

computational techniques in analogue finding or optimisation is almost completely neglected.

The second part of the book, which gives a plethora of case studies from very different therapeutic areas and target families, is the most valuable part. It can serve as a rich source of examples in analogue-based drug design. Examples are given for structural analogues as well as for pharmacological analogues. Different aspects of analogue-based drug design are covered by examples. For instance, the chapters on opiates or corticosteroids show the use of natural products as starting points for analogue-based drug design. A detailed history of this strategy is outlined for beta-blockers, while other examples illustrate that in vivo observations can initiate the development of new drugs, such as the discovery of cisplatin and drospirenone. Analogue optimisation under constraints of pH stability and pharmacodynamics is exemplified by proton-pump inhibitors.

Some contributions focus on the pharmacological aspects of the different compounds discussed instead of clearly emphasising the strategy that was finally successful. Lessons learnt from the case studies could have been given more clearly.

Overall the book is of interest for medicinal chemists who already have a sound knowledge of aspects of analogue-based drug design.

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## Neurobiology of DOPA as a Neurotransmitter

Edited by Yoshimi Misu and  
Yoshio Goshima.

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The book *Neurobiology of DOPA as a Neurotransmitter*, edited by Yoshimi Misu

and Yoshio Goshima, focuses on the neurobiological aspects of L-3,4-dihydroxyphenylalanine (DOPA), a non-proteinogenic amino acid. Most scientists as well as some in the general public recognize this amino acid as crucial in the treatment of neurological disorders, particularly Parkinson's disease. In this respect, DOPA was long thought to serve only as a neurologically inert precursor, which is enzymatically transformed to dopamine (dihydroxyphenylethylamine). Dopamine itself was regarded as a preeminent neurotransmitter, and a large part of research in the field of neurobiology concentrated on this neuroactive substance. The role of DOPA itself has only recently come to the focus of attention, and the present book presents a timely overview of the different aspects of this amino acid in neurotransmission.

The scientific concepts, perspectives, and studies are presented in 22 chapters, each written by one or several experts in their field. These chapters are grouped into five parts, describing the history (part I), biosynthesis and metabolism (part II), release (part III), pharmacology (part IV) and neurotoxicology (part V) of DOPA in all its aspects.

In the first part, an excellent historical overview of DOPA is given by a pioneer in the discovery of the role of dopamine and DOPA in the treatment of Parkinson's disease, Oleh Hornykiewicz (Medical University of Vienna). The chapter describes the developments starting with the first synthesis in 1911 by Funk, the discovery of DOPA decarboxylase, and the suggestion of the biosynthetic metabolism (L-Tyr → DOPA → dopamine → noradrenaline → adrenaline) to the discovery of the role of dopamine/DOPA for effective treatments of Parkinson's disease starting in the late 1950s. Most significantly, the shift of the recognition of DOPA from an 'inert precursor' to a neurologically active substance in its own right is carefully laid down.

This paradigm change is then carefully taken up by two pioneers in the field, the editors Yoshimi Misu and Yoshio Goshima. In the following chapters they describe the early evidence of DOPA as a

neurotransmitter candidate and the uptake of DOPA in the CNS. Three chapters carefully detail the various aspects of the release of DOPA and the experimental characterization of these processes. The major part of the book deals with the pharmacology of DOPA; 10 chapters describe various aspects such as DOPA recognition, physiological responses, behavioral and modulatory effects, and the role of DOPA in relation to other neurotransmitters.

Clearly, a book written by over 40 leading experts sometimes suffers from overlap between chapters and from detailed descriptions of fractions of the vast research on DOPA. The editors did structure the book in a logical and comprehensive way, and the overlap is thus minimized. Some chapters are written in a cutting-edge-research descriptive style, and others reflect critical and fundamental findings on the complex biology of DOPA. This comprehensive overview of the recent developments of DOPA as a neurotransmitter is a must-read for every neuroscientist working on endogenous neurotransmitters. In particular, the chapters on pharmacology and neurotoxicology are written by experts for experts. In addition, the introductory chapters provide an overview regarding the neurobiology of DOPA and thus provide interesting aspects to any researcher working on this amino acid. As DOPA is involved in many other different biological functions such as melanogenesis, as an intermediate for many other biologically active molecules, and also as a key amino acid in mussel adhesive proteins, scientists from such different fields as natural products chemistry, biochemistry, and even materials science will find it an interesting read.

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