

THE  KAVLI PRIZE
B I O G R A P H I E S
N E U R O S C I E N C E

Richard H. Scheller, Thomas C. Südhof and James E. Rothman

Richard H. Scheller

Richard H. Scheller is Executive Vice President of Research and Early Development at Genentech, where his role is to see basic research translated into the development of new treatments for human disease. Scheller was born on 30 October 1953 in Milwaukee, Wisconsin. He studied chemistry first as an undergraduate then Ph.D. student at the California Institute of Technology, followed by a stint in biology. But in 1981 the east coast beckoned, in the form of an opportunity to work on the genes responsible for behaviour with Eric Kandel and Richard Axel at Columbia University – both of whom went on to win Nobel Prizes in 2000 and 2004 respectively. Scheller impressed Kandel with his desire to enter the realm of neuroscience with no previous background in the field, and his use of the new recombinant DNA techniques to identify genes encoding for signalling molecules called neuropeptides. He continued with a creative molecular biology approach to neuroscience with faculty positions at Stanford University from 1982 onwards in the Departments of Biological Sciences and Molecular and Cellular Physiology, and at the Howard Hughes Medical Institute, Stanford University Medical Center. During this time Scheller cloned and identified proteins responsible for controlling the release of neurotransmitters and demonstrated their importance to signalling in the nervous system, for which he shared two awards with Thomas Südhof: the W. Alden Spencer Lecture in 1993, and the National Academy of Sciences Award in Molecular Biology in 1997.

In 2001 Scheller began a new career with the biotech company Genentech as Senior Vice President for Research, where he enjoyed the freedom to continue basic research and publishing new findings in cell biology, including on proteins called Rab GTPases, which regulate the transport of structures within cells. He also continued teaching, and has held the position of Adjunct Professor in the Department of Biochemistry and Biophysics at the University of California San Francisco, School of Medicine, since 2004. He became Chief Scientific Officer in 2008, responsible for developing the company's research and drug discovery strategy, and then became Executive Vice President for Genentech Research and Early Development when Genentech merged with Roche in 2009.

Among his other awards, Scheller was made Fellow of the American Academy of Arts and Sciences in 1998, Member of the National Academy of Sciences in 2000, and given the Life Sciences Distinguished Alumni Award at the University of Wisconsin-Madison College of Agricultural and Life Sciences in 2009.

Web page:

<http://www.gene.com/gene/research/sci-profiles/research/scheller/profile.html>

Thomas C. Südhof

Thomas Südhof is Professor in Molecular and Cellular Physiology at Stanford University School of Medicine. Südhof was born in Göttingen, Germany, on 22 December 1955. He developed his interest in cell biology while working with

Viktor P. Whittaker at the Max Planck Institute for Biophysical Chemistry, where he obtained a Ph.D. on the secretion of hormones from the adrenal gland.

In 1983 Südhof moved as postdoc to the US to join the laboratory of Michael Brown and Joseph Goldstein at the University of Texas Southwestern Medical Center at Dallas. He succeeded in cloning of the receptor of LDL (the low-density lipoprotein receptor), contributing to the reputation of Brown and Goldstein who in 1985 were awarded the Nobel Prize in Physiology or Medicine for their work on cholesterol metabolism.

Südhof secured his first independent position as Assistant Investigator at UT Southwestern in 1986, and received several promotions to the position of Professor in the Department of Molecular Genetics (1991–2008), and Director of the Center for Basic Neuroscience. During this time he set out to elucidate the molecular basis of signalling in the nervous system, focusing specifically on how chemicals known as neurotransmitters are released at junctions between neurons called synapses. Südhof succeeded in cloning and identifying a range of proteins involved in this process, and received several awards. He then moved to Stanford University School of Medicine where he has continued to research the mechanisms of neuronal signalling at the pre-synaptic membrane. More recently, Südhof has turned his attention to understanding diseases such as Alzheimer's, Autism and Schizophrenia.

Among his many Honors and Awards, Südhof was elected to the US National

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See also:

The Kavli Prize
www.kavliprize.no

The Kavli Foundation
www.kavlifoundation.org

Academy of Sciences in 2002, and the Institute of Medicine in 2007, and in 2008 shared the Bernhard Katz Award of the Biophysical Society with Reinhard Jahn.

Web page: <http://neuroscience.stanford.edu/research/laboratories/SudhofLab.html>

James E. Rothman

James E. Rothman is Professor and Chairman in the Department of Chemistry at Yale University. Rothman was born in Haverhill, Massachusetts in 1950. As a teenager he was fascinated by theoretical physics, but decided suddenly to switch to biology as an undergraduate at Yale University, after an introductory lecture by Fred Richards. He then made another switch while at Harvard University, from a medical degree to the pursuit of a scientific career, and with the guidance of the brilliant Eugene Kennedy he investigated how the lipid bilayer of cell membranes is formed. He was awarded a Ph.D. in 1976.

During a brief post-doctoral fellowship with Harvey Lodish at the Massachusetts Institute of Technology Rothman learnt to work with viruses and cell-free systems – thus acquiring skills that would later prove invaluable for identifying molecules involved in vesicle trafficking.

Rothman was drawn to his first professional appointments at Stanford University's Department of Biochemistry by the great enzymologist Arthur Kornberg, who taught him that biochemistry could provide a route to dissecting complex biological systems. He returned to the

east coast in 1988 for appointments at Princeton University and the Sloan-Kettering Cancer Center and the Sloan-Kettering Institute, before moving to Columbia University and eventually returning to Yale University in 2008.

Rothman's pioneering work has centred on how cells take up nutrients, move substances around within their interior, and release hormones, growth factors and other factors to their environment. In 1993, while at the Sloan-Kettering Cancer Center in New York, Rothman performed the key experiment that has forever linked his work to that of Thomas Südhof and Richard Scheller, by demonstrating that the same molecules which control this process in the nervous system, in the release of signalling molecules called neurotransmitters, are important to vesicle transport and fusion in all cell types. The finding was a springboard for extensive research in yeast, plants and animals, including humans, showing the universal importance of the molecules involved. Rothman continues to investigate the basic mechanisms responsible for intracellular transport and secretion of neurotransmitters and other proteins.

Rothman has received numerous honors and awards, including the King Faisal International Prize in Science (1996), the Lasker Award in Basic Medical Research (2002), Honorary Member, Japanese Biochemical Society (2005) and Fellow, American Association for the Advancement of Science in 2007.

Web pages:
<http://medicine.yale.edu/cellbio/rothman>

http://medicine.yale.edu/cellbio/rothman/people/james_rothman.profile

By Julie Clayton, Science writer