

Obituary Erich O.R. Muscholl

Erich O.R. Muscholl was born on the 3rd of July 1926 in Hindenburg, Silesia (today Zabrze, southern Poland). Erich attended high school in Glatz, Silesia (today Kłodzko, south-western Poland), which, however, he could not finish due the circumstances of World War II. In May 1944 he was drafted to the military and saw his home for the last time, he would never return to Zabrze.

He was wounded in April of 1945 and witnessed the end of World War II in hospital. He became a prisoner of war of the British, but was released from captivity already in December 1945. In Werne an der Lippe (German State of Northrhine-Westfalia), the family re-united and Erich passed his university entrance exam in 1946.

From 1947 to 1952 he studied medicine at the freshly reopened Johannes Gutenberg University in Mainz (German State of Rhineland-Palatinate). In 1950 he started his thesis work at the Department of Pharmacology headed by Gustav Kuschinsky. He graduated in 1952 and started a first post-doc with Gustav Kuschinsky.

In 1956, Erich became a fellow of the British Council, and joined the Department of Pharmacology of the University of Edinburgh, headed by Sir John H. Gaddum. There, concepts and methods were quite different from what he had experienced in post-war Germany.

He worked in the laboratory of Marthe L. Vogt, a German emigrant to the UK. Her main interest was the physiology and pharmacology of the sympathetic nervous system and the roles of catecholamines in the brain. Together with Marthe, he clarified the mode of action of the alkaloid reserpine. It depletes the noradrenaline stores of postganglionic sympathetic nerve cells, thereby reducing the response of organs to sympathetic activity.

In 1957, Erich Muscholl returned to Mainz as a research assistant. In the coming years, he worked on his "Habilitation" in pharmacology (the German post-doctoral lecturing qualification). The title of his thesis work was: "The content of the heart in adrenaline and noradrenaline under different experimental conditions."

Around 1960 he described (at the same time as the group of Julius Axelrod, NIH; Bethesda, MD, USA), the fate of noradrenaline after being released from its nerve terminals. Shortly after release, it undergoes rapid re-uptake into the axons and is stored again in vesicles. The situation is similar with the neurotransmitters dopamine and serotonin. This discovery was fundamental to neurophysiology and to the understanding of the effects of antidepressants and the psychotropic effects of cocaine.

In 1962, Erich Muscholl developed an isolated heart model with intact sympathetic nerves together with the Yugoslav pharmacologist Seid Huković. In this model, he demonstrated for the first time that calcium was required for the release of noradrenaline. Also the effects of various drugs on nerve cells were analyzed In this model.

Between 1968 and 1970 Erich Muscholl discovered (together with Konrad Löffelholz and Ruth Lindmar) that many types of nerve endings carry G-protein-coupled receptors, so-called presynaptic receptors. The prototype found in Mainz was the muscarinic receptor at the nerve

endings of postganglionic sympathetic axons. Their activation inhibits the release of noradrenaline.

During the same time period, Erich Muscholl also clarified the mechanism of action of the antihypertensive drug methyldopa. From methyldopa, α -methyldopamine and further α -methylnoradrenaline is synthesized in the body. The latter is a so-called "false neurotransmitter", which – like the body's own noradrenaline – undergoes storage, release and re-uptake into the endings of the axons.

In 1973 Erich Muscholl succeeded Gustav Kuschinsky to the Chair of Pharmacology at the Johannes Gutenberg University in Mainz, a position he held for 18 years. In 1991 he became a professor emeritus and was succeeded in 1993 by Ulrich Förstermann.

Erich Muscholl was a member of the German National Academy of Sciences "Leopoldina" since 1983. In 1984 he received the annual award of the "Feldberg Foundation for anglo-german scientific exchange" together with Sir David J. Weatherall (at that time affiliated with the University of Oxford).

Erich Muscholl died on the 17th of January 2019 in Mainz. He had been a member of the British Pharmacological Society since 1961.

Mainz, February 2019
Ulrich Förstermann