

# In Memoriam: Krešimir Krnjević (1927–2021)

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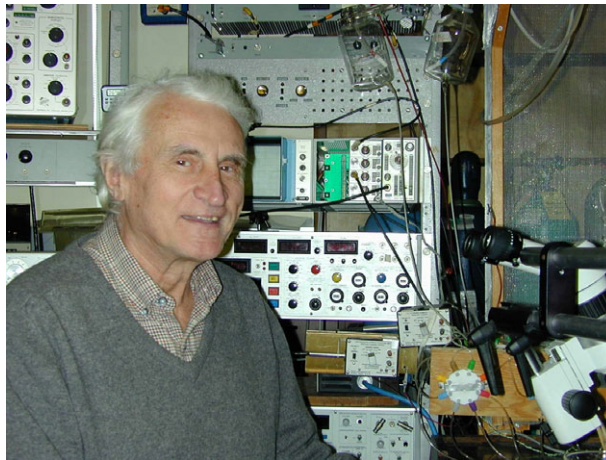
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On April 16, 2021, the world neuroscience community lost Krešimir Krnjević, one of the most influential leaders in neurophysiology research through the second half of the last century. Dr. Krnjević, also identified (but never addressed) by his colleagues and students as KK, was born in Zagreb and followed an education path that may today be defined as “globalized” even though, in part, caused by the ongoing World War 2. He studied in Switzerland, Croatia, and South Africa and obtained MD and PhD degrees from the University of Edinburgh (UK).

He then moved for postdoctoral training to the University of Washington in Seattle and then to the Australian National University in Canberra where he worked in the laboratory of the future Nobel prize winner (1963), Sir John Eccles. Back in Europe, he started his independent research career at the Babraham Institute in Cambridge (UK), and a few years later, he came to Canada to spend 1 year at McGill University as a Visiting Professor. This was the last move of his academic career; in 1966, he was hired as a staff member in the Department of Physiology.

It is hard to review all the discoveries made by Dr. Krnjević, but we are blessed to have his autobiography available on the web ([http://www.amcaqc.org/Common/Docs/Files/6037/kk\\_sfn.pdf](http://www.amcaqc.org/Common/Docs/Files/6037/kk_sfn.pdf)); there, one can also find his personal notes on the way his research career developed toward specific goals. What I can state, however, it is that Dr. Krnjević was already a legend for me when, in 1975, I began to have interest in brain function as a neurology resident at *Sapienza* University of Rome. At that time, he had published papers dealing with his several fundamental discoveries. Just to mention a few, and in fact, those which have been crafting my own research: (i) the firm identification of gamma-aminobutyric acid (GABA) as a neurotransmitter in the brain<sup>1–3</sup>; (ii) the role of calcium-dependent potassium currents in controlling neuronal excitability<sup>4,5</sup>; and (iii) the effects of acetylcholine on cortical cell excitability being caused by a decrease of potassium currents,<sup>6</sup> which later led to the identification of the so-called M-current.<sup>7</sup>



Upon entering the Montreal Neurological Institute (MNI) for the first time, on the morning of March 30, 1979, I was intrigued (but perhaps not surprised) that his name was on a list of MNI Consultants that was hanging in the entrance hall. In that instant, I realized that Dr. Krnjević was “close by” and, indeed, working in that round building called McIntyre. There, he was the Chairman of the Department of Physiology, and Director of Anesthesia Research.

My PhD supervisor and mentor, Dr. Pierre Gloor, encouraged me to visit Dr. Krnjević’s laboratory where I would return countless times to seek for his advice both as a student and as an independent researcher. As science turns out, at the time of my arrival in Canada, Dr. Krnjević was getting interested in the mechanisms underlying epileptic activity and his recent discoveries indicated that focal seizures occur when GABAergic inhibition runs down.<sup>8,9</sup> Indeed, this evidence was at odds with the preserved inhibitory mechanisms that we were identifying in Dr. Gloor’s laboratory at the MNI by analyzing the thalamocortical inhibitory interactions that lead to generalized absence seizures.<sup>10</sup> These contrasting data provided ground for several constructive discussions that continued with him over the following three decades and have inspired further work in my laboratory. These interactions finally led to a review that we coauthored in 2016.<sup>11</sup>

Going back to my first meeting with him, I recall his laboratory as a hectic place with a number of young investigators, all inspired by their boss’s leadership. During 50 years of active research at McGill University, Dr. Krnjević, trained or

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collaborated with an amazing number of fellows who in turn established their own successful research academic careers. To name a few; in Canada: Jasna Križ, Brian MacVicar, John MacDonald, Mary Morris, Ernie Puil, Leo Renaud, and Liang Zhang. Throughout the world: Jean-Marie Godfraind (Belgium); Yehezkel Ben-Ari, Anne and Paul Feltz, Yvon Lamour, and René Pumain (France); Bob Werman (Israel); Enrico Cherubini and Andrea Nistri (Italy); Jean-Pierre Dreifuss (Switzerland); John Kelly and Andrew Constanti (UK); and Mauro Costa-Mattioli (USA).

Between 1972 and 1978, Dr. Krnjević was Chief Editor of the Canadian Journal of Physiology and Pharmacology and his leadership greatly contributed to establishing the reputation of this journal. He was awarded several recognitions including Fellow of the Royal Society of Canada (1975); Alexander Forbes Lecturer Marine Biology Labs, Woods Hole, Massachusetts (1978); President of the Canadian Physiological Society (1979); Gairdner International Award (1984); Officer of the Order of Canada (1987); and Wilder Penfield Prize from the Government of Québec (1997).

Dr. Krnjević was a scientist, a discoverer, a humanist, and an invaluable guide for those who were lucky to know him in person. His prodigious contributions will be appreciated by the world neuroscience community for years to come.

#### DISCLOSURES

The author has no conflicts of interest to disclose.

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