

Introduction to Neuropsychopharmacology

by Leslie L. Iversen, PhD; Susan D. Iversen, PhD; Floyd E. Bloom, MD; and Robert H. Roth, PhD. Oxford University Press, New York, NY, 2009, 557 pages, \$45.00 (paper).

Neuropsychopharmacology is that branch of neurosciences devoted to the study of drugs that affect nervous tissue and alter behaviors...

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With new authors and a revised title, this is essentially the ninth edition of a classic introductory textbook of neuropsychopharmacology. It first appeared in 1970 and continued through 8 editions, to 2002, as *The Biochemical Basis of Neuropharmacology* by Jack R. Cooper, PhD (Yale University), Floyd E. Bloom, MD, and Robert H. Roth, PhD—initially a Yale University–based collaborative effort. The new edition includes Drs Leslie and Susan Iversen, professors of pharmacology and experimental psychology, respectively, at Oxford University. Addition of the new co-authors greatly expands expertise in laboratory neuropharmacology as well as industrial drug development (Leslie Iversen) and animal behavioral methods (Susan Iversen) traditionally used to evaluate effects of chemical agents on the central nervous system (CNS). At its inception, this was the first and arguably the only textbook on this topic, appearing when neuropsychopharmacology was a relatively new and emerging branch of the field only then becoming known as “neuroscience.” The history of the book closely parallels that of its science, progressing from a new and limited topic of scientific inquiry to a rich and complex field that challenges the authors to summarize adequately in 557 pages (150 more than in the eighth edition).

A particular charm of the book continues to be its masterly and efficient communication of complex concepts in way that is understandable and even compelling to students, trainees, and nonexperts as well as worthy of the attention of experienced

investigators. This characteristic reflects the status of the authors as international leaders in their fields, with decades of research and academic experience in neuropsychopharmacology. The book also involves noteworthy economy of means, with text, line drawings and diagrams, chemical structures, and a highly selective bibliography. These choices limit access to relatively expensive visual depictions of fruits of modern neurohistology and neuroradiology, but support the accessibility of the book as well as its relatively modest price. As in previous editions, this textbook is strongest in its coverage of basic neuropharmacology, with an emphasis on the biochemical organization and physiology of chemical neurotransmission at synapses, through receptors and post-receptor molecular-response subsystems. This emphasis parallels developments and theorizing in CNS drug development as well as in biological theories concerning psychiatric and neurological disorders.

The basic neuroscience reviewed in the book continues to advance and expand apace. The science has been strongly stimulated by academic and industrial development of novel drugs, whereas one might expect such advances in neuroscientific theory, instead, to stimulate drug-development and to lead more or less directly to improved clinical treatments. Paradoxically, however, the rate of introduction of novel and improved psychotropic and neurotropic drugs has slowed considerably in recent years. Moreover, many newer CNS drugs are similar chemically or in their action mechanisms to agents known and used clinically for many years, and discovered largely by serendipitous or largely accidental clinical observation rather than arising from pharmacological theory. Another limitation is that ever-greater numbers of novel macromolecules and their genes have been identified, but with still limited knowledge of their physiological roles in the brain and on behavior or their potential roles in pathological nervous systems that might serve as bases for drug development.

In other words, the value and power of the advancing state of the science of neuropsychopharmacology, as summarized in this book, is strikingly at variance with the development of novel clinical treatments. It can be argued that a fundamental limitation on therapeutic innovation is imposed by the continued lack of plausible pathophysiological (let alone etiological) theories of the basis of most CNS disorders and nearly all essentially symptomatic and descriptive psychiatric syndromes. Ironically, most modern hypotheses concerning a pathophysiology of major mental and some neurological illnesses can be considered essentially “pharmacocentric” or logically circular speculations, arising from dubious, or at least incomplete, speculations that the opposite of known actions of drugs that are effective in a condition may be a clue to its causes. Examples include the norepinephrine and serotonin deficiency hypothesis in major depression and the dopamine-excess speculation for mania or psychotic disorders.

Nevertheless, growing understanding of mechanisms of action (pharmacodynamics) of known CNS drugs has served as a powerful stimulus to advancing the neurobiology summarized in this book. It seems fair to propose that knowledge of synaptic biochemical transmission in the CNS is necessary for understanding the actions of most known psychotropic or neurotropic drugs. However, this conclusion does not support speculation that such mechanisms are sufficient to guide discovery and development of innovative and improved drugs. Moreover, it can be argued that the disparity between knowledge of actions of drugs discovered largely by accident in the 1950s and 1960s and a lack of compelling biological theories for most psychiatric and many neurological disorders is the central problem for contemporary CNS drug development.

It is important to make clear that this is not a book on introductory psychiatric or neurological therapeutics. Indeed, the least well developed aspects of the book pertain to clinical

treatment—a decision consistent with providing a broad and credible overview of the basic scientific underpinnings of neuropsychopharmacology. The book does address some aspects of treatments for major psychiatric syndromes and selected neurological or neuropsychiatric disorders, including dementia and some movement disorders, as well as aspects of substance-abuse disorders, and is particularly relevant to understanding known actions of available psychotropic drugs. The book remains one of the most readable and reliable introductions to the basic,

preclinical science of neuropsychopharmacology. The addition of new authors offers hope that this classic may continue into further editions.

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