

PREFACE

The use of targeted cytotoxins in experimental neurobiology is a new field. This strategy involves producing highly selective neural lesions by targeting a cytotoxin into specific neurons based on their binding to surface membrane targets, such as neurotransmitter or growth factor receptors, and so on. The goal is to produce lesions of unprecedented selectivity to match the staggering complexity of the organization of the nervous system. Indeed, a considerable body of evidence exists that the expression of surface membrane molecules correlates with the function of specific types of neurons.

Molecular Neurosurgery With Targeted Toxins seeks to provide a selected collection of examples of this approach that have been implemented with great success. Included are introductory considerations and background on the toxins, followed by five chapters reviewing the use of the immunotoxin 192 IgG-saporin to lesion the cholinergic basal forebrain. This approach has been highly successful, and as pointed out by the authors, has provided a valuable animal model of Alzheimer's disease. However, it is hardly the only application of targeted toxins in neuroscience. Subsequent chapters include reviews of some of the varied uses of another immunotoxin, anti-DBH-saporin, which is used to make remarkably selective lesions of catecholaminergic neurons, and a chapter on hypocretin-saporin that can be used to produce narcoleptic animals. A variety of other saporin conjugates, such as neuropeptide-saporin conjugates, are proving valuable in pain research; these are reviewed in two chapters, followed by a chapter on the novel application of cholera toxin B chain-saporin to produce a model of CNS demyelination.

The chapter authors were asked to provide both overview perspectives and, in some cases, more practical details to enable the reader to appreciate exactly what is involved in using these agents. We, the editors, have been intimately involved in the development of the agents discussed in this volume and present this body of information as an introduction to those who would use this approach in their own experiments.

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