

Research symposium explores cutting-edge medical science “beyond the genome”

The science of proteomics is so new there wasn't even a word for it until 1994, when a grad student in Australia coined it for his Ph.D. thesis on rapidly identifying protein.

He used the word, a combination of “protein” and “genomics,” at a scientific conference in Italy, and it stuck. Today, proteomics—the study of proteins and their production, function, and interaction—is an emerging field of study that is having a major impact on medical research.

“Proteomics is the next big step in medical research. Some of us believe it's the ultimate gateway to understanding the cause, diagnosis, and treatment of disease.”

To understand biological processes, scientists need to understand how proteins function. The sequencing of the estimated 35,000 genes in the human genome was only the beginning. Each of those genes can code for at least 10 times as many proteins, and in extreme cases a single gene can code for more than 1,000. In addition, protein activity affects an organism directly, whereas genes have an impact only through the proteins they encode.

“Studying all the proteins in a cell and how they interact and function in the body tells us much more than simply looking at the genome,” said David Cool, Ph.D., associate professor of pharmacology and toxicology.

“Proteomics is the next big step in medical research,” Cool said. “Some of us believe it's the ultimate gateway to understanding the cause, diagnosis, and treatment of disease.”

Last fall more than 80 scientists, researchers, and students from across the nation came to Wright State for a research symposium in this promising new field hosted by the Department of Pharmacology and Toxicology. The “Proteomics in Modern Medicine” symposium featured keynote speaker and Earl Morris Endowed Lecturer, Richard Caprioli, Ph.D., who is the Stanley Cohen Professor of Biochemistry and director of the Mass Spectrometry Research Center at Vanderbilt University. Caprioli is an internationally recognized, award-winning researcher whose groundbreaking work has greatly advanced the field of proteomics.

“Dr. Caprioli has developed, even beyond my wildest dreams, the ability to take tissue sections and determine what proteins and peptides are there,” Cool said. “This is a huge development in the field. It lets a doctor take a biopsy from tissue and scan it in a new way.”

The symposium also marked the official opening of Wright State's Proteome Analysis Laboratory (PAL), a state-of-the-art new research facility within the pharmacology and toxicology department that features highly specialized equipment devoted to proteomics.



Richard Caprioli, Ph.D., delivers the Earl Morris Endowed Lecture during the “Proteomics in Modern Medicine” research symposium.

The PAL will allow university scientists and research partners throughout the region to apply processes such as those pioneered by Caprioli.

“The equipment allows greater detail and accuracy,” Cool said, “in that we're looking more precisely at a broader range of peptides and chemicals in very defined regions of tissues and organs.”

The symposium also featured presentations by Cool and Kenneth Greis, Ph.D., associate professor of cancer and cell biology with the University of Cincinnati and director of proteomics and mass spectrometry for the university's Genome Research Institute. **VS**