Handbook of Psychopharmacology

Volume 16

Neuropeptides

Edited by
Leslie L. Iversen
Susan D. Iversen
and Solomon H. Snyder

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PREFACE

It is now eight years since the first *Handbook* volumes on Basic Neuropharmacology were published, and there have been many important advances. As in many other areas in science, progress in this field has depended to a considerable extent on the availability of new experimental methods, and Volume 15 reviews some major recent developments, including new autoradiographic techniques that allow direct visualization of drug and transmitter receptors in the nervous system, and the pinpointing of the precise locations of the changes in brain metabolism elicited by various drug treatments. Volumes 16 and 17 cover two of the most active areas for basic research in psychopharmacology at the moment: the characterization of drug and transmitter receptors in brain by radioligand binding techniques, and studies of the role of small peptides in brain function. The latter area, in particular, illustrates how rapidly progress continues to be made in basic research on the mechanisms of chemical communication within the nervous system. Eight years ago when the *Handbook* first appeared none of the opioid peptides (enkephalins and endorphins) had yet been identified. Since then a whole new area of basic biological research has focused on these substances, and in addition we know of more than thirty other neuropeptides with putative CNS transmitter functions.

We hope that these new volumes will help to keep the *Handbook of Psychopharmacology* abreast of the most recent advances in the field, and continue to make it a valuable reference work for all who are involved in research in this increasingly active field of science. The response to earlier volumes has been remarkably positive, and we remain indebted to the publishers for conceiving the original idea, and to the many contributors who have labored long and hard to bring it to fruition.

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Handbook of
Psychopharmacology

SECTION I: BASIC NEUROPHARMACOLOGY

Volume 1	Biochemical Principles and Techniques in Neuropharmacology
Volume 2	Principles of Receptor Research
Volume 3	Biochemistry of Biogenic Amines
Volume 4	Amino Acid Neurotransmitters
Volume 5	Synaptic Modulators
Volume 6	Biogenic Amine Receptors

SECTION II: BEHAVIORAL PHARMACOLOGY IN ANIMALS

Volume 7	Principles of Behavioral Pharmacology
Volume 8	Drugs, Neurotransmitters, and Behavior
Volume 9	Chemical Pathways in the Brain

SECTION III: HUMAN PSYCHOPHARMACOLOGY

Volume 10	Neuroleptics and Schizophrenia
Volume 11	Stimulants
Volume 12	Drugs of Abuse
Volume 13	Biology of Mood and Antianxiety Drugs
Volume 14	Affective Disorders: Drug Actions in Animals and Man

SECTION IV: BASIC NEUROPHARMACOLOGY: AN UPDATE

Volume 15	New Techniques in Psychopharmacology
Volume 16	Neuropeptides
Volume 17	Biochemical Studies of CNS Receptors

CONTENTS

CHAPTER 6

Neurotensin and Bombesin

CHARLES NEMEROFF, DANIEL LUTTINGER, and ARTHUR J. PRANGE, JR.

CHAPTER 7

Extrahypothalamic Distribution and Action of Hypothalamic Hormones

MIKLÓS PALKOVITS and MICHAEL J. BROWNSTEIN

1

SUBSTANCE P IN THE NERVOUS SYSTEM

T. M. Jessell

1. INTRODUCTION

The properties of a vasodepressor substance extracted from brain and intestine and originally called preparation P were first described by von Euler and Gaddum in 1931. Fifty years later, it is certain that substance P must play an important role in nervous system function, yet it is surprisingly difficult to cite a single physiologically relevant action of substance P, supposedly the doyen of the common peptides (Pearse, 1978). In contrast, the physiological role of many other neuropeptides and releasing hormones that have been discovered more recently is now well established.

There are several possible reasons for the comparatively slow progress in defining the role of substance P in the nervous system. Although many of the actions and chemical properties of substance P had been established by von Euler and Gaddum (1931), it took 40 years before it was eventually isolated (Chang and Leeman, 1970) and its amino acid sequence determined (Chang *et al.*, 1971) (Fig. 1). Leeman and her co-workers then prepared synthetic substance P (Tregear *et al.*, 1971) and subsequently generated the first anti-substance P antibody (Powell *et al.*, 1973). It is this series of studies that has proved fundamental in generating a renewed

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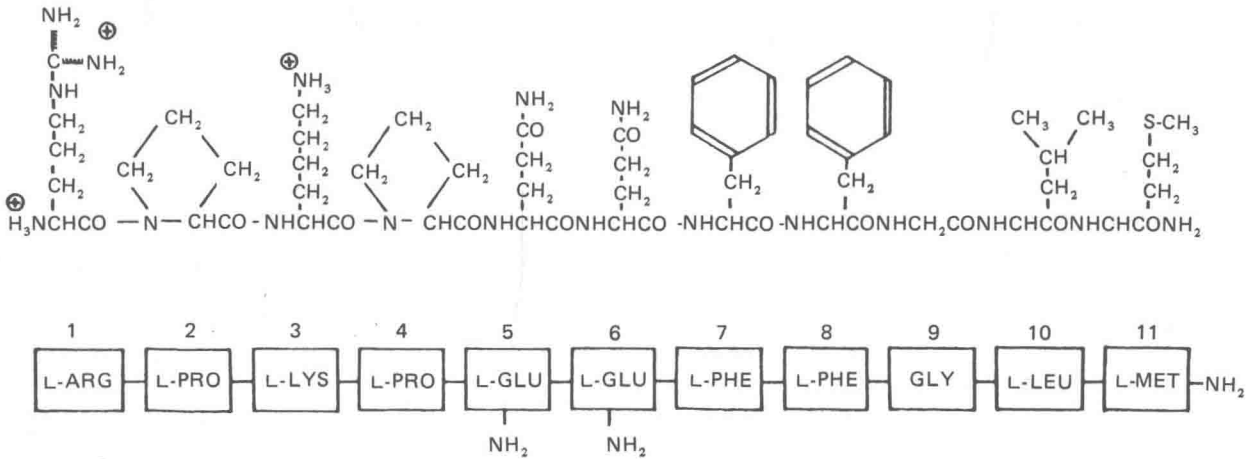

FIG. 1. Amino acid sequence of substance P. (From Skrabanek and Powell, 1977.)