



Why Build a Kern Post-Doctoral Fellowship in Medical Education Transformation for “Basic” Scientists?

by Adina Kalet, MD, MPH

My grandmother, with her thick Eastern European accent, drove my uncle and me crazy. “Adina is the first ‘Doctor’ Kalet,” she would say, even though my uncle had a PhD in Engineering. He, in fact, had been the very first “Doctor” Kalet, but the family knew what she meant, right? /was the physician. Grandma loved both her son and granddaughter. But, to her, a PhD didn’t make you a “real” doctor. For her, it just wasn’t the same.

Those of us in medical education know, of course, that the education of physicians absolutely depends on basic scientists. Not only because scientists are the “transmitters” of an enormous fund of scientific knowledge to which physicians need access. They are critical because physicians need to experience – and engage with – how scientists *think* and what they *do*. For much of what physicians need to learn, scientists are both the content and process experts. Medical education research demonstrates that having scientists as teachers is critical both for practice and policy.

Still, my grandmother’s attitude reflects one of the traditional barriers to the seamless integration of basic scientists into the education of future physicians; she, as well as many students and faculty, seem to value the basic and clinical scientists differently.

This attitude stands in the way of optimizing how future physicians develop high quality clinical reasoning, since they must learn to integrate diverse basic, clinical, biopsychosocial, and contextual information, deeply and generously process these data, and then effectively perform the professional activities of

medicine (diagnosis, management, caring, accompaniment, counseling, etc.). Unless students understand and respect the value of *each* data source, there are many opportunities for error. A full integration of basic scientists into medical education is critical to developing these skills.

How has medical education tried to integrate foundational and clinical sciences?

Over the decades, different solutions have emerged. In 1910, Abraham Flexner made a compelling case for a science-based curriculum with the subsequently ubiquitous two years of “basic science” and two years of clinical rotations. He insisted that scientists teach the science.

Medical schools have tried different models to blend basic and clinical science teaching in order to achieve cognitive conceptual coherence. Implementation of best practices to integrate the basic and clinical sciences has lagged, especially when it relied heavily on “traditional,” passive teaching methods such as lectures, “binge and purge” assessments, and multiple-choice examinations. These approaches get students to briefly grasp large knowledge bases, but they do not achieve the level of integration we seek in our learners.

Over the last five decades, medical schools have made inroads integrating the clinical and basic sciences with case- and team-based learning curricula. Integration, however, has often been viewed largely as a matter of structure rather than as a means to honor the value of the basic science or to focus on individual learning outcomes.

In the end, the approaches have sometimes failed to improve clinical reasoning. We must move to the next level if we want to ensure that future physicians have the ability to accomplish these critical, complex cognitive tasks.

So, what is next?

Recently, cognitive scientists have argued for individualized, learner-centered, effortful, and assessment-driven strategies as the best road toward true integration. Students become more accurate diagnosticians if they experience basic science/clinical presentation “causal stories” rather than being given

evidence-based algorithms or basic science explanations separate from clinical material. This causal integration is not just a handy memory aid. By linking basic sciences with clinical features in a cause-and-effect relationship, learners build “illness scripts” or schema. Students create frameworks within their long-term memories that organize information to be retrieved when needed. This is learning.

Assessing whether students integrate basic science concepts in clinical situations is complex but possible. As medical educators, we should put our hearts and souls into designing experiences where our learners organize, conceptualize, retrieve, and then apply foundational medical sciences into the care of individual patients (and populations). Scientists and clinicians must understand and face the gap that has traditionally remained between them.

Creating a fellowship to equip basic scientists to be educational leaders

To address this gap and to chart a course forward, the Kern Institute will recruit basic scientists into a medical educator post-doctoral fellowship. The first cohort of one or two fellows will begin this fall. The goals of the program are to:

- Transform medical education by ensuring a steady pipeline of medical educator scientists ready, willing, and committed to implementing best practices in medical education.
- Build skills and confidence as the medical educator scientists integrate health science disciplines, design competency-based assessments, and collaborate with diverse stakeholders to train the next generation of health professionals.
- Create thought leaders as the medical educator scientists engage in curriculum reimagination and continuous quality improvement.

To achieve these goals, each fellow will:

- Work closely with, and support, MCW scientists and clinical educators to reimagine foundational science education in curriculum planning, instructional design, faculty development, assessment, and evaluation.

- Become master teachers of medical and other health professions students under the supervision of experienced mentors/coaches.
- Participate in medical school administrative leadership meetings as a means to understand academic medicine governance.
- Participate in the KINETIC3 faculty development program.
- Engage in scholarly work with the support of the Kern Institute's Medical Education Data Science, Human-Centered Design, and Philosophy Labs.
- Have financial support to do formal master's level, or equivalent, training in health professions education.
- Engage with national and international leaders in the field.
- Write and submit high-quality abstracts, peer-reviewed manuscripts, and grants.

As we developed this new fellowship, we reached out to the International Association for Medical Science Educators (IAMSE), an organization committed to “promoting excellence and innovation in teaching, student assessment, program evaluation, instructional technology, human simulation, and learner-centered education” and the Association for American Medical Colleges (AAMC). I personally sought advice from most of our basic science chairs, MCW basic science educators, deans, the provost, and members of our regional campus faculty. With this program, we are creating a clear path to deeply satisfying careers for trained scientists in medical education; we aim to prime-the-pump for future educational leaders.

I have other basic scientists in my family. My father's first cousin was a professor of pharmacology at a prestigious medical school, yet he complained bitterly about teaching medical students. As a basic scientist, he didn't feel appreciated. Being introverted, he didn't enjoy lecturing. He was convinced that most medical students weren't interested in discovering new treatments for diabetes and cancer. I wish there had been a way for him to better integrate into the medical curriculum and be appreciated for what he had to contribute.

I will think of my basic science relatives as we work with our fellows. I hope our fellowship graduates will bridge the gap between the basic and clinical science worlds in ways that assure basic scientists of their critical role in medical

education and show clinicians how much we depend on the scientists. Even my grandmother would have agreed with that goal.

Further reading:

Kulasegaram, Kulamakan Mahan; Martimianakis, Maria Athina, PhD;
Mylopoulos, Maria, PhD; Whitehead, Cynthia R., MD, PhD; Woods, Nicole N.,
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88 – Issue 10 – p 1578–1585 doi: 10.1097/ACM.0b013e3182a45def

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