



The Squid Giant Synapse: A Model for Chemical Transmission

By Rodolfo R. Llinas

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The squid giant synapse is the single most important model for investigating the transmitter release mechanism in chemical junctions. This unique book, by a leading expert in the field, gives a concise overview of all that has been learned about synaptic transmission in this superb model system. It covers in detail the biophysics of the voltage-dependent calcium currents, calcium concentration microdomains, and much of the molecular basis for the triggering of the secretory event. Ideal for graduate and undergraduate courses, the book includes PC and Macintosh versions of two programs for simulating and manipulating any aspect of synaptic transmission. One program is a modeling tool designed for working neuroscientists, and the other teaches the basic principles of synaptic transmission by allowing students to alter the parameters, essentially without limits, and see the effects on the action potential over time. Anyone studying this central topic of neuroscience will find this book an invaluable resource.

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Editorial Review

Review

"Given that the brain consists of some 100 billion nerve cells, understanding how synapses allow these cells to communicate with each other has been a core question in neuroscience. The past 50 years have seen remarkable advances in this area, largely due to a small number of experimental systems--such as neuromuscular synapses and the squid giant synapse--whose great advantages for physiological analyses have illuminated the beauty of synaptic function. Thus a book, such as *The Squid Giant Synapse*, that concisely highlights the contributions of one such model system is a very good idea. An even better idea is to have the book written by Rodolfo Llinás, a distinguished synaptic physiologist . . . Llinás has done a good job of capturing the excitement that has kept the field of synaptic physiology energized. By its example, he Squid Giant Synapse offers a strong argument for the continued value of physiological analyses of brain function, even in these genomic times."--*Science*

"When it comes to contributing to our knowledge of neuronal function, no creature can surpass the squid. Its axon has enabled us to discover the ionic basis of electrical signalling, and its synapse has revealed the chemical signalling between neurons. Rodolfo Llinas' book summarizes what this invertebrate has told us about chemical synaptic transmission. . . . It should . . . attract a wide audience, particularly those interested in listening to nature directly rather than passively accepting current paradigms. Finally, the book comes with a CD-Rom containing an excellent program of a synaptic model. . . . This program will surely attract young students, as well as researchers, who are interested in computer simulations of neuronal function. This model also reminds us of the dynamic aspects of synaptic function and that individual neurons are not merely passive elements in neuronal networks, but actively influence brain function through synaptic modulation."--*Nature*

About the Author

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