

Preface

Because of the complexity and temporal features of the manifestation of function and structure in the nervous system, neural cells in the central nervous system (CNS) and peripheral nervous system (PNS), especially in developing brains, are typically thought to be more susceptible to toxic insults than cells in mature systems. The study of neural cell biology has great potential for helping to advance the understanding of brain-related biological processes, including neuronal plasticity, neurodegeneration/regeneration, toxicity and the efficacy of therapeutic or other interventions.

This book delineates how neural cells, systems biology, pharmacogenomic and pathophysiological approaches, as applied to neural cell biology, provide a structure around which to arrange information in a biological platform. Specific attention has been directed to some of the more recent methodologies, including genomics, proteomics and metabolomics, applied in the evolving field of neurobiology. This book also presents cross-cutting research tools and models and discusses applications involving neural stem cell system and 3D cultures that closely mimic native cellular environments. In addition, the topics of developmental neurotoxicity and risk assessment, along with the challenges and achievements in the field of neural cell biology are discussed. This book is a valuable addition to the current literature and an important reference for students, neurobiologists, pathologists, pharmacologists, and toxicologists in academia, industry and government settings.

This book provides the reader with technical background and knowledge of current test systems and models recently introduced and utilized in the study of neuronal development and neural cell biology.

Achieving the goals set forth for this book was most challenging and we wish to thank the contributing authors for conveying the excitement of recent findings and for identifying remaining knowledge gaps. We would appreciate any comments you wish to offer about *Neural Cell Biology*.

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