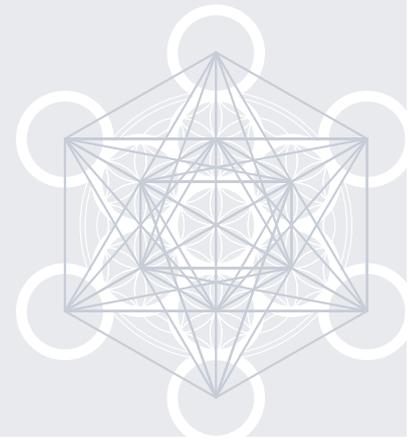


THE  KAVLI PRIZE  
BIOGRAPHIES  
NEUROSCIENCE

*Pasko Rakic, Thomas Jessell and Sten Grillner*



## Sten Grillner

Sten Grillner studied at the medical faculty in Gothenburg, Sweden, and received his PhD in neurophysiology in 1969. He has been a Professor and Director of the Nobel Institute for Neurophysiology at the Karolinska Institute since 1987.

His research has focused on the extraordinary capability of the brain to control movement. Early on he demonstrated that networks within the mammalian spinal cord can produce the detailed motor pattern of locomotion involving the coordination of hundreds of different muscles. In a paper published in 1987, he and colleagues went on to unravel the details of a core network of interacting interneurons in the lamprey as a vertebrate model system. The level of detail gained in this work was, and still is, unique in that it allows the observation of changes in behaviour caused by changing occurring at the cellular and network level. The cellular basis of locomotion, steering and posture is now understood in this biological model system, and the basic design appears conserved from cyclostomes to primates.

Grillner is a member of the Academia Europaea, Royal Swedish Academy of Science and the Nobel Assembly, and has received a number of awards including the Bristol Myers Squibb award in 1993 and the Reeve–Irvine award in 2002.

## Thomas Jessell

Thomas Jessell received his PhD in neuropharmacology at Cambridge University,

UK, and went on to become a postdoctoral fellow in Gerald Fischbach's laboratory at Harvard Medical School, in the US, and then in 1981 an Assistant Professor in the Department of Neurology, also at Harvard. In 1985 he moved to Columbia University, New York.

Throughout his career Jessell has focused on the early wiring of the vertebrate central nervous system. His research has identified the strategies and molecules involved in assembling neural circuits, and has laid the groundwork for new ways of reconstructing these circuits when they have been damaged through trauma or neurodegenerative disease. His profound influence in his field is demonstrated by his steady production of research papers referenced by large numbers of his peers. During the 1990s he produced around two dozen papers that went on to be cited over 100 times during the following decade, and at least six that were cited over 300 times.

In 1992 he was a senior member of the international team that set out to find the mammalian equivalents of the hedgehog gene known to play an important role in pattern formation in the developing fruit fly. The result was the discovery of three new mammalian genes - known as sonic, Indian, and desert hedgehog - and the realisation that the proteins they coded accounted for a significant proportion of all developmental interactions known to occur in the vertebrate embryo.

Along with colleagues he founded Ontogeny Inc., a biotechnology company based in Cambridge, Massachusetts, that aims to use developmental biology approaches to create new treat-

ments for diseases such as diabetes to Parkinson's. Jessell is a fellow of the UK's Royal Society, a foreign associate of the US National Academy of Sciences, a member of the Institute of Medicine, and a fellow of the American Academy of Arts and Sciences.

## Pasko Rakic

Pasko Rakic was born in Yugoslavia and studied medicine at the University of Belgrade, before beginning a career as a neurosurgeon. His research career started with a fellowship at Harvard University in 1962. One of his first experiments involved injecting rhesus monkey foetuses with radioactive thymidine at a particular stage of development. By looking at which cells were replicating, Rakic was able to trace the lineage of brain cells as they were created.

His team sliced the brains of each monkey into 7,000 sections to allow future researchers to study them without having to repeat the experiment. This and other work on mice allowed Rakic to work out the fundamental processes of mammalian neural development. He established, for example, that the neurons of the cerebral cortex originate in the subventricular zone, which he discovered and named, rather than being generated in the cortex.

In 2002 he received the 15th Bristol-Meyers Squibb Award for Distinguished Achievement in Neuroscience. The prize committee noted his radial unit hypothesis, that in the developing cerebral cortex the cells are created at the base of each

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*See also:*

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*The Kavli Foundation*

[www.kavlifoundation.org](http://www.kavlifoundation.org)

column, and that each new cell migrates past its predecessors, and the related “protomap” hypothesis on external signals determining cell function as it grows and forms complex connections.

Rakic often collaborated with his wife and fellow distinguished neuroscientist Patricia Goldman-Rakic until she was tragically killed in a road traffic accident in 2003. He has been elected to the US National Academy of Sciences and the American Academy of Arts and Sciences.

