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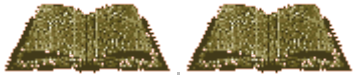

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A HIGHLY PRACTICAL, STATE-OF-THE-ART VOLUME

Drugs of Abuse - Neurological Reviews and Protocols, 1st Edition, *edited by* John Q. Wang Hardcover, 6" x 9".
Humana Press Inc., 999 Riverview Drive, Suite 208, Totowa, New Jersey 07512. Publication Date 10 December, 2002. xiv + 514 pages, ISBN 1-58829-057-3 (acid-free Paper). Price $135.00

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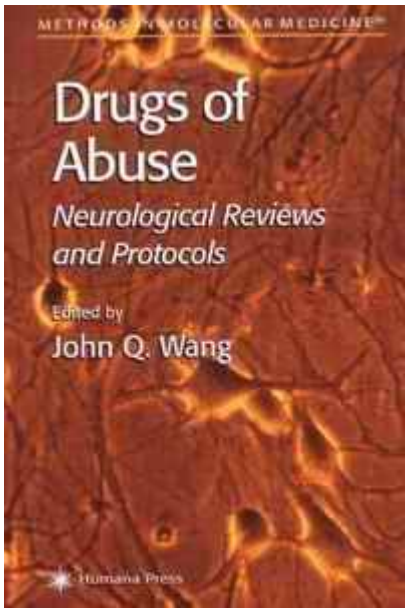

Publisher's Blurb

New molecular technologies have transformed our understanding of the neurological impact of drugs of abuse and opened many new possibilities for research. In *Drugs of Abuse: Neurological Reviews and Protocols* leading scientists from all over the world review these novel research areas and provide a cutting-edge collection of updated and core techniques for the neurological study of drugs of abuse. Described in step-by-step detail, these readily reproducible protocols cover a wide variety of coherent methods for gathering information on quantitative changes in protein and mRNA at both tissue and cellular levels. There are various methods for detecting single and multiple alterations in single and multiple gene expression, for analyzing the functional roles of genes and proteins, for studying the release kinetics of striatal dopamine, and for the quantitative measurement of such neurotransmitters as acetylcholine. Additional methods are provided for primary neural cell culture preparation, for an immunohistochemical method to examine cellular proliferation and differentiation, and for a culture method to grow viable neural progenitors. All contributors have considerable experience with the protocols covered, and each protocol has been thoroughly tried and successfully tested in the laboratory. Helpful notes for each method discuss tricks-of-the trade, pitfalls to avoid, and troubleshooting.

State-of-the-art and highly practical, *Drugs of Abuse: Neurological Reviews and Protocols* offers insightful reviews of key current topics and a core collection of readily reproducible techniques essential for any neurobiological laboratory carrying out either basic analyses or seeking novel research approaches.

View this book on Amazon

Molecular biology is a field that is growing by leaps and bounds, revolutionizing progress in several areas of scientific research. Toxicology is no exception and has received tremendous boost in recent times owing to the evolution of new molecular technologies that have transformed our understanding of the exact ways in which drugs and poisons act. The book under review explores the neurological ramifications of several drugs of abuse at a molecular level by the employment of such cutting edge scientific technologies. The book forms part of a series - "Methods in Molecular Medicine," and remains faithful to the format of earlier volumes in the series. Leading scientists

have contributed novel research protocols in meticulous detail that are easily comprehensible and reproducible. They cover a wide range of studies on protein and mRNA at both tissue and cellular levels.

Over the preceding ten years or so, hectic work has been undertaken by investigators on inducible gene expression in striatal neurons. Changes in gene expression for a large variety of proteins in the striatum have been studied in response to drug administration. It is well known that long-term addictive properties of many drugs of abuse result in the development of neuroplasticity as a consequence of altered expression of certain mRNAs and their product proteins.

Conents

& Part I: Special Reviews
& Part II. Detection of mRNA Expression in the Striatum
& Part III. Detection of Protein Expression in the Striatum
& Part IV. Gene Function Analysis
& Part V. Striatal Culture Preparation
& Part VI. Detection of Transmitter Release in the Striatum
& Part VII. Behavioral Assessment and Others Index.

The book describes the numerous labeling methods by which gene expression can be detected in cell phenotypes. In fact, the expression of multiple genes of interest can be detected in a single cell simultaneously. The recent advent of microarray screening technology has now made it possible to detect thousands of gene expression products in a single experimental setup.

Protocols are also included in the book for studying the release kinetics of striatal dopamine, and for the quantitative measurement of neurotransmitters such as acetylcholine. These are highly relevant areas of research. For instance, it is well known that striatal dopamine is a prime brain transmitter that interacts with common psychostimulant drugs of abuse such as amphetamine and cocaine. As far as acetylcholine is considered, there is increasing evidence that it has an important role to play in the control of drug actions.

Other useful protocols contained in the book include those which help in analyzing the functional roles of genes and proteins, for example, antisense strategy, knockout mice, and viral-mediated gene transfer. There are also very topical protocols on immunohistochemical methods of examining cellular proliferation and differentiation in the adult rodent brain, along with methods of culture to grow viable neural progenitors. All protocols have been prepared by highly qualified investigators with considerable research experience, and have been thoroughly tried and tested in the laboratory. At the end of each article is a final section of Notes, which discusses matters relating to pitfalls and troubleshooting.

QUICK NOTES

& State-of-the-art techniques for studying the neurobiology of drugs of abuse
& Insightful reviews of key current topics in the effect of drugs of abuse on the brain
& Detailed step-by-step instructions to ensure successful experimental results
& Broad coverage ranging from behavioral analysis to genomic study

A feature of particular interest to this reviewer is the protocol dealing with primary neural culture preparation for studies on intracellular signaling pathways and gene expression. These cultures represent an easily controlled model for the study of cellular events associated with drug's actions. It is certain that the success of the neural culture model will further spur molecular research into drugs of abuse.

In conclusion, this book is a highly practical, state-of-the-art volume of thought provoking reviews and innovative, easily reproducible protocols which are indispensable to any neurobiological laboratory undertaking basic or advanced research studies. Illustrative data have been provided wherever necessary so that investigators will have the advantage of comparing these with their own results from the first run of a protocol. The book comprising 35 meticulously prepared chapters involving the contributions of more than 45 highly qualified researchers, edited impeccably by John Q. Wang is, in the opinion of this reviewer, a jewel in the crown of neurological research into drugs of abuse.

-V.V.Pillay



Dr. Pillay is one of the foremost exponents of toxicology in the Asian continent. He has authored two books on toxicology, besides a Comprehensive textbook on Forensic Medicine. His books on toxicology include the bestseller "Pocketbook of Pesticide Poisoning for physicians". He is currently the Chief of Poison Control Centre, at the Department of Forensic Medicine & Toxicology, Amrita Institute of Medical Sciences, Cochin - 682 026. He is the Chief Reviewer of Best Toxicology Books.

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