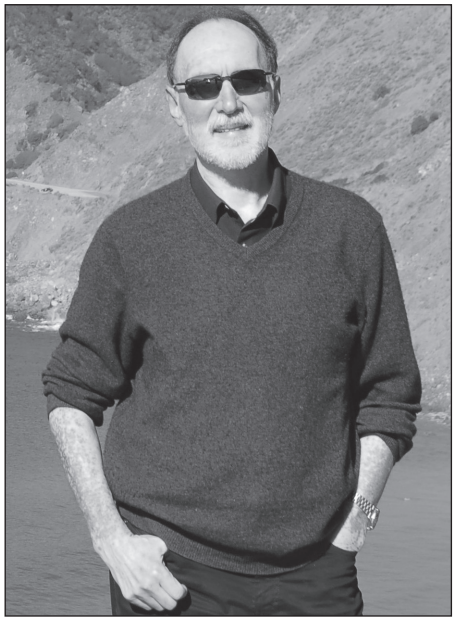
PHARMACEUTICAL VETERAN RICHARD HORUK TEACHES INSIGHTS ABOUT DRUG DEVELOPMENT

Biochemist Richard Horuk, a veteran of more than two decades as a commercial pharmaceutical research and development scientist, is intent on improving medical students' grasp of vitally important material that many of them have difficulty understanding.

Horuk's experiences with drug development are rich and varied, encompassing directing research teams. His appreciation of pharmaceutical research is deeply personal. For years he has lived with a potentially lethal condition, Wegener's granulomatosis, an inflammation of the upper and lower respiratory tracts accompanied by necrotizing vasculitis. A monoclonal antibody drug called Rituxan has helped suppress the disease.

"I am a patient who probably would have died without this drug, but the work that Genentech did in developing that drug has saved my life," Horuk said. That is the passion that he brings to his teaching at UC Davis, which he began in 2007.

"Pharmacology is central to most of medicine, but many students have told me that they haven't always found it to be the easiest subject to master because of all the information they must learn about chemical structures. Most medical students have a strong biological background, but in many cases do not have a strong chemical point of view. Instructors need to show relevance and why this information is important for them to know. If you can interest students in wanting to learn it, they'll probably understand it," said Horuk, a UC Davis volunteer clinical faculty member who leads discussions about glucocorticoids and drugs for multiple sclerosis, and who helped design a course – Pharmacology (PHA) 207, Drug Discovery and Development – that he co-teaches with Michael Rogawski, professor of neurology, and Heike Wulff, professor of pharmacology. Horuk believes that physicians benefit most from chemistry instruction that focuses not as much on formulas and structures as it does on the relevance of chemistry to everyday life.



Richard Horuk (courtesy photo)

"This is a graduate-level course that includes students in the Pharmacology and Toxicology Graduate Group and the Department of Chemistry," Rogawski said. "Richard lectures on the process by which new drug molecules are identified and optimized so that they are best suited to treat patients safely and effectively."

Wulff added, "PHA 207 also often attracts students from the CTSC training grants and junior clinical faculty who are interested in drug development. Dr. Horuk's industry experience is invaluable for this class, since he can tell students about industry practices from first-hand experience."

The course examines the process by which a drug is discovered, developed and released for public consumption. The content encompasses formulation, safety testing, clinical evaluation, regulatory issues, and intellectual property considerations.

Horuk's academic credentials are impressive. He earned his Ph.D. in 1980 at Birkbeck College at the University of London, with Sir Thomas Blundell as his principal adviser. (Blundell was part of Dorothy Hodgkin's research team who won the Nobel Prize in chemistry in 1964 for solving the structure of vitamin B12.) Horuk subsequently worked as a postgraduate researcher at the National Institutes of Health in Bethesda, Maryland, under the mentorship of future Nobel Laureate Martin Rodbell.

After joining the UC San Diego faculty in the mid-1980s as an assistant professor investigating pathways involved in insulin action, Horuk worked in drug development not only at DuPont Merck (for which he was a principal investigator in immunology, 1986–91) but also at Genentech (senior scientist in protein chemistry, 1991–94) and Berlex Biosciences (scientific director of immunology research, 1994–2007).

Horuk is most renowned and respected for his expertise in chemokine receptors, particularly with respect to malaria. "These are proteins that coordinate an immune response," he explained. "I discovered that a protein in the red blood cells is involved in a particular form of malaria." Horuk's findings eventually could lead to development of small molecule inhibitors with the potential to effectively suppress malaria. But scientists are looking down a long, costly, uncertain path.

"I tell students that pharmaceutical researchers must be realistic about the long odds for success – that out of every 100 drugs or 100 projects that a pharmaceutical company has in its pipeline, one of them might make it all the way as a registered drug. There's a high price for failure, and researchers and pharmaceutical companies must be prepared and able to tolerate a lot of that," Horuk said. "But if you work on a drug that actually does make it all the way through and it is registered, it's just absolutely fabulous."