Five members of UCSD faculty elected to National Academy of Sciences

April 30, 1996

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Five members of the faculty of the University of California, San Diego have been elected this year to the prestigious National Academy of Sciences.

\par The five are: Maarten J. Chrispeels, professor of biology; Charles S. Cox, professor emeritus of oceanography at the Scripps Institution of Oceanography; K.C. Nicolaou, professor of chemistry and biochemistry; Susan Taylor, professor of chemistry and biochemistry and a senior fellow at the San Diego Supercomputer Center; and Andrew J. Viterbi, professor emeritus of electrical engineering and computer sciences (ECE) in the School of Engineering.

Members are elected in recognition of their distinguished achievements in original research. Including this year's election, 59 members of the UCSD faculty are now part of the organization.

Chrispeels, a plant biologist who came to UCSD in 1967, has been working to create pest- resistant plant seeds. In recent work, he led a team of researchers who conferred insect resistance to peas using a gene transplanted from the common kidney bean. It was the first time that seeds had been made resistant to insects.

Currently, he is working to create genetically engineered insect-resistant seeds for cowpeas, blackeyed peas, chickpeas and mungbeans--important sources of protein in developing nations in Africa, Asia and South America.

\par Since graduating from the Scripps Institution of Oceanography in 1954, Cox has been studying oceanic electromagnetic fields and small-scale ocean structures. His research has focused on measuring fine-scale fluctuations in temperature and salinity within the ocean waters as an indicator of sea turbulence. To accomplish this goal, Cox has developed free-fall instruments to make these measurements possible. He also has studied the electrical conductivity of the earth below the sea by measuring the penetration of electromagnetic fields into the seafloor.

Nicolaou, a world renowned organic chemist at UCSD and the Scripps Research Institute, is currently pursuing the development of new synthetic technologies and strategies, and the total synthesis of natural products and designed molecules.

Most of Nicolaou's efforts is focused on the understanding of natural products with potential medical applications. Among the chemicals he's studied are calicheamicin, a compound first extracted from bacteria in rocks that is active against cancer; and rapamycin, found in bacteria from Easter Island, which may be useful in preventing rejection seen in organ transplants.

His lab also has worked out a synthesis for taxol, reducing the need to strip the bark of the Pacific yew tree for this anti-cancer substance; and his group has designed a water-soluble, less toxic version of taxol that is now being developed by a pharmaceutical company.

For the past several years, Taylor's lab has been studying an important family of regulatory enzymes called protein kinases. In living systems, processes including cell growth and division, tissue differentiation in embryos, memory and thought, and most of the complex instructions for cellular changes from birth to death are regulated by this family of enzymes.

Faulty regulation of kinases has been linked to several diseases, including immunodeficiency diseases, diabetes, cancers, Alzheimer's disease, Lou Gehrig's disease and myotonic dystrophy.

In 1991, a team of researchers led by Taylor--co-director of the Computational Center for Macromolecular Structure--solved and published the three-dimensional structure of a member of the kinase family. Since then, the structure has been used as a template to solve and model the structures of other kinase molecules.

In recent research, Taylor described fundamental steps in the path along which kinases are activated, targeted to some part of the cell, and deactivated. The findings offer research avenues toward the rational design of drugs capable of regulating this intricate signaling system.

In 1968, Viterbi and UCSD engineering professor Irwin Jacobs formed a part-time consulting firm called Linkabit, a company that ultimately became the foundation for most of San Diego's telecommunications industry.

Among the firms spawned by Linkabit and some of its former executives are Sciteq Electronics, Inc., Comstream Corp., PCSI, ViaSat, Primary Access Corp., Torrey Science & Technology, Titan Corp., VideoCipher, and MCSI.

Perhaps the most successful of these was QUALCOMM Incorporated, founded in 1985 by Jacobs and Viterbi to commercialize digital telecommunications. Today, Viterbi is vice chairman and chief technical officer of QUALCOMM. The company sells a two-way satellite message and tracking system called OmniTRACS used by trucking companies to keep watch over their fleet; and products based its digital technology called Code Division Multiple Access (CDMA) for digital, cellular and personal communications systems.

Viterbi is a member of the National Academy of Engineering, a Fellow of the Institute of Electrical and Electronic Engineers (IEEE), and a winner of the Alexander Graham Bell Award from the IEEE.

Also elected this year to the academy is Zachary Fisk, a former physics professor at UCSD who recently moved to Florida State University.

The National Academy of Sciences was established in 1863 by a congressional act of incorporation, signed by Abraham Lincoln. The organization was set up to act as an official adviser to the Federal Government in any matter of science or technology.

(April 30, 1996)