

## Stanley Cohen (1922- ) <sup>[1]</sup>

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[Stanley Cohen](#) <sup>[5]</sup> is a biochemist who participated in the discovery of [nerve growth factor](#) <sup>[6]</sup> (NGF) and epidermal growth factor (EGF). He shared the 1986 [Nobel Prize in Physiology or Medicine](#) <sup>[7]</sup> with [Rita Levi-Montalcini](#) <sup>[8]</sup> for their work on the discovery of growth factors. His work led to the discovery of many other growth factors and their roles in development.

[Stanley Cohen](#) <sup>[5]</sup> was born on 17 November 1922 in Brooklyn, New York. His father was a tailor and his mother a housewife who immigrated to the United States from Russia in the early 1900s. Cohen spent his early education in the New York City public school system, and attended the city college, [Brooklyn College](#) <sup>[9]</sup>, for his undergraduate studies. [Brooklyn College](#) <sup>[9]</sup> had no tuition, which allowed him the opportunity to attend the school. He majored in Biology and Chemistry and earned a bachelor's degree in 1943.

To save money for graduate school he worked as a bacteriologist in a milk processing plant. Cohen earned an MA in zoology from [Oberlin College](#) <sup>[10]</sup> in 1945. In 1948 he earned a PhD from the [University of Michigan](#) <sup>[11]</sup> for [earthworm](#) <sup>[12]</sup> research. Cohen studied the metabolic mechanism for the change in production from ammonia to urea during times of starvation. He collected more than 5000 [worms](#) <sup>[13]</sup> from his campus for his research. After earning a PhD, Cohen worked in pediatrics and biochemistry at the [University of Colorado](#) <sup>[14]</sup> under Harry Gordon. He studied metabolism in premature infants. In 1952 Cohen joined the [Washington University](#) <sup>[15]</sup> Department of Radiology as a postdoctoral fellow of the American Cancer Society under Martin Kamen. At [Washington University](#) <sup>[15]</sup> Cohen noted his participation in the journal club with Arthur Kornberg as a priceless experience.

In 1953 Cohen joined the zoology department to work with [Viktor Hamburger](#) <sup>[16]</sup> and [Rita Levi-Montalcini](#) <sup>[8]</sup>. His first project was to isolate [nerve growth factor](#) <sup>[6]</sup> from sarcoma 180—a tumor which causes extreme nerve growth in spinal and sympathetic ganglia of the [chick](#) <sup>[17]</sup>. In characterizing the isolate, Cohen used [snake](#) <sup>[18]</sup> venom to test the characteristics of the [nerve growth factor](#) <sup>[6]</sup>, but instead discovered that [snake](#) <sup>[18]</sup> venom included large amounts of growth factor. Further experimentation showed the [nerve growth factor](#) <sup>[6]</sup> to be present in [mouse](#) <sup>[19]</sup> salivary glands. These salivary glands contained much more NGF than any known tissue, which allowed Cohen to purify them in significant amounts. He used [mouse](#) <sup>[19]</sup> salivary glands to determine the molecular weight of [nerve growth factor](#) <sup>[6]</sup> in 1960. Cohen played an active role in the later characterization of [nerve growth factor](#) <sup>[6]</sup>.

In 1959 Cohen accepted the position of assistant professor in the biochemistry department of [Vanderbilt University](#) <sup>[20]</sup>. Further experimentation on NGF led him to the discovery of epidermal growth factor in 1960. When Cohen injected mice with [mouse](#) <sup>[19]</sup> salivary extract, their eyelids opened and their teeth erupted early. He isolated epidermal growth factor in 1962, and sequenced epidermal growth factor in 1972. Cohen was promoted to full professor in 1967 and he became an American Cancer Society Research Professor in 1976. He was made a Distinguished Professor in 1986 at [Vanderbilt University](#) <sup>[20]</sup>. Upon his retirement in

2000, he was named Emeritus Professor.

[Stanley Cohen](#) [5] has received many awards including the 1986 [Nobel Prize in Physiology or Medicine](#) [7] with [Rita Levi-Montalcini](#) [8]. He was inducted into the National Academy of Science in 1980, and received the Lewis S. [Rosenstiel Award](#) [21] and the Alfred P. Sloan award in 1982. He was awarded the Louisa Gross Horowitz Prize in 1983 and inducted into the [American Academy of Arts and Sciences](#) [22] in 1984. Cohen was awarded the National Medal of Science and the [Albert Lasker Basic Medical Research Award](#) [23] in 1986. He was also honored as a member of a Uganda Stamp series featuring Nobel Prize Winners.

## Sources

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