

Stamp Vignette on Medical Science



Ragnar Granit—Nobel Laureate in Medicine

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Finnish-born Swedish physiologist Ragnar Arthur Granit shared the 1967 Nobel Prize for physiology or medicine with two American scientists, George Wald (1906-1997) and Haldan K. Hartline (1903-1983). They received the award “for their discoveries concerning the primary physiological and chemical visual processes in the eye.” Specifically, Granit analyzed the external electrical changes that occur when the eye is exposed to light. He proposed a “dominator-modulator” theory of color vision—that is, that the eye contains three kinds of photosensitive cone cells, each of which responds to a different portion of the light spectrum. Some optic nerve fibers (“dominators”) are sensitive to the whole spectrum, whereas others (“modulators”) respond to a narrow band of light wavelength and, thus, are color-specific. Biochemical proof of Granit’s theory of the spectral sensitivities of the three types of cone cells (blue, green, and red) was provided in the 1950s when Wald isolated the three cone pigments.

Granit was born of Swedish parents on Oct. 30, 1900, in Helsinki, Finland. Because his father was a forester for the Finnish government, Granit was reared in Helsinki and attended the Swedish Normallyceum there. In 1919, he entered the University of Helsinki, where he earned an M.S. degree in experimental physiology in 1923 and his M.D. degree in 1927. In 1928, he was awarded a research fellowship at Oxford University (England), where he worked

with two famous English physiologists, Edgar D. Adrian (1889-1977) and Sir Charles Sherrington (1857-1952). From 1929 to 1931, Granit conducted research on vision as a fellow in medical physics at the University of Pennsylvania, where he met Wald and Hartline.

In 1931, Granit was a Rockefeller Foundation fellow at Oxford University and worked again with Sherrington. In 1933, he returned to Finland to teach physiology and do research at the University of Helsinki, where he became professor of physiology in 1935. His work at the university was interrupted when the Soviet Union invaded Finland in 1939. Granit served as a physician on the island of Korpo in the Baltic Sea and also served at two other nearby islands on which the Swedish language was spoken.

In 1940, Granit became a naturalized Swedish citizen and accepted the post of professor of neurophysiology at the Royal Karolinska Institute in Stockholm. He became director of the Nobel Institute of Neurophysiology in 1945, a position he held until his retirement in 1976. From 1956 to 1976, he also served as a visiting professor or researcher at numerous institutions throughout the world.

In the early 1930s, Granit was the first person to observe inhibition in the retina of the eye. His book entitled *Sensory Mechanisms of the Retina* (1947) became a classic work in the field of retinal electrophysiology. He used electrophysiologic methods to demonstrate the presence of three kinds of color receptor elements in the retina and to show the importance of inhibition among nerve cells in retinal function and in the nervous system in general. Granit also studied muscle receptors, and through these studies, he helped explain how the gamma motor system coordinates muscle action.

Granit died on Mar. 12, 1991, at the age of 90 years. He was honored on a stamp issued by Sweden in 1996. The stamp is one in a set of four stamps honoring Nobel laureates; the other honorees are Hugo Theorell (1903-1982), Sune Bergström (1916-), and Bengt Samuelsson (1934-). Granit was also honored on a stamp issued by his native Finland in 1989.