, drew these conclusions and posed the following questions:

- It is vital that physicians continue to participate in research
- Clinical research and translational research need better definitions. Translational research specifically needs to be understood as a two way street: bringing research from the bench to the bedside, and bringing observations from bedside to bench in order to elucidate mechanisms.
- Does a definition of a physician-scientist as one who devotes at least 75% of his or her time doing research discourage MDs from performing research?
- Coordinated research experiences from day one of medical school through junior faculty (such as the UCSF Pathways program) should be explored.
- Educators must engage students at a younger age to cultivate interest in various types of scientific investigation. A "Head Start" program at both the high school and college levels may foster interest in medical research careers. Other participants stated institutions must do a better job at creating science awards and prizes as a reward for student engagement—similar to the Howard Hughes Medical Institute model.
- A paradigm has developed where researchers are removed from a world where medical students are not exposed to them, preventing students from being attracted to academic research careers. While the pipeline can be improved for high school and college, a few participants noted that nothing discourages medical students from pursuing a career in research more than medical school. Several people stated that medical school graduates today see

Institutions should offer child and elder care and provide back-up day care in cases of work or weather emergency to improve trainees and young faculty retention and satisfaction. The cost effectiveness of such programs has been demonstrated by companies such as American Express, MasterCard, and Novartis.

their career role model as the clinician educator, not a top researcher. Having physician-scientists presenting grand rounds was one way proposed to expose "impressionable" medical students to research careers. It is even more difficult to sustain momentum during residency training. Current pathways and how they support physician scientist development must be evaluated.

- Physician scientists should not be seen to be in competition with PhD investigators, but rather both should be seen as working collaboratively and complementarily.
- The medical research community must be open to the possibility that the "late bloomer" model for developing physician scientists is no longer necessarily the most viable pathway and that we must look to earlier pathways.
- Research training should be inculcated in the medical school curriculum. Medical schools should strongly consider including individually mentored research experiences in the curriculum, not just didactic information about research.
- Department chairs along with research deans should share responsibilities for research training outcomes.
- Changing scientific competencies for physicians and researchers should be considered. Efforts in this regard are already in progress.
- Mentoring is critical. There should be formal training for mentors. Institutions should also assume oversight for mentoring, trainees, and for ensuring that protected time is provided.
- Compensation for mentoring should be provided.
- Fellowships have an especially important role but are often focused on early scientific training. Trainees often need to come out of fellowships to be able to compete for external funding.
- The biomedical research community must be open to changes in choice of career specialty. Many physicians are now entering fields that have not been traditionally homes to clinical investigators (dermatology, orthopedics, etc.). The community should reach out and be inclusive of these specialties, which could contribute more to clinical research in the future.
- NCRR should amend training grants applications requirements to reflect current trainees' needs and to allow trainees who, due to various family obligations, are employed less than full time, to compete for awards. Dr. Alving stated that NIH is committed to reexamining some of these policies with a "coordinated and thoughtful approach" through official structures at NIH such as an extramural working group.
- To better understand the career development dynamics and needs of woman and minority physician-scientists, metrics should be developed and data should be systematically collected to track the progress of graduate trainees and junior faculty.
- Institutions should offer child and elder care and provide back-up day care in cases of work or weather emergency to improve trainees and young faculty retention and satisfaction. The cost effectiveness of such programs has been demonstrated by companies such as American Express, MasterCard, and Novartis.

At the conclusion of the group discussion, it was noted that there is currently no continuous vehicle to push an agenda for physician-scientists development. It was the consensus of the participants that there should be some forum for continuing the

discussion of this meeting, and that some vehicle should be established for advancing an agenda for the issues addressed.

Participants suggested that a possible agenda might include:

- Sharing information and best (or effective) practices.
- Generating better data on training and career outcomes.
- Creating and funding pilot projects.

Participants also stated that it is critical to avoid fragmentation and duplication among organizations aligned to support clinical research. It was suggested that AAMC and APM reach out to organizations such as the Health Research Alliance, Clinical Research Forum, and American Physician Scientists Association, among others, to develop an "alliance" for physician-scientist training. AAMC and APM must also explore mechanisms for including non-medical school stakeholders in this discussion.

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