



From Molecular Biology to the Box Office – Eric Kandel's *In Search of Memory*

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By Philipp Marxgut

Eric Kandel is a genuine all-rounder. After becoming one of the greatest neuroscientists of our time, winning the Nobel Prize in Physiology or Medicine in 2000 for his contributions to the study of memory storage in the brain, the Columbia University professor published his 2006 autobiography, *In Search of Memory*. The book was much acclaimed not only by fellow scientists, scientific journals, and the like, but also by people without a science background. Consequently, Kandel was awarded the “2007 Communication Award” by the US National Academies, a prestigious award recognizing demonstrated excellence in reporting and communicating science to the general public.

Lewis P. Rowland, editor-in-chief of *Neurology Today*, wrote in 2006: “This compelling book would make a great motion picture. *Aplysia* may not be Hollywood handsome, but what a character.” Two years later, Petra Seeger answered his prayers and portrayed the neurologist and his object of study in a compelling 95-minute documentary film.



The film, *In Search of Memory*, was released in Vienna in May 2008 in the presence of Eric Kandel and his family, and the Austrian Federal President Heinz Fischer. Petra Seeger, the director and producer of the portrait, succeeded in drawing the arc of Kandel's life from his childhood in Nazi-occupied Vienna, which he was forced to leave in April 1939, to the Nobel Prize ceremony at the Stockholm Concert Hall, and his personal rediscovery of Vienna.

Within this time span of more than six decades, Kandel always followed his interest in the nature of memory, which was – as he says – rooted in his experiences in Vienna. The persistence of these memories led him through his journey from studies in contemporary Austrian and German history, to psychoanalysis and medicine, to biology, where a genetic and molecular revolution was unfolding in the second half of the 20th century, not least due to his contributions.

In addition to the uncontested scientific excellence of the main character, *In Search of Memory* weaves together the research career with the personal biography of Kandel. He has the striking ability to explain in a clear and understandable style what his research is about; how the memory of events that happened in the 1930s have influenced and guided him throughout his academic career; why the biology of mind is of great importance to the life of millions of people; and how his family, especially his wife Denise, always encouraged him to explore his original idea of examining the biological basis of mental function.

In Search of Memory is a significant contribution to bridging the gap between world-class science and the layman. The autobiographical portrait communicates “in simple terms how the new science of mind emerged from the theories and observations of earlier scientists into the experimental science that biology is today,” as Kandel writes in his book.

Reductionism is the cornerstone of his scientific approach: “one cell at a time.” Kandel chose the giant marine snail *Aplysia* as the suitable animal for his studies. *Aplysia* has a relatively small number of some of the largest nerve cells in the animal kingdom, about 20,000 (compared to 100 billion in the mammalian brain). This allowed him to measure and record the electrical activity of its neurons and eventually to work out, for the first time, the precise wiring diagram of a behavior. Kandel’s work showed how “transmitters ... in the neural cell create short- and long-term memory, forming the very basis for our ability to exist and interact meaningfully in our world,” as the Nobel Committee at the Karolinska Institute put it.



Eric Kandel and film director Petra Seeger during the shooting in Hoboken

Kandel’s book and Seeger’s documentary are invaluable contributions to helping non-scientists understand how (his) brain science works, how he developed theories and interacted with fellow scientists to support or dismiss them. Kandel also makes clear how the results of basic research can directly affect people’s lives with the development of new ways to treat mental or neurological illnesses, like depression, schizophrenia, or Parkinson’s.

Turning research results from the lab into new products requires collaboration between academia and business. In the field of neural science, this separation started to break up in the 1980s. Kandel was a witness to this change of mindset within a university environment that was initially rather skeptical towards business. At first reluctant to get involved with industry, he has observed how scientific results launched the entirely new biotechnology industry, creating thousands of new jobs as a “by-product.”

Eric Kandel’s oeuvre represents a blueprint for a scientist’s career and how (biological) research is carried out. The ingredients are curiosity, joy, and personal interest, academic freedom, and an inspiring international academic environment with continuous discussion and debate, flat hierarchies, etc. He found these favorable conditions in the United States and its academic institutions. His research has brought him numerous awards and recognitions, the latest on June 5, 2008, when he was awarded an honorary doctorate by Harvard University in recognition of his outstanding achievements.

In Search of Memory is also a pick for those who seek advice on how an environment can be created where academic excellence thrives and prospers. Quite possibly it provides stronger policy advice than many reports generated by committees of high level experts. Certainly it is more entertaining.



Eric Kandel with his wife Denise and their daughter Minouche at the premiere (I.S.T. Austria)

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