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Preface

Volume 5 of the series "Advances in Research on Neurodegeneration" is concerned with themes which are currently the focus of intensive research, and in which advances in our understanding of the pathological mechanisms underlying neurodegenerative diseases are expected in the near future. The first section contains five reviews devoted to the various neuroimaging technologies. The discussion is concerned with the question of whether neuroimaging techniques make it possible to follow the process of degeneration as it occurs, and which methods offer the required sensitivity and quantifiability for this purpose. However, the question needs to be examined of whether, given the physical and chemical limitations of these techniques, even under optimal conditions, anatomical resolution can be improved to the extent that neurodegenerative diseases can be diagnosed earlier than currently possible and a confident diagnosis made. The possibilities of using neuroimaging techniques to provide information regarding the effects of neuroprotective or neuroregenerative therapeutic strategies, and for correlating the results of neuropsychological research with imaging data are also discussed.

The second section is concerned with the significance of endogenous or exogenous neurotoxins as triggers for neurodegenerative processes that may lead to Parkinsonism. Vulnerability factors, which include such factors as nerve ending sensitivity, the synergistic effects of drugs and the various mechanisms underlying different toxins are discussed.

A further important chapter considers the question of cell death; that is, programmed cell death, apoptosis and necrosis, and their respective mechanisms. Questions regarding terminology, as well as molecular biological and genetic mechanisms, are the main points of interest. The validation and limitations of neuropathological research methods, as well as possible therapeutic consequences are also discussed.

The fourth chapter is concerned with new developments in the area of immunoinflammatory mechanisms and infectious diseases which may trigger neurological diseases. Both basic experimental studies and clinically oriented research are reviewed. The focus is on multiple sclerosis and prion diseases.

The rapid publication of this volume provides the reader with an up-to-date overview of these themes in a compact form.

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Würzburg, December 1996 **P. Riederer**

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