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BRAIN REPAIR

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Preface

The study of cellular and molecular mechanisms underlying regeneration and repair in the nervous system has become a rapidly developing field of neuroscience. The importance of this research is obvious: the clinical effects of nervous system injury and progressive degenerative disorders of the central nervous system are devastating and constitute major health care problems. In the past, research in this field has been hampered by the lack of adequate methods to study the determinants of injured nerve cell responses; the advent of novel techniques and new insights have hastened the pace of such investigations. Moreover, these studies in the injured brain and spinal cord provide important clues concerning the development and function of the intact nervous system.

The publication of the proceedings of a Wenner-Gren Center Symposium held in Stockholm in May 1989 attempts to bring together some of the most interesting recent developments in three closely interrelated fields: The role of trophic mechanisms in the regulation of neuronal survival; the regulation of axonal growth and connectivity; and the restoration of function after brain damage. Together, these experimental approaches encompass the principal components of the regenerative process, i.e., the prevention of cell death, the promotion of axonal regrowth, and the re-establishment of functional connections. The picture that emerges from such studies is one of a highly regulated series of biological events whose understanding may lead to better experimental strategies for neural repair. Whether or not a neuron dies or survives, regenerates its axon, and forms functional synapses, depends on highly precise control mechanisms at the cellular level. These control mechanisms are today amenable to study at the molecular, cellular and systems levels.

We hope "Brain Repair" gives an up-to-date account of some of the most interesting recent advances in this rapidly developing field.

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DO
January, 1990

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