

# Building a Better Researcher

When it comes to creating synergy between the bench and the bedside, Dr. David B. Roth, M.D., Ph.D., Chairman of Pathology, is passionate in his conviction that the twain not only shall meet, but must.

He believes that translational medicine—the translation of discoveries in basic science into the diagnosis, treatment, and prevention of disease—is the future of medicine.

But Dr. Roth is also acutely aware of the gulf separating clinicians fighting disease at the frontlines, and researchers studying basic biological processes behind the scenes. “Clinicians and scientists function in very separate worlds,” says Dr. Roth, the Irene Diamond Professor of Immunology in the Kimmel Center for Biology and Medicine of the Skirball Institute. “They have different cultures, different interests, and different ways of thinking.” Nevertheless, collaborations between the two are crucial, for both science and medicine.

Dr. Roth recently took an important step in the right direction by creating—along with his departmental colleagues Adrian Erlebacher, M.D., Ph.D., David E. Levy, Ph.D., Jonathan Melamed, M.D., and especially Cynthia A. Loomis, M.D., Ph.D.—a Graduate Training Program in Pathobiology in the School’s Department of Pathology. The program provides an integrated view of diseases and their causes, from the molecular and cellular level up to the individual patient. Students began to matriculate in July 2006.

Dr. Roth first began pondering how to bring the clinic and the lab together when he was co-director of a large interdisciplinary graduate program at the Baylor College of Medicine. “I realized how much the students can be the glue that brings faculty members together,” he says. “I saw a lot of successful

scientific collaborations start that way.”

The traditional venue for students interested in scientific research in a clinical setting is an M.D.-Ph.D. program. The programs train students to be physician-scientists. As Dr. Roth, a graduate of such a program, notes, “If you want to understand how the body works in health and disease, it doesn’t necessarily help you to take certain clinical rotations. Depending on your goal, some aspects of M.D.-Ph.D. training may be overkill.”

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Laura Danielson, a second-year graduate student studying sarcomagenesis and cancer stem cell theory, says she’s impressed by how the new Pathobiology program integrates research and medicine. “This past spring semester,” she explains, “the Pathobiology students took the Medical Immunology course—right alongside the med students—and then we all discussed research articles. The extent to which the program combines medical knowledge and critical thinking is truly



unique, and it certainly helps guide us in the way we approach the big picture.”

“I want the Pathobiology program to teach integration,” says Dr. Roth. In that spirit, students are required to have both a primary science mentor and a co-mentor from the program’s clinical faculty, and are encouraged to develop a clinical focus in their research projects—say, understanding the pathogenesis of breast cancer or lymphoma from both the basic biology and the clinical perspectives. Dual mentoring, explains Dr. Roth, not only maintains an integrated outlook, but it also brings the co-mentors together.

In addition to producing a crop of superb translational scientists, Dr. Roth expects the Pathobiology program to have a positive impact on his entire department. “Insight into basic mechanisms can impact the way a physician thinks about a disease,” he says. “Conversely, a broader knowledge of pathobiology can empower one’s science. You can never think about a cancer in the same way once you’ve actually seen a patient—or evaluated a patient’s specimen. It changes you.” ●