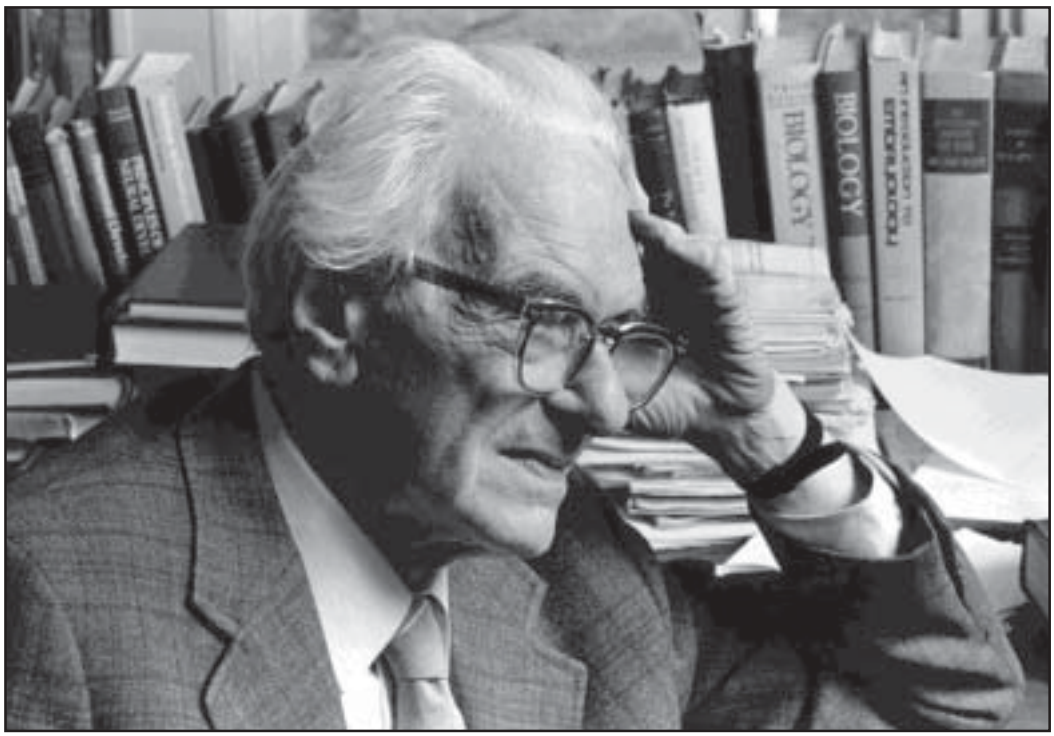
Biomedical Reviews Volume 11, 2000

ISSN 1310-392X

In Centenariam Aetatem

VIKTOR HAMBURGER: THE DISCOVERER OF CHICK EMBRYO'S NEURAL SECRETS



Viktor Hamburger is one of the few distinguished scientists to have lived through the entire 20th century. He was born on July 9, 1900 in Landeshut Silesia, Germany (now Poland). Hamburger's lifelong scientific work grew out of his deep and long-lasting love of nature, art and philosophy, nurtured by his parents and his university years. He received his PhD from the University of Freiburg in 1925, for research supervised by Professor Hans Spemann, the 1935 Nobel Laureate who discovered the "organizer-induction" phenomenon. In 1932, Hamburger received a Rockefeller fellowship to study for one year with Professor Frank Lillie at the University of Chicago, Chicago, IL. His stay in the USA became extended indefinitely when he received word that he was not welcome to return to Germany, owing to the fascist racial laws depriving Jewish citizens of all civic rights, including access to public schools and universities. In 1935, Hamburger, as Assistant Professor, joined the Department of Zoology at Washington University, St Louis, MO, and, within six years he became full Professor and Department Head, a position he held for 25 years. Viktor Hamburger assumed Emeritus status in 1969, but maintained an active and well-funded research program until he was well into his 80'ies. In his first article written in English, and published in *Journal of Experimental Zoology* 1934; 68: 449-494*, Hamburger discovered that unilateral removal of a limb bud in the chick embryo resulted in unilateral reduced numbers of motor and sensory neurons in the spinal cord. He proposed that targets act on innervating neurons by providing trophic signals that recruit undifferentiated cells to develop into motor and sensory neurons. Later on, Hamburger together with Rita Levi-Montalcini, invited by Hamburger in St Louis in 1946, repeated these limb removal experiments, and discovered that many sensory neurons undergo a period of naturally occurring cell death. They proposed that removal of a limb bud acts to enhance the normal cell death by perturbing target-derived signals that promote neuronal survival. In the early 1950's,

* A list of Viktor Hamburger's publications is available at http://library.wustl.edu~biology/vh/biblio.html

these results were further enriched using the mouse tumor sarcoma 180 implanted into the region of the chick hind limb. In today's context, Hamburger and Levi-Montalcini proposed an antiapoptotic action of the hypothetical target-derived trophic signals, identified as nerve growth-stimulating factor, later named nerve growth factor (NGF). Thus Viktor Hamburger not only established the chick embryo as the preferential model system for developmental neurobiology research, but also established the experimental paradigm having a remarkable corollary: a hypothetical trophic substance turns out to be NGF.

From our colleague-friends in St Louis we learn that a Symposium honoring Viktor Hamburger's centennial year was held on 20 October, 2000 at Washington University Department of Biology. Dr Garland Allen opened the Symposium with a presentation entitled "A pact with the embryo: the phylogeny and ontogeny of Viktor Hamburger". In this richly illustrated talk, Dr Allen showed via videotape Hamburger's link with the embryo. "Somebody said to me that the embryo would reveal his secrets to me if I would just promise not to crush him. We have both kept out promises.", said Viktor Hamburger.

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