Physician-scientists have been recognized as an important piece for the advancement of medicine by being translators of medical research. Despite this recognized role, physician-scientists in the United States have decreased from 5% of all physician workforce in 1987 to 1.5% in 2014.

Why, in spite of their relevance, have physician-scientists become a rara avis in medical research? It is a complex matter, and I don’t expect to provide a universal answer in this short column. However, I hope to raise awareness of this subject from a trainee’s perspective by scrutinizing the hurdles that I (and some of my young colleagues) have to surpass during graduate medical education to become a physician-scientist in cardiovascular research.

I have decided to dissect the obstacles in the graduate medical education system, which in my experience, dampen the recruitment (and success) of young physician-scientists into trainee-related, program/institutional support and funding.

**Trainee Related**

a. Debt and salary: During informal discussions with my classmates, debt and salary has a great weight on their decision to not pursue further training. According to the Association of American Medical Colleges, 2015’s graduates from medical school had a mean debt of $180,723. Beyond the accumulated debt at the start of graduate medical education, another aspect that needs to be considered is the earning potential and actual earning of an early career physician. In a recent survey, 49% of early career cardiologists reported a reduction in potential earnings >$75,000 per year when accepting a position in academic medicine. It is hard to expect someone to invest more years in training beyond residency/fellowship or earn a fraction of the potential salary they could, without more incentives than love for science. I strongly believe that a scientist needs to be driven by passion. But when an individual has to think about supporting his or her family economically, the balance is likely to fall on economic safety. In our healthcare system, it is naive to think funding agencies will support research salaries as high as clinical duties provide. However, incentives such as debt forgiveness/assistance, early recruiting during training, and starting packages are of great help.

b. Belonging: This was the one I struggled with the most. I did not feel I belonged anywhere. My clinical colleagues assumed my experience in the lab was leisure time and some of the basic researchers thought I am in it simply to boost my curriculum vitae. Also, I had a hard time finding someone who had recently undergone through a similar experience from whom to get advice. I believe professional societies incentives can be of great value. Although the American Physician Scientists Association is available, more specifically to our field, networking events for physician-scientists in training during the early career programs of American Heart Association scientific sessions would be a great initiative to discuss our concerns/experiences.

c. Migratory status: For some non-American medical graduates, despite their interest in research, the constraints of visas which only allow a set amount of time to complete training makes them decide to focus on finalizing their clinical training above other interests.

**Program/Institutional Support**

a. Research during training: Protected time for research and its publication during training is associated with physicians being more likely to pursue a career in academic medicine. Although the American College of Cardiology Core Cardiovascular Training Statement (COCATS) stipulates dedicated time for research and scholarly activities, basic science research takes months to years to be completed. Unfortunately, not all programs offer enough protected time for fellows in training due to lack of funding or research culture.
b. Support system: Beyond allowing the trainee to have time for research, providing a structured training curriculum would help to overcome many obstacles to integrate research during training. Ideally, this curriculum should include regular meetings with mentors and progress evaluations, formal didactic seminars and coursework to provide training in required techniques and methods, as well as support to attend professional conferences to share their findings and gain new insight. Again, most programs will provide some level of support, but the variability in curriculum and encouragement between programs is appalling.

### Funding

a. American Heart Association: When applying for American Heart Association postdoctoral fellowships, physician-scientists in training are forced to compete against a growing number of PhDs. Physician-scientists have a natural disadvantage by the fact that time spent in clinical training and duties restricts the amount of preliminary data and participation in research projects that would provide support to their application.

b. National Institutes of Health/National Heart, Lung, and Blood Institute: Since funding priority scores of career development grants (K awards) are grouped together regardless the subcategories, physician-scientists are forced to compete against a growing number of established PhDs for them. A recent review of top reasons from National Institutes of Health Official for K-Grant failure is lack of appropriate preparation or commitment of the applicant or mentor and poorly designed career development plan and research proposal. All of these could be reduced with appropriate protected time and support systems as described above. However, more incentives to physician-scientists from National Institutes of Health would be welcomed.

I believe it can all be summarized by lack of recognition of physician-scientists as a pivotal figure in the advancement of medicine by policy makers, which results in lack of incentives, structured training programs, and funding for the physician-scientist figure.

With this column, I hope I had given a glimpse of the challenges current young physician-scientists confront and understand, at least in part, why their representation in the physician workforce has abated.

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### References

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