

• Susumu TONEGAWA

Picower Professor of Biology- Massachusetts Institute of Technology; Université de Kyoto, Japon

Prix Nobel de Physiologie et Médecine (1987).

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Membre associé
(nommé en 2006)

Susumu Tonegawa is a Japanese scientist who won the Nobel Prize for Physiology or Medicine in 1987 for «his discovery of the genetic principle for generation of antibody diversity.» Although he won the Nobel Prize for his work in immunology, Tonegawa is a molecular biologist by training. In his later years, he has turned his attention to the molecular and cellular basis of memory formation.

Tonegawa is best known for elucidating the genetic mechanism in the adaptive immune system. To achieve the diversity of antibodies needed to protect against any type of antigen, the immune system would require millions of genes coding for different antibodies, if each antibody was encoded by one gene. Instead, as Tonegawa showed in a landmark series of experiments beginning in 1976, genetic material can rearrange itself to form the vast array of available antibodies. Comparing the DNA of mouse embryo in which antibody-producing B cells have not yet developed with the DNA of the mature B cells of the adult mice, Tonegawa demonstrated that the genes for antibody proteins are moved around, recombined, and deleted during the lifetime of individual animals, phenomena completely unexpected from the thereto established dogma of genome stability during the development of individual animals. This dynamic nature of antibody genes allows their extensive diversification in adult animals.

Tonegawa was born in Nagoya, Japan and attended the Hibiya High School in Tokyo. He received his bachelor's degree from Kyoto University in 1963. He received his doctorate from the University of California, San Diego. He did post-doctoral work at the Salk Institute in San Diego in the laboratory of Nobel laureate Renato Dulbecco, then worked at the Basel Institute for Immunology in Basel, Switzerland, where he performed his landmark immunology research. In 1981, he became a professor at the Massachusetts Institute of Technology, and founded and directed the Picower Institute for Learning and Memory at MIT until December 31, 2006.

Presently, Dr. Tonegawa is Director of the RIKEN-MIT Neuroscience Research Center at MIT and Investigator of the Howard Hughes Medical Institute at MIT.