

Book review

Neurosteroids: A New Regulatory Function in the Nervous System, edited by Etienne-Emile Baulieu, Paul Robel and Michael Schumacher, Humana Press, New Jersey, 1999. ISBN 0-89603-545-X, pp. 378, recommended price \$135.00, £110.00.

Over the last 10 years, literature on neurosteroids has demonstrated the growth of an ingenious hypothesis into a major field of research with promising clinical applications. This new book, edited by the person who first demonstrated the existence of neurosteroids and his colleagues, brings the reader up to date on the importance of these biological molecules. The research reviewed here explains how centrally-synthesized steroids interact with the GABA_A, glutamate, and acetylcholine receptors, as well as a variety of other brain systems to affect behaviour, stress, memory and aging. The book covers a wide range of research areas relevant to neurosteroids, including genomic and non-genomic actions of neurosteroids, pharmacology of neurosteroids and their receptors, and a role for neurosteroids in brain plasticity. Contributors include many of the leading researchers in their fields (e.g., M.D. Majewska, B.S. McEwen, and the editors themselves), and chapter content ranges from comprehensive reviews of established conclusions (e.g., S.H. Mellon and N.A. Compagnone's chapter on neurosteroid-synthesizing enzymes) to intriguing hypotheses about evolving research areas (e.g., E. Roberts' chapter on the memory-enhancing effects of pregnenolone sulphate). Besides these two remarkably accessible and interesting chapters, R.H. Purdy and S.M. Paul's chapter on GABAergic neurosteroids is notable for its thorough and thought-provoking review of the relevant research. Though some reference is made to clinical research, what is reviewed in this book is primarily basic research, complementing the more applied focus of the 1996 book edited by A.R. Genazzani, F. Petraglia and R.H. Purdy 'The Brain: Source and Target for Sex Steroid Hormones' (Parthenon Publishing Group, New York). Further, this new book discusses in detail the mechanisms of action (and proposed mechanisms of action) of neurosteroids at their various receptors, an area of research which was far less well understood at the time of publication of the 1996 book.

Neurosteroids is promoted as being targeted to 'neurobiologists, endocrinologists, psychiatrists, neurosurgeons, pharmacologists, and geriatricians.'¹ However, the lack of inclusion of clinical work and the often-detailed biochemistry and molecular pharmacology makes it unlikely the book will appeal to such a wide audience. More properly the book is for those basic and clinician scientists who work in the field and to those entering it who want access to up to date information and references. The book would be an excellent resource for graduate students and would serve as a very useful text for a graduate course on brain steroids.

As in any relatively new field, neurosteroid researchers grapple with the development of a common and accessible language. In steroid chemistry the problem is compounded because the structures and names of molecules seem very similar yet their biology can be profoundly different. The fact that most of the substitutions at each position on the molecules can result in 2 isomers poses a formidable challenge for those not immersed in the field. To make matters worse, some of the molecules have popular names for the polysyllabic proper chemical names. Since the connotation and denotation of the popular names is often misunderstood, confusion can easily arise. To assist in standardization, very useful tables are included at the beginning of this book listing the relevant steroids and enzymes with both their 'used' and 'not to be used' abbreviations. Unfortunately, however, not all of the contributors chose to follow the editors' lead here: the chapters reflect the inconsistent naming that is all too prevalent in the literature. Some of these inconsistencies might have been picked up with more careful copy editing which might have also spotted the surprisingly prevalent typographical errors.

In the first chapter, the editors propose a precise definition for neurosteroids as steroids 'which can be synthesized *de novo* in the nervous system from sterol precursors.' This, however, excludes estrogens, since they are synthesized primarily from peripheral testosterone. The inclusion of several (very informative) chapters that deal with these estrogenic steroids specifically is at

¹See www.humanapress.com/humana/.

least inconsistent. Perhaps the book would have been more aptly entitled 'Neuroactive and Neurosteroids' indicating that the scope of the book includes consideration of peripherally synthesized steroids which have important neural activity. Regardless of the title, this book presents the essence of a decade's worth of research in an exciting new field. Notwithstanding some inconsistencies and other minor problems with the book, it is the best consolidated source available for researchers in the area. The recommended price of \$135 is quite typical for a specialized multi-authored text.

The importance of steroids for behavior has been recognized for over 50 years. In light of the progress that this book records, it is perhaps surprising that the

field has not moved farther in the direction of clinical applications. Increasing attention to sex based differences in drug responses (particularly psychoactive drugs) will likely stimulate research into the role of neuroactive hormones and neurosteroids and how they contribute to this type of variation. Therapeutic advances have not yet come from this field. When they do come, however, they are likely to be of significant benefit to women in particular.

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