Stamp Vignette on Medical Science

Stanley Cohen—Nobel Laureate for Growth Factor

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Stanley Cohen, American biochemist and zoologist, and Rita Levi-Montalcini (1909-) shared the 1986 Nobel Prize for medicine or physiology for their work on growth factors, discoveries of fundamental importance to the understanding of the mechanisms regulating cell and organ growth. Cohen and Levi-Montalcini identified a growth factor that controls the growth of cells in the nervous system (nerve growth factor or NGF). Later, Cohen discovered a second growth factor, epidermal growth factor (EGF). He purified and sequenced EGF and studied its binding to receptors on the surfaces of cells. Cohen's work provided insight into the hormonal regulation of cell growth and division and helped to explain the growth of cancer cells as well as normal cells and tissues. His work had a major role in the subsequent discovery (by others) of previously unknown growth factors.

Cohen was 1 of 4 children of an immigrant tailor from Russia. He was born on November 17, 1922, in Brooklyn, NY. As a child, he contracted poliomyelitis, which left him with a permanent limp. Cohen attended James Madison High School in Brooklyn, where he developed a lasting interest in and devotion to science and classical music. After graduating from high school, he attended Brooklyn College and obtained a BA degree with majors in zoology and chemistry in 1943. He received a scholarship to Oberlin College in Oberlin, Ohio, where he earned an MA degree in zoology in 1945. He continued his graduate work at the University of Michigan in Ann Arbor, working as a teaching fellow in biochemistry. In 1948, he received his PhD degree with a dissertation on metabolic function in the earthworm.

For the next 4 years, Cohen worked in the departments of radiology and pediatrics at the University of Colorado School of Medicine in Denver, where he and his colleagues conducted research on the metabolism of creatinine (a substance found in urine, muscle tissue, and blood) in premature and newborn infants. In 1952, he left Denver to become an American Cancer Society postdoctoral fellow at Washington University in St Louis, Mo. He was assigned to the radiology department the first year and then became an associate professor in the zoology department, where he worked for 6 years. While in St Louis, he continued his research on the biochemistry of growth processes and made his first major contribution in that field.

At Washington University, Cohen joined Levi-Montalcini as a researcher. He helped isolate NGF, a natural substance that Levi-Montalcini had found. Later, he identified another cell growth factor in the chemical extracts that contained NGF. Cohen discovered that this substance caused the eyes of newborn mice to open and their teeth to erupt several days sooner than normal. He called the substance "epidermal growth factor" and eventually purified it and analyzed its chemical structure. Cohen found that EGF influences a great range of developmental events in the body. He also discovered the mechanism by which EGF is taken into individual cells and acts on them. Cohen's findings were extremely important to the field of neurobiology because they provided a well-defined chemical agent for stimulating nerve cell growth and another to inhibit its activity. NGF promises to have therapeutic value in the repair of nerve tissue, and EGF, shown to stimulate the healing of wounds in the skin and corneas of animals, may improve the effectiveness of skin transplantation.

Cohen continued his research at Washington University until 1959, when he moved to Vanderbilt University in Nashville, Tenn. At Vanderbilt University, he resumed his research on growth factors and was promoted to full professor of biochemistry in 1967. In 1976, he became an American Cancer Society research professor of biochemistry.

In addition to the Nobel Prize, Cohen has been awarded many honors and medals from throughout the world. He was honored on a stamp issued by Uganda in 1995. The stamp is part of a sheet of 16 stamps that honor individual Nobel laureates.

