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Kai Simons

Kai Simons was born and raised in Helsinki, Finland and, despite the ex-patriotism of most of his adult life, he still has strong ties to his homeland. Other than some young memories of the war, Simons says his overriding memory of childhood, summers spent on a farm, is happy. His young years were dominated in part by his love for reading, which he did voraciously; this is what he primarily attributes for his interest in science at a young age.

Simons (pronounced See' mans) did not grow up with a vision of what he wanted to be; it was his father, a physicist, who ultimately influenced his career path. For a time Simons thought he would follow in his father's footsteps by pursuing physics, but after finishing high school, Simons' father sized up his son and gave him some very good advice: that he didn't think he was good enough at physics, suggesting medicine instead. Simons had been determined to become a physicist, but his father, a farmer's son, was a pragmatic person and advised him that biomedical research would be fine as well and had the advantage that if one failed at it, he could always be a real doctor. So Simons chose medicine when he enrolled at the University of Helsinki. This led to Simons' work during college summers in Stockholm for Bengt Samuelsson, later a Nobel Laureate, and ultimately to his research, as a student, on the mechanism of vitamin B12 absorption. Simons explains that Finns eat a great deal of raw fish which in the eastern part of the country led to endemic tape worm infestation and in rare cases to pernicious anemia. Simons and his fellow medical students organized a campaign to rid the population of tapeworm by distributing anti-worm drugs. These activities inspired Simons to complete his M.D. and Ph.D. and fully concentrate on biomedical research.

Following graduate studies, Simons went to the United States to take a postdoctoral NIH fellowship at the Rockefeller University with A.G. Bearn on serum protein polymorphisms. He recalls that as he moved to the U.S. he had no idea what was going on in science and no idea where to go next, but I was lucky that I ended up at Rockefeller, especially working with Bearn and meeting fellow Finn Leevi Kaariainen. Kaariainen was working on an animal virus that was enveloped by a stunningly simple membrane. This virus, called Semliki Forest virus, was to provide the turning point in Simons' research career.

After two years at Rockefeller, Simons returned to Finland. I had always planned to come back, he recalls. Back home he worked as a Junior Investigator for the Finnish Medical Research Council. He continued his work on serum proteins, but slowly also started work on the Semliki Forest virus. It was at this point that Simons began to rethink his research goals. He spent one crucial month in this period at the MRC Laboratory for Molecular Biology in Cambridge, where current ASCB President Liz Blackburn was at the time, in the lab of Brian Hartley. It was Hartley who encouraged Simons to turn his major attention to the Semliki Forest virus.

Simons observes that although he and others felt significant anxiety about their careers, back then people didn't talk about it. There were scarce funds for biomedical research when he was starting out in Finland, but he managed to gain an appointment at the Hartman Institute in Helsinki, which boasted a brand new building, an interesting mix of people, and some funding. As a protein biochemist, he worked on proteins and lipids, studying all aspects of the virus to which he now turned his full attention. Simons identifies the strength of the institute as the freedom it allowed its young investigators who teamed together to unravel the secrets of the virus. The Director of the Institute, K. O. Renkonen, was an elder statesman in the field. He didn't interfere, but was extremely supportive of our work. Funding for research was modest, but the institute was able to generate income by performing lab analyses at the associated medical center.

Although Simons never thought he would leave Helsinki, he was seduced by the opportunity to join the effort to be part of the European Molecular Biology Laboratory in Heidelberg, Germany in 1975, headed by John Kendrew. There, he and fellow Finn Ari Helenius, who was Simons brother-in-law (Helenius had married Simons' sister and the two families built and shared a house together in Finland), helped to build up the EMBL to become a major world center for cell biology. Simons, who has been at the EMBL ever since, ultimately became Senior Scientist and Coordinator of the Cell Biology Program there. (Helenius, who was for many years Chairman of the Department of Cell Biology at Yale, went on to serve the ASCB in several capacities, including as Councilor, Publications Committee member and Associate Editor of *Molecular Biology of the Cell*; he recently returned to Europe with his research group and is now heavily engaged in reorganizing biochemistry and molecular cell biology at the Swiss Federal Institute of Technology in Zurich.) Helenius says that when he and Simons came to the EMBL, Kai quickly took on a leadership role at EMBL in the area of cell biology. Kai has incredible intensity and enthusiasm which he uses to motivate people to perform beyond their capability. He brings out the best in people by being supportive and constructively critical.

Simons believes that one important avenue to great science is teamwork. He says, I have built my research career on working closely together with other scientists, not only in my own research group, but also with teams of other scientists. This was the case in Helsinki when we together with Leevi Kaariainen

and Ossi Renkonen, a lipid biochemist, formed three teams working together on the Semliki Forest virus.

This was true when Henrik Garoff, Ari Helenius and I left Helsinki to continue our work on the life cycle of the virus at EMBL. And it was again true when those teams expanded with Bernhard Dobberstein, Gareth Griffiths, Daniel Louvard and Graham Warren to form the Cell Biology Program at the EMBL. Ira Mellman of Yale, who originally met Simons through Helenius, says no one is more open than Kai. He is the type of person with whom you share an idea moments after you get it and he instantly provides scientific insight and enthusiasm. Mellman often seeks opportunities to collaborate with Simons because of Simons non-competitive manner.

In the past few years, Simons has become increasingly active in the ASCB. In 1990, he was Keith Porter Lecturer at the Annual Meeting in San Diego. He served as Vice President for the International Congress on Cell Biology (hosted by the ASCB in 1996), and last year he became the first ASCB member residing outside the U.S. to be elected to Council. Simons admits, I was surprised to be elected to Council. I agreed to run thinking, 'no problem I won't win, they won't elect someone to an American Society who is from Europe.' Simons welcomes the opportunity to serve on Council not only to provide a European perspective to the Society's governance, but also to learn how such an organization works so that he could take this knowledge back to Europe and use it to improve organization there. According to Simons, the ASCB is so much better organized in the States and we are jealous of that. (He was overheard at the conclusion of his first Council meeting to mutter in amazement, back home they would never believe how much we accomplished.) Simons is especially impressed with how well committees such as Public Policy and Women in Cell Biology function in the Society. He contrasts these ASCB committees to his experience in Germany, where, only 5% of the tenured professors are women; its like it was in the States twenty years ago. He feels there is an urgent need to do something about the lack of women in science in Europe. He also watches with great interest the skillful way in which American scientists have worked in public policy through the ASCB to ensure funding for their research. Most recently, Simons accepted the invitation of ASCB President Mina Bissell to serve as Chair of the Society's International Affairs Committee, succeeding its first Chair, Doug Murphy. Simons hopes to replicate the other committees' activism with the ASCB IAC under his chairmanship. He recruited many prominent cell biologists from around the world to the Committee, which will require electronic communication to effect the Committees business. Simons' goals for the Committee are to work with the International Federation on Cell Biology to improve the International Congress on Cell Biology, to develop an international section for the ASCB Newsletter, and to recruit more non-U.S. members to the ASCB.

Simons was recently elected president of a new organization called the European Life Scientist Organization (ELSO). He hopes that ELSO will do for Europe what the ASCB has done for the U.S. Above all, the plan is to organize an Annual Meeting modeled after the successful ASCB meetings to catch the excitement that characterizes biomedical research today. The highlight of the meeting will be the poster sessions. Simons says, it is incredibly stimulating to see the action and hear the buzz that fills the air around the ASCB posters. Mellman is optimistic about Simons prospects for advancing the international cause; he is the most enthusiastic, tireless advocate in all of Europe, with no sign of letting up, for cell biology.

Simons' current research focuses on the membrane of viruses and cells, which, he believes, can be used as tools to cure disease. This work has led Simons to focus on the role of lipids and cholesterol to organize cell membranes. He has concluded that sphingolipids form rafts that float in the lipid bilayer and these rafts attract specific sets of proteins, which perform their functions attached to the rafts. The most surprising conclusion is that cholesterol works as a dynamic adhesive to keep the rafts together. Simons thinks that this is the main function for cholesterol in our bodies. We depend on cholesterol: too much is bad, but too little is bad as well, because we need the cholesterol to move proteins in our cells. Simons will take his work with him to his new home in Dresden, Germany where he will start a new Max Planck Institute for Molecular Cell Biology and Genetics as part of a gang of four: Wieland Huttner, Tony Hyman, Marino Zerial and myself. The new institute is presently being planned and built. Simons managed to persuade the Max Planck Society to engage Finnish architects and he is excited about their plans. Dresden is today a beautiful city and if we want to create a new center in cell biology and genetics to serve Central Europe, we'd better make the institute attractive in all respects. The building will house about 25 independent research groups and it will start its activities in 2000. Working together is more rewarding, more efficient and, above all, more fun than putting all your energy into your own research group.

Simons also sees the importance of teamwork in his family life. Of his wife Carola, he confides, I have been more than fortunate in having such a fantastic spouse. She has been incredibly supportive and flexible. Fortunately she has a profession which is in demand everywhere. When we move to Dresden, she will give up her well-functioning dental practice and start again for the third time. The Simonses have three children, including twins Mikael and his sister Katja. Mikael is doing research in neurobiology and specializing in neurology in Tuebingen and Katja has finished her sociology degree in Berlin where she hopes to develop a career in urban planning. The Simons younger son, Matias, is also in medicine. Unlike his own father, Simons claims that he did not try to advise his children about their careers. Outside of work, Simons likes to play sports. He says of himself, I was never good at sports in school, but now I play basketball every week and I also play on a local father-son soccer team. He enjoys skiing, too, and of course, reading, which he tries to do in diverse areas, carrying through adulthood his earliest childhood passion.