Current Topics in Behavioral Neurosciences

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Current Topics in Behavioral Neurosciences provides critical and comprehensive discussions of the most significant areas of behavioral neuroscience research, written by leading international authorities. Each volume offers an informative and contemporary account of its subject, making it an unrivalled reference source. Titles in this series are available in both print and electronic formats.

With the development of new methodologies for brain imaging, genetic and genomic analyses, molecular engineering of mutant animals, novel routes for drug delivery, and sophisticated cross-species behavioral assessments, it is now possible to study behavior relevant to psychiatric and neurological diseases and disorders on the physiological level. The *Behavioral Neurosciences* series focuses on "translational medicine" and cutting-edge technologies. Preclinical and clinical trials for the development of new diagnostics and therapeutics as well as prevention efforts are covered whenever possible.

Jim J. Hagan
Editor

Molecular and Functional Models in Neuropsychiatry

Springer

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For Carole, Luke and Kate

Preface

Despite decades of research, common neuropsychiatric diseases remain enigmatic and debilitating disorders which are associated with significant human and economic costs. For example, autism and attention-deficit disorder blight the lives of the young, and schizophrenia, with its profound functional impairments, often impacts in early adulthood with devastating lifelong consequences. Major depressive disorder affects 5–9% of women and 2–3% of men and, according to the World Health Organization (WHO), about 4% of the world's population suffers from some form of drug abuse disorder.

The development of more effective treatments for these and other neuropsychiatric disorders requires scientific progress on a broad front. Animal models have a vital role to play in advancing the field. When deployed in conjunction with detailed study of these diseases in man, they bring the power to make controlled experimental interventions, which allow the functional consequences of genetic variations and polymorphisms to be understood in terms of their cellular systems and behavioural effects. Further, they provide a means by which complex cognitive and behavioural phenomena may be dissected and understood. Finally, they provide a bridge to understanding the effects of drugs on the functioning of the central nervous system, thereby improving our understanding of the actions of those drugs in man.

This volume discusses some of the latest and most exciting advances. The selection of topics eschews the conventional approach of organizing material by discipline, focusing instead on more eclectic, multidisciplinary approaches. It reflects a personal perspective of those areas in which exciting and important new developments are taking place. These span the established areas of study, reflecting both technical and theoretical advances, but also encompass emergent areas such as the use of MRI in the study of systems responses, epigenetic regulation and gene/environment interactions, all topics which will surely play an increasing role in the scientific discourse related to neuropsychiatric diseases.

It is over 60 years since Pauling (Pauling et al. 1949) elucidated the notion of molecular medicine in the context of sickle cell anaemia. The coming decades must see the concept firmly embedded in the practice of neuropsychiatric medicine if the

much needed improvements in therapy are to be delivered. The work discussed in this volume shows some of the ways in which this vision is being realized.

I am grateful to the authors, all leaders in their fields, who so willingly devoted their time, energy and expertise to share their research perspectives and produce a volume which I hope will inform and excite students and experts alike.

February 2011 Jim J. Hagan

Reference

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