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Wiring the Nervous System: Mechanisms of Axonal and Dendritic Remodelling in Health and Disease

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Description:

This book examines recent key findings on the mechanisms of axonal and dendritic remodeling in different model organisms. Each chapter is contributed by a panel of experts in their respective subfields of neurosciences, to provide and discuss the latest discoveries ranging from neuronal morphogenesis during development, experience-dependent structural plasticity, to neuronal degeneration, regeneration, and pathologies in neurological disorders.

The process of neuronal remodeling, specifically their axons and dendrites,is essential for the proper wiring of the nervous system during early development and continues during postnatal ages to shape the pattern of synaptic connections throughout the life of the organism, including humans. Over recent years, substantial progress has been made in our understanding of the cellular and molecular mechanisms that control neuronal remodeling. In addition, there is accumulating evidence demonstrating how the nervous system could remodel in response to injury and in pathological conditions.

Topics discussed in the book include:

- Axonal degeneration during development and in pathological or disease conditions
- Neuronal morphogenesis (axons and dendrites)
- Experience-dependent structural plasticity to synaptogenesis
- Dendrite degeneration and regeneration

Keywords: Neuroscience, neurodevelopment, dendrite branching, axonal degeneration, synaptic connections