

## **History of the National Institutes of Health Oxford/Cambridge Graduate Partnerships Program**

For decades, the intramural program of the National Institutes of Health, which is the largest biomedical research complex in the world, had no organized training program for doctoral students. In 1999, Dr. Harold Varmus, then Director of the National Institutes of Health, and Dr. Michael Gottesman, Deputy Director for Intramural Research, made a decision to establish a formal training process for doctoral students within intramural NIH. Effectively, this opened up research opportunities in over 1200 laboratories encompassing nearly every area of biomedical research. Program founders decided to undertake the development of new training programs as "partnerships" with research universities in order to promote inter-institutional collaboration and to ensure the students a world-class education by building on the success of existing programs. In 2000, the concept of NIH-UK partnerships was developed to address several key shortcomings in American graduate education in the biomedical sciences. Identified shortfalls in existing models of biomedical graduate education include:

- Excessive time to completion of a Ph.D. (7.8 yrs per a recent National Research Council study);
- Limitation of programs to a single University, department, or discipline;
- Inadequate preparation for the global nature of contemporary science, and
- Limited experience in collaborative research.

Chief among these problems is the long "time to degree completion," a phenomenon that has become institutionalized even at the best Universities. This has resulted in young scientists emerging to begin their independent research careers at the age of 35 or even later.

We envisioned that structuring an efficient training experience in global collaborative research would appeal to top students and provide a new prototype for future bioscience doctoral training programs. Among Universities around the world, Oxford and Cambridge offer special features in their long academic traditions, outstanding biomedical science and clinical schools, lack of a language barrier, and previously successful Scholarships for American students. We therefore created a doctoral program which enables exceptional students to pursue collaborative thesis research with a minimal amount of coursework or rotations and to complete their Ph.D. in three or four years. Each thesis project is co-mentored by at least two faculty members at Oxford or Cambridge and the NIH and involves laboratory research at both institutions. For its part, the NIH Division of Intramural Research established a partnerships program office (GPP) to attempt to provide an academic community with appropriate advising and support for doctoral trainees.

Over the past 7 years, the Scholarships have expanded to offer increasing opportunities to outstanding students to pursue biomedical research. At present, there are 90 Scholars carrying out research in approximately 50 different areas of biomedical research. In addition to the UK, our Scholars have carried out portions of their research in China, Germany, Australia, and Africa. Alliances have been established with the Rhodes Trust and the Marshall Aid Commemoration Commission to enable science students awarded their Scholarships to participate in the NIH-UK doctoral program. We also have sponsored Churchill, Gates, and Fulbright Scholars to earn full Ph.D.s in biomedical research. An annual Scholars-Mentors Colloquium was instituted to provide cross-fertilization between different researchers and disciplines. We have also recently established a framework for students to pursue combined M.D./ Ph.D. degrees.

The establishment of the International Biomedical Research Alliance in 2005 instituted a unique public-private partnership that has had a powerful impact on the Scholars program. The IBRA comprises a group of dedicated private citizens with the shared aim of training a new generation of top biomedical researchers better equipped to investigate human diseases and

develop new preventions, treatments, and cures. This talented group of individuals has been a source of ideas and support for the Scholars to complement the bench research with unique educational experiences. IBRA organizes and funds several major and minor events each year that bring the scholars and mentors together to interact and think about science. These include the annual Scholars-Mentors Colloquium, the Scholars Induction Dinner, the Outward Bound educational experience, the Scholars journal club, among others. They have also enlisted other prominent organizations in the education of the Scholars such as the Lasker foundation which, sponsored a four day "Lasker Lessons in Leadership" science training experience in England. The Aspen Institute, in collaboration with IBRA, sponsored Scholars to participate in its Health Research Forum providing interactions with leaders across the spectrum of biomedical research and health policy. These events promote the mission of the Scholarship to train outstanding biomedical researchers to have a "real world" impact on human disease.

As we contemplate the future, there are important requirements for success. The Scholars' program could benefit enormously from a stable long-term residence near the NIH campus, guaranteed travel funds, and laptop computers for research that may take them around the globe. At present, student funding depends on commitments from each of the NIH investigators who must devote resources from their own institutes/labs. If the program is to flourish, it will be important to develop a more stable centralized funding structure. The Scholars' research may be more effective in having an impact on human disease and suffering if these students are exposed to thoughtful leaders in disciplines such as law, policy, ethics, and commercial development. Those of us intimately familiar with these programs have been gratified by their rapid success, but recognize with humility that this effort will require continued thought, imagination, and support if we are to realize its full potential for humanity.

## **Key events in the development of the Scholarships**

- 1999 - Drs. Varmus and Gottesman institute intramural doctoral training at NIH.
- 2000 - Graduate Partnerships Program formed and Dr. Mary DeLong appointed Director.
- 2001 - NIH-Oxford University Scholars in Biomedical Research program inaugurated.
- 2002 - NIH-Cambridge University Health Science Scholars program inaugurated.
- 2002 - The first Scholars-Mentors Colloquium held at Keble College, Oxford University which has been held annually thereafter rotating between Oxford, Cambridge, and the NIH.
- 2003 - Advanced Scholar track initiated for UK students.
- 2004 - NIH-Marshall Scholarship affiliation permits U.S. Scholars at any UK university.
- 2004 - Scholars' residence is leased close to NIH through support by the Foundation for Advanced Education in the Sciences to facilitate exchange between U.S. and U.K.
- 2005 - NIH-Rhodes Scholarship Alliance sponsors Scholars from US and Commonwealth countries.
- 2005 - International Biomedical Research Alliance established by Ileana Rosenthal and Stephen McLean.
- 2006 - National M.D./Ph.D. Program initiated for combined M.D./Ph.D. candidates to enable Scholars to have basic and clinical training for research in conjunction with a large number of U.S. medical schools.
- 2007 - Creation of the *Global Impact Fund* by the British Embassy to promote the development of and collaboration between the U.S. and U.K. mentors.
- 2007 - Establishment of the NIH-Wellcome Trust program to admit United Kingdom and European Union students to carry out joint Ph.D. training between the NIH and UK.