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### One small step for the future

#### *Training future academic clinicians for multidisciplinary research teamwork*

By Bruce J. Baum and Frederick P. Ognibene

Increasingly, we hear that future science must take on a team approach (1), without classical, single-discipline academic silos. This future likely will involve public-private partnerships linking academia and industry with each other and the public sector (2, 3). A key to the formation of any successful multidisciplinary team is communication, including the appreciation for and understanding of each other's expertise. Through its new, yearlong **Medical Research Scholars Program**, the National Institutes of Health is trying to seed the fields of translational research by training one necessary segment of future biomedical science teams, health professional students, across the entire spectrum of research, from basic discovery to epidemiology and back. The overarching goal, in the spirit of the NIH Roadmap, is to help "advance science and enhance the health of the nation" (4).

Since its founding, the NIH has been committed to the training of future biomedical researchers and clinician-scientists. As a result, many American basic scientists received their Ph.D.s through NIH-sponsored training programs, as did many double-degree clinician-scientists. When one of us (Baum) completed his Ph.D. in biochemistry in the mid-1970s through such a training program, the future looked bright for an academic research career, and it was. However, right now the future seems uncertain for all stripes of young biomedical scientists. As Bob Dylan sang in 1964, "The times they are a changin'."

A major accelerator for change in biomedical

#### About the MRSP

- Medical, dental and veterinary students, who are U.S. citizens or permanent residents, are eligible to apply.
- Applications are accepted annually from Oct. 1 through Jan.15.
- The 2012 – 2013 student stipend is \$33,700 per year.
- Housing is available on or adjacent to the NIH campus.
- Health insurance is provided.
- Relocation expenses are provided.
- There is a student education fund for elective courses and conference attendance.
- A weekly dinner is held with NIH and university-based senior scientists.
- Each student has a dedicated senior NIH adviser.
- Mentored research occupies about 85 percent of students' time.
- Additional academic activities include
  - a) scientific lectures (basic to clinical),
  - b) a journal club focused on clinical research issues,

research occurred in 2003, when then-NIH Director **Elias Zerhouni** published a paper in the journal *Science* announcing the NIH Roadmap (5). Two of the three major themes described were “research teams of the future” and “reengineering the clinical research enterprise” (5). Since then, translational research and multidisciplinary science have become catchwords, while the country’s current economic woes have led to concerns about the financial support available for and the preeminence of American biomedical science (6, 7). Not surprisingly, the bidirectional research emphasis and economic challenges have sparked concern about career opportunities available for young scientists and students, whether they are focused on either the basic or clinical science ends of the biomedical research continuum (8, 9).

- c) patient rounds illustrative of translation from basic science to clinical protocol,
- d) training in academic leadership,
- e) Pfizer-provided training in the drug-development process and
- f) elective NIH graduate courses and lectures.

The MRSP evolved from two past highly successful yearlong intramural NIH training programs that ran in parallel: the Clinical Research Training Program, which existed for 15 years, and the Howard Hughes Medical Institute-NIH Research Scholars Program, which existed for more than 25 years. These two programs allowed more than 1,400 medical, dental and veterinary students to experience the spectrum of health-related science, albeit in a nonintegrated way. Impressively, the majority of alumni from these two programs, who have been tracked after completing all of their clinical training, are engaged in research. Both programs, however, ended with the close of the 2011 – 2012 academic year, and in their place emerged the MRSP, a single program in which student-scholars are exposed to all facets of biomedical research.

Importantly, the MRSP is also a public-private partnership, with financial support coming jointly from the NIH common fund (*i.e.*, the Roadmap initiative) and generous private-sector partners, particularly Pfizer Inc. and the Helmsley Charitable Trust. Our objective was to develop a dynamic training experience for the selected students, who typically participate between their third and fourth years of health professional school. The initial 2012 – 2013 MRSP class has enrolled 45 students, with an ultimate annual training capacity goal of about 70.

We think that by providing focused and rich opportunities for students to become engaged actively in research early in their clinical careers, we may help foster an appreciation of the entire process of scientific discovery.

Further, we anticipate that individuals trained in the context of team science

will recognize and be better prepared for the variety of long-term career pathways spanning the range of biomedical research. To achieve this goal, in addition to closely mentored research training, the MRSP provides an academic curriculum highlighting the diverse ways that scientific careers develop, training in human subjects research, and teaching rounds utilizing patients enrolled in NIH research protocols. Will this pedagogical experiment succeed? Only time will tell, but clearly traditional scientific training strategies must change.

The MRSP represents one small step in preparing individuals for a future in science quite different from the departmentally based and narrowly focused training most young scientists currently receive. While much of the outcry about multidisciplinary teams for translational research has focused on clinical scientists in training (9, 10), the need for new training models clearly exists across the research spectrum. The kinetics of successful translational research endeavors are bidirectional (5, 11) and so must be the training of America’s future translational research scientists.



**The Clinical Research Center | Photo courtesy of the National Institutes of Health**

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**Bruce J. Baum (bbaum@mail.nih.gov)** is the director of the Medical Research Scholars Program and formerly directed a bench-to-clinic gene-therapy program at the National Institutes of Health. **Frederick P. Ognibene (fognibene@cc.nih.gov)** is deputy director for educational affairs and strategic partnerships at the National Institutes of Health Clinical Center, the former director of the NIH Clinical Research Training Program and a former NIH senior investigator in the Clinical Center’s Critical Care Medicine Department.

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