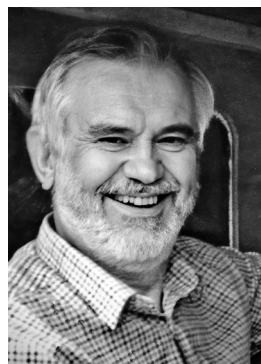


Kai Krohn

* 29.7.1936 † 11.7.2023



Long-standing Professor of Pathology and Medical Technology at the University of Tampere Kai Krohn died on 11 July 2023 at the age of 86. He was born in Helsinki on 29 July 1936 as the middle child in a family of five children. Krohn's colourful personality and his understanding of future trends played a key role in the development of Tampere University into an international player in medicine and science and paved the way for cooperation between the universities in Tampere. Krohn was a successful researcher and versatile visionary.

As an artistically, mathematically and visually talented person, Krohn originally planned a career as an architect. However, medicine eventually won out and he graduated as a physician from the University of Helsinki in 1962, obtained his PhD in 1968 and became a Specialist in Pathology in 1969. He was appointed the first Professor of Pathology at University of Tampere in 1973 and Professor of Medical Technology in 1995. He retired from this post in 2001, but remained active in his scientific work almost until his death. He was appointed a member of the Finnish Academy of Science and Letters in 1999 and was conferred the title of Honorary Doctor at the University of Tartu in 2009.

Some of the most conspicuous features of Krohn's scientific career were the early recognition of rising research fields and methods, making use of chance findings and boldly diving into new territories. His doctoral thesis was on the mechanisms of autoimmune diseases, i.e. how the human immune system sometimes mistakenly attacks its own tissues. He continued and expanded this pioneering new line of research as a post-doc researcher in New York. Through a series of coincidences, Krohn ended up also studying liver diseases and so-called serum hepatitis at the New York Blood Center. He and his colleagues noticed that this liver disease, which had been assumed to be autoimmune in nature, could be traced back to virus-like particles using an electron microscope. The work was published and contributed to the identification of hepatitis B viruses and many related scientific breakthroughs.

After returning to Finland, Krohn was appointed Professor of Pathology at the newly established Faculty of Medicine at University of Tampere. In this post, he focused his attention on another new field, cancer immunology and the possibility to diagnose and treat cancer using immuno-

logical methods. This led to one of the first randomised controlled trials done in Tampere, where patients with lung cancer were given immunologically targeted experimental therapies in addition to the established therapy. In the early 1980s, Krohn visited the USA to learn about a new technology that had revolutionized medicine, the production of monoclonal antibodies. His research group in Tampere then developed such antibodies against so called neoantigens in breast and ovarian tumours and tested their applicability for various clinical purposes. The results were positive in terms of diagnostics and the monitoring of treatment, but the products were not yet ready therapeutic use. Now, four decades later, immunological cell therapies have developed into highly effective cancer therapies and many new cancer drugs are monoclonal antibodies.

In the early 1980s, medical journals published articles on an alarming new disease that caused loss of immunity and led to death rather quickly, typically due to severe infectious diseases. The disease was named AIDS (acquired immunodeficiency syndrome) and in 1983 it was found to be caused by the HI (human immunodeficiency) virus. Already at this stage, Krohn predicted the global significance of the new disease and shifted the main focus of his research team to HIV research. He spent a sabbatical at the National Institutes of Health in the USA, working in the laboratory of Robert C. Gallo who discovered the HI virus. During this time, Krohn built an extensive network of contacts and partners in the USA, which helped him over the next 20 years as he published an impressive body of research on the pathology and vaccination options of HIV infections. It is specifically for his HIV/AIDS

research and vaccine development that Krohn is best remembered, both in Finland and abroad. Krohn also understood the necessity of applying research in practice and established e.g. a company to develop an AIDS vaccine.

The HIV epidemic led Krohn back to studying viruses, but on the other hand, it also later drove him once again to examine the mechanisms underlying autoimmune diseases. In the background was Krohn's strong focus in his HIV research on the new opportunities offered by molecular biology and gene technology. With the help of these new methods, he saw the opportunity to return to an unanswered research question that he had studied when he was younger: what causes the rare APECED syndrome (autoimmune polyendocrinopathy-candidiasis-ectodermal dystrophy) in children. While working on his doctoral thesis, Krohn learned that children with APECED have similar, but more rapidly progressive tissue damage than the studied laboratory animals. The test methods available at the time were unable to identify the mechanism causing APECED, but gene technology eventually revealed that the disease is caused by a mutation in the autoimmune regulator gene (AIRE). This finding was published in 1997 by a Finnish-Japanese-Swiss team of researchers, coordinated by Krohn, in the renowned *Nature Genetics* journal. The sense of achievement was obvious, considering that a solution had finally been found to this old problem, 30 years after the question had first been asked.

Universities today emphasize the importance of international relations, but for Krohn, this was a natural and characteristic feature already more than 50 years ago. He himself worked in the USA on

three occasions for a total of about five years, and since the 1980s, his team in Finland almost always had some foreign researchers in it – from the USA, China, Japan, the Baltic countries and elsewhere in Europe. He developed particularly close ties to the research community in Estonia, which included many of his most long-standing partners. He organised numerous international meetings in Finland and coordinated several multinational research networks. International relations – and versatile ones at that – were in Krohn’s view a prerequisite for the development of research, and his team was always open to new cultures and ideas.

Basic education in medicine was not Krohn’s forte, but he was extremely passionate about the education of young researchers. He supervised about twenty doctoral theses and also mentored master’s degree students and post doc researchers. He advised them to think critically and remember that the first thought that comes to mind is not necessarily the right one. As a researcher, he described himself as an eternal contrarian. “I always disagree in principle, even with myself;” Krohn is recalled to have said. To a young researcher, this critical attitude provided a memorable lesson – although Krohn’s opposition was not always limited to research questions alone and occasionally upset people in the university community.

Bringing education in the natural sciences to Tampere to support medical research and education was Krohn’s long-term, well-founded goal, which he eventually achieved. In the early 1990s, in the middle of the deepest depression, the Faculty of Medicine was under threat of closure, but the rescue operation led by Krohn managed to turn the situation around and

save the faculty and establish two separate units, the Institute of Medical Technology (IMT) and the Department of Health Sciences. This was a major step for the University of Tampere and, in retrospect, absolutely the right decision from the national perspective as well.

IMT had a clear goal to become a high-level international research unit, with Krohn boldly recruiting researchers who were on a rising career trajectory. They were given a free hand to conduct ambitious research under a very light administrative structure. This concept proved a success, leading e.g. to the formation of the university’s first Academy of Finland Centre of Excellence. IMT adopted several practices that were new not only locally, but also nationally, such as regular evaluation by the Scientific Advisory Board and the related rolling tenure system. Together, these created an environment where researchers could pursue their dreams and visions and where new trends could be embraced quickly. One example of these is the establishment of Finland’s first professorship in bioinformatics.

Krohn’s open-minded visionary approach and determination to pursue causes that he felt were right, combined with his room-filling personality, served as the cornerstones of IMT’s development. As an example of this, Howy Jacobs still recalls his recruitment in what was a fairly conservative Finland in the 1990s. Krohn looked beyond the appearance of the punk rocker and saw an outstanding researcher, one who would later be named Academy Professor and Professor of the Year. Just before his retirement, Krohn managed to get an amendment passed to the Universities Act that also enabled education in the natural sciences at IMT. Already the following

autumn, the first students began studying in the new type of study programme, which was based on the idea of having a concrete link to research. Cooperation with the Tampere University of Technology (TUT) began on day one and became concrete when the programme was divided into two degree options, Master of Science (Technology) and Master of Arts, and the word ‘Technology’ in IMT’s name also became justified.

IMT later developed to become part of what is now the Faculty of Medicine and Health Technology and served as a concrete example of the smooth cooperation between the universities in Tampere and the opportunities offered by interdisciplinary activities. One could argue, with good reason, that Krohn’s far-reaching vision and active efforts to establish IMT were extremely beneficial for University of Tampere. IMT made high-quality research and education in biomedicine and biotechnology one of the international strengths of Tampere and introduced new ideas to the university’s way of doing things. The alumni of this school now hold some of the key leading positions at the university.

Krohn had an astonishingly wide range of interests and skills. He was interested not only in his local environment, but also world affairs. Krohn co-founded a society to protect the ruins of the Church of St. Michael in Pälkäne and helped undertake an archaeological excavation at the site. After retirement, he got involved in politics

on the municipal council of Pälkäne and also learned to play the piano. Having considered a career in architecture as a young man, Krohn’s dream came true in the form of a grand log house that he built in Pälkäne. He felled the mighty pines for the house from his own forest with his wife, Professor Annamari Ranki. Many friends and international research colleagues had a chance to enjoy the hospitality and roast lamb on the Iltatähti estate. Krohn’s carpentry skills culminated in a boat he built with his own hands, which the family would take out on the waterways of Kustavi. The flow of refugees in the 2000s inspired Krohn to write a book of poetry entitled “Lähtö Afrikasta” (“Leaving Africa”). He also wrote a memoir *Oma ja vieras* (“Self and non-self”), where the title refers to his career as an immunologist and a virologist, but also the theme from a broader human perspective. The cover of the book features a watercolour painting by the author himself.

As a person, Krohn can be described as the Renaissance man of our times. He was a versatile visionary who recognized future trends and seized them boldly, not letting other people’s doubts get in the way. Krohn’s students and colleagues remember him as a charismatic, inspiring and dynamic leader whose personality worked like a magnet, pushing people to move new things forward together. Krohn’s six children continue his life’s work in the fields of medicine, culture and architecture.

*Per Ashorn, Howy Jacobs, Kalle Saksela
and Olli Silvenmoinen*