
Preface

Societal, ethical, and cost-related issues, not to mention the need for sound scientific methods, have led to new and/or refined methods for the evaluation of health risks associated with neurotoxic compounds. To be effective, they must be relevant and predictive of exposure, relatively inexpensive, and preferably amenable to high throughput analysis and a reduction in animal use. Ultimately, they also have to be of value to public health regulators, providing them with sound guidelines upon which to base exposure limits to adverse neurotoxic compounds. In other cases, they need to provide clues on neurotoxic mechanisms, identifying potential targets for the development of new treatment modalities.

While this book contains traditional chapters, such as those on various cell cultures which describe methods that have evolved over years, we made a valiant attempt to include also innovative approaches to neurotoxicologic testing, recognizing that the Decade of the Brain (1990–2000) has brought about a revolution in neurobiology and neurotoxicology. Accordingly, we describe how stem cells, computational biology, and other novel powerful methods can now be applied to address the challenges of neurotoxic testing.

We hope that the chapters will enlighten both the novice and the experienced neurotoxicologist and provide them with a renewed sense of the state of the art of *Neuromethods* that can facilitate the study of adverse changes in the developing and mature brain alike, addressing molecular mechanisms of neurotoxicity as well as genetic susceptibility. While for the foreseeable future, animal testing is unlikely to be completely replaced, marshaling and improving upon methods that reduce the need for animal testing will undoubtedly continue. We hope that the series of chapters compiled herein will amass a renewed wave of interest transforming neurotoxicology testing into mechanistically driven, cost-effective, and high throughput series of tests that are met by contemporary challenges.

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