

The Sticky Synapse

Michael Hortsch • Hisashi Umemori
Editors

The Sticky Synapse

Cell Adhesion Molecules and Their Role
in Synapse Formation and Maintenance

 Springer

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Cover illustrations: Developing Synapses - Synapses are formed at points of contact between axons and their targets. From left, *Drosophila* neuromuscular junctions (motor axons, red; muscles, green), mouse neuromuscular junctions (motor axons, green; neuromuscular junctions, pink), and mouse cerebellar synapses in culture (pontine axons, blue; cerebellar granule cell dendrites, pink; synapses, green).

Courtesy of Carrero-Martinez and Chiba (*Drosophila*) and Harris and Umemori (mouse).

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Preface

The molecular mechanisms, which are responsible for the functional differences between the various types of neuronal synapses, have become one of the central themes of modern neurobiology. It is becoming increasingly clear that a misregulation of synaptogenesis and synaptic remodeling and dysfunctional neuronal synapses are at the heart of several human diseases, both neurological disorders and psychiatric conditions. As synapses present specialized cellular junctions between neurons and their target cells, it may not come as a surprise that neural cell adhesion molecules (CAMs) are of special importance for the genesis and the maintenance of synaptic connections. Genes encoding adhesive molecules make up a significant portion of the human genome, and neural CAMs even have been postulated to be a major factor in the evolution of the human brain. These are just some of the many reasons why we thought a book on neural CAMs and their role in establishing and maintaining neuronal synapses would be highly appropriate for summarizing our current state of knowledge. Without question, over the near future, additional adhesive proteins will join the ranks of synaptic CAMs and our knowledge, and how these molecules enable neurons and their targets to communicate effectively will grow. We hope that this book will provide a comprehensive and timely synopsis of the role of CAMs at synaptic connections and will encourage other researchers to join this exciting field of neuroscience, which has the promise not only to yield new insights into the functioning of our brain but also to shed light on some devastating human diseases.

Ann Arbor, MI

Michael Hortsch
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