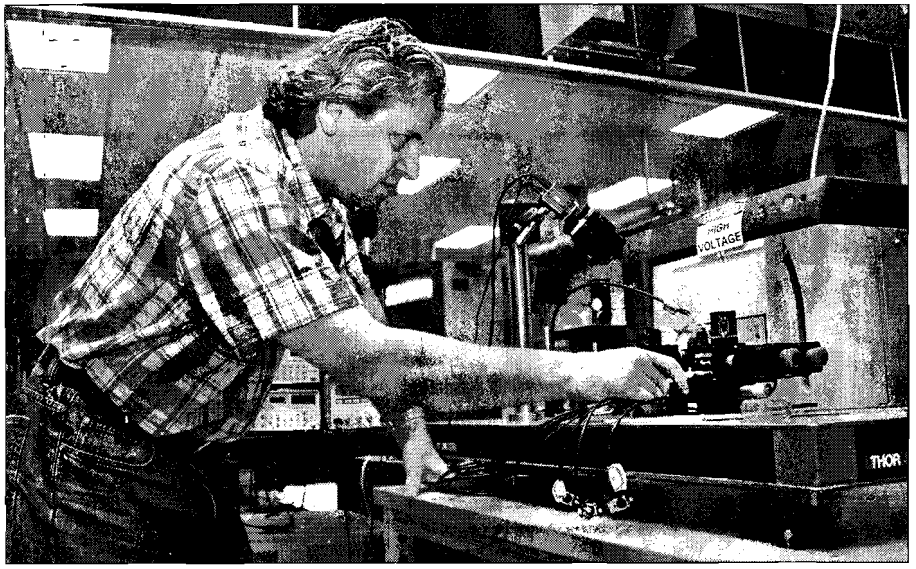
Professor helps develop genome microscope



Jon Birk/Hatchet photographer

Professor Akos Vertes is helping to design a microscope to research proteins.

by Reed Cooley
Hatchet Staff Writer

As a young boy, Akos Vertes was hooked on science.

An elementary school classmate in communist Hungary told him that hydrochloric acid could dissolve iron. This simple experiment began a lifelong passion for scientific learning. Today Vertes is working on a slightly larger experiment – one that may revolutionize the way scientists study and treat diseases.

Vertes, the Deputy Chair of the Department of Chemistry and Chemistry, Biochemistry and Molecular Biology professor, is also the co-director of the GW Institute for Proteomics Technologies and Applications.

The Institute is a part of the Chemistry Department and in its second year of a $1.5 million grant from the W.M. Keck Foundation. The grant funds the development of a protein microscope, a device that will help scientists gain a better understanding of human biochemistry by examining tiny organic compounds.

The bulk of Vertes' research can be found in Corcoran Hall in a lab few chemistry students will ever see. A handful of busy graduate students sit at computers manipulating spreadsheets and recording data. Several large machines including two mass spectrometers – key components of the protein microscope, which measures the mass and charge of tiny ions – surround them.

Proteomics, Vertes said, in a basic sense is the study of an organism's genome. The human body has about 35,000 genes that carry information essential to a human's physical and mental development. The genes hold the information, and proteins trigger development outlined by the genes, he said.

Since the mid-1980s, scientists have been developing better ways to study these tiny particles. Today, Vertes continues the work and hopes to capture an entire charged virus in a mass spectrometer.

The focus of the institute's work is to further develop the technology and create a new microscope. The instrument Vertes is working on with physics professor Mark Reeves displays a sample of matter using a small light source. The result of the project will be a protein microscope, which Vertes said will significantly advance the field of proteomics.

The development would allow scientists to map and carefully examine proteins, Vertes said. Practical applications of this examination will include a better understanding of neuromuscular junction – the connection between the brain and the functions of the

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body. This could allow doctors to partially repair paralysis and would be helpful in treating ALS and Lou Gehrig's disease.

The Institute also has a department dedicated to applications. Professor Fatah Kashanchi is researching possible applications to treating HIV. With the microscope, he will be able to examine what happens to cells when afflicted by the virus. The microscope might also be helpful in diagnosing breast cancer before it is fully manifested, Vertes said.

Vertes first worked extensively with mass spectrometers in the early 1980s in Hungary where he was born, raised and educated. He has also worked at Notre Dame University and the University of Antwerp before he came to GW in 1991.

Before his career in higher education, he was raised under communist rule in Budapest.

"We tend to look at (life under communism), as something gloomy and drab," he said. "It really wasn't."

Vertes is the first scientist in his immediate family. He will not, however, be the last. His oldest son has just finished medical school in Brussels, and his other son has just begun work on a doctorate in Physics at Cambridge University in England. ■

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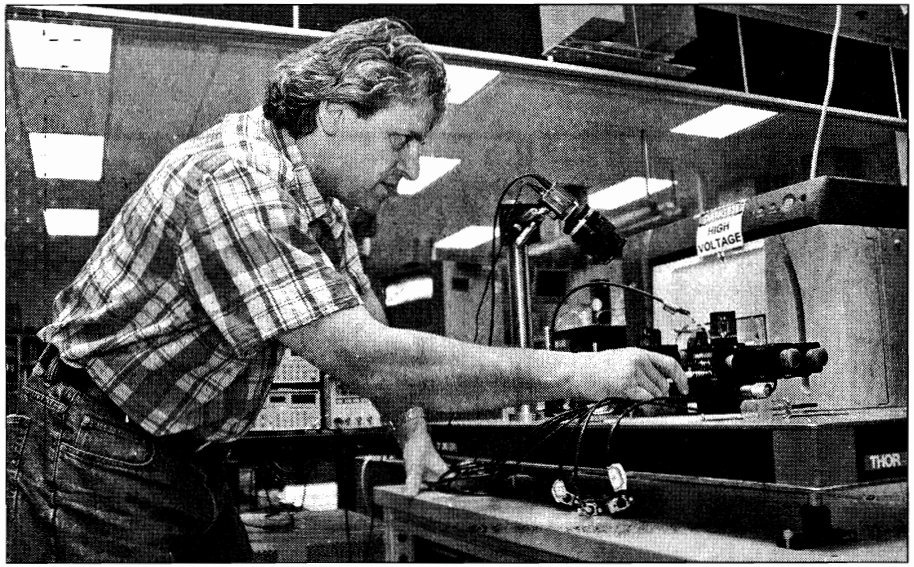

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