

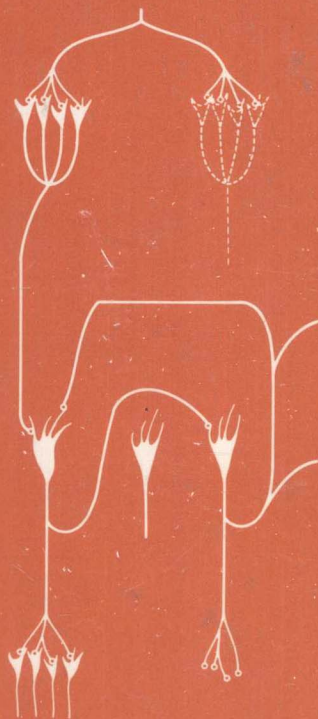
Psychopharmacology and Biochemistry of Neurotransmitter Receptors

Editors:

Henry I. Yamamura

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Developments in Neuroscience

Volume 11

ELSEVIER/NORTH-HOLLAND

PSYCHOPHARMACOLOGY AND BIOCHEMISTRY OF NEUROTRANSMITTER RECEPTORS

Proceedings of an International Conference held on April 11-13, 1980 in Tucson, Arizona, U.S.A.

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ELSEVIER/NORTH-HOLLAND
NEW YORK • AMSTERDAM • OXFORD

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Published by:

Elsevier North Holland, Inc.
52 Vanderbilt Avenue, New York, New York 10017

Sole distribution outside of the United States and Canada:

Elsevier/North-Holland Biomedical Press
335 Jan van Galenstraat, P.O. Box 211
Amsterdam, The Netherlands

Library of Congress Cataloging in Publication Data

Conference on the Psychopharmacology and Biochemistry of Neurotransmitter
Receptors, Tucson, Ariz., 1980. Psychopharmacology and biochemistry of
neurotransmitter receptors.
(Developments in neuroscience; v. 11)

Bibliography: p.

Includes index.

1. Psychopharmacology — Congresses. 2. Neurotransmitter receptors —
Congresses. I. Yamamura, Henry I. II. Olsen, Richard W. III. Usdin,
Earl. IV. Title. V. Series.

RM315.C62 1980 615'.78 80-24356

ISBN 0-444-00568-4

0-444 80028-X (Series)

Manufactured in the United States of America

PSYCHOPHARMACOLOGY AND
BIOCHEMISTRY OF
NEUROTRANSMITTER RECEPTORS

DEVELOPMENTS IN NEUROSCIENCE

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- Volume 11 — Psychopharmacology and Biochemistry of Neurotransmitter Receptors, edited by Henry I. Yamamura, Richard W. Olsen and Earl Usdin, 1980

PREFACE

This meeting brings together an outstanding group of contributors to the field of neurotransmitter receptors. The abundant progress in biochemical investigations on peripheral nervous system receptors in skeletal, smooth, and cardiac muscles, erythrocytes, and cells grown in culture, so well described at this symposium, is now increasingly being applied to problems of the more complex central nervous system.

Elegant studies on the protein components and subunits of various peripheral receptors, some analyzed with the new technique of monoclonal antibodies, have resulted in a considerable narrowing down of the possible models for neurotransmitter and drug action at the molecular level. Likewise, an explosion of information about central nervous system receptors for neurotransmitter and psychoactive drugs suggests imminent breakthroughs in the field of mental and nervous system disease are likely.

Two of the most striking concepts emerging from the meeting were the following: First, there is a heterogeneity of receptors for every neurotransmitter. This probably involves both multiple classes of discrete receptors plus multiple states for each class of receptors. Whichever of the several possible explanations accounts for the receptor heterogeneity, this added complexity must be sorted out for each receptor, whether one is interested in functional, pharmacological, or pathological aspects.

Second, neurotransmitter receptors are regulated in both the up and down direction, and on both rapid and slow time scales. These mechanisms of regulation undoubtedly have major importance in both normal and diseased nervous system function. One likely mechanism involves interconversion of the multiple states of receptors mentioned above, with levels of low and high affinity states determined by the past or recent history of the synapse. Hopefully, the studies described in this book will stimulate rapid development in the neurosciences.

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ABBREVIATIONS

AcCoA = acetyl coenzyme A	EAMG = experimental autoimmune myasthenia gravis
AcCh = Ach = acetylcholine	EDTA = ethylene diamine tetraacetic acid
AChR = acetylcholine receptor or cholinergic receptor protein	EEG = electroencephalogram
ADP = adenosine diphosphate	EGTA = ethyleneglycol-bis (β -aminoethyl ether)-N,N'-tetraacetic acid
ADTN = 2-amino-6,7-dihydroxy-1,2,3,4-tetrahydronaphthalene	EM = electron microscopic
AMP = adenosine monophosphate	ENK = enkephalin
ANOVA = analysis of variance	EPI = epinephrine
AOAA = aminooxyacetic acid	EPS = extrapyramidal symptoms
APO = apomorphine	eu = entropy units
ATP = adenosine triphosphate	
BgTx = bungarotoxin	FC = frontal cortex
BR = benzodiazepine receptor	FNPA = 4-fluoro-3-nitrophenylazide
BS = brain stem	FNZP = flunitrazepam
BuTx = bungarotoxin	
BZD = benzodiazepine	
cAMP = c-AMP = cyclic AMP	GABA = γ -aminobutyric acid
CAT = choline acetyltransferase	GABA-T = GABA transaminase
CB = cerebellum	GAD = glutamic acid decarboxylase
CBB = Coomassie brilliant blue	GAG = γ -acetylenic GABA
CD = <u>cis</u> -methyldioxolone	GDP = guanosine diphosphate
CF = climbing fiber	GF/B = glass fiber filters
cGMP = cyclic GMP	GMP = guanosine monophosphate
Ch = choline	Gpp(NH)p = guanylimidodiphosphate
2 CLADO = 2-Chloroadenosine	GPPNP = 5'-guanylimidodiphosphate
CLN = CLO = clonidine	GTP = guanosine triphosphate
CNS = central nervous system	
CoA = coenzyme A	HA = histamine
CS = corpus striatum	HAL = haloperidol
CSF = cerebrospinal fluid	HAT = hypoxanthine + aminopterin + thymidine
CSM = crude synaptic membranes	HATS = high affinity transport system
CTP = cytosine triphosphate	HD = Huntington's Disease
Ctx = cortex	H ₁₂ HTX = perhydro-HTX
DA = dopamine	HPLC = high performance liquid chromatography
dATP = deoxyadenosine triphosphate	5-HT = serotonin
dcAMP = deoxycyclic AMP	5-HTP = 5-hydroxytryptophan
DHA = dihydroalprenolol	HTX = histrionicotoxin
DHEC = dihydroergocryptine	
DHP = α -dihydropicrotoxin	ICV = intracerebroventricular
DMBB = dimethyl butyl barbiturate	IHYP = iodohydroxybenzylpindolol
DMI = desmethylinipramine	INH = isonicotinic acid hydrazide
Dod SO ₄ = dodecyl sulfate	I _{pi} = phasically active inhibitory neuron
DOPA = Dopa = dihydroxyphenylalanine	ISH = interspike interval histogram
DPH = diphenylhydantoin	I _i = inhibitory neuron
dtc = d-tubocurarine	ITP = inosine triphosphate

- LA = left atrium
 LPO = lactoperoxidase
 LSD = lysergic acid diethylamide
 LV = left ventricle

 MAO = monoamine oxidase
 MBTA = 4-(N-maleimido)benzyl-
 monium iodide trimethylam
 MG = myasthenia gravis
 MOPEG-SO₄ = 3-methoxy-4-hydroxy
 phenylethyleneglycol sulfate

 NAD = nicotinamide adenine dinucleotide
 NAP = nitroarylazidophenyl
 NB = neuroblastoma
 NE = norepinephrine
 NPA = N-n-propylnorapomorphine
 NTP = nucleotide triphosphate

 6-OH-DA = 6-OHDA = OH-DA = 6-hydroxy-
 dopamine

 P = principal (or, pacemaker) neuron
 PAC = p-aminoclonidine
 PD = Parkinson's Disease
 PDH = pyruvate dehydrogenase
 PGE₁ = prostaglandin E₁
 PTA = phenyltrimethylammonium
 PTZ = pentylenetetrazol

 QNB = quinuclidinyl benzilate

 RA = right atrium
 RV = right ventricle

 S = excitatory satellite neuron
 S.B. = specific binding
 SDS = sodium dodecylsulfate
 SEP = intraventricular septum
 SHR = spontaneously hypertensive rats
 SP = substance P
 Spi = SPIP = spiroperidol = spiperone
 SRS = solubilized recognition sites

 t_A = toxin binding site, anesthetic-
 binding
 TDF = phenyltrimethylammonium diazonium fluoro-
 borate
 TEAN = EDTA + ascorbic acid + nialamide
 TETRAL = 2-(N,N-dipropyl)amino-5,6-dihydroxy-
 tetralin
 TETS = tetramethylene disulfotetramine

 THIP = 4,5,6,7-tetrahydroisoxazole
 (5,4 - c)pyridone-3-ol
 t_m = toxin binding site blocked by MBTA
 Tris = tris (hydroxymethyl)amino methane

 UTP = uridine triphosphate

 VMT = ventromedial tegmental

 WKY = Wistar-Kyoto (rats)
 YOH = yohimbine

ACKNOWLEDGMENTS

First and foremost we should like to acknowledge with thanks the support - both fiscal and philosophical - of the University of Arizona College of Medicine. Next, the Organizing Committee of the Conference on the Psychopharmacology and Biochemistry of Neurotransmitters should like to acknowledge with thanks support from the following:

Astra Lakemedel
Burroughs Wellcome
Ciba-Geigy
Elsevier-North Holland
Hoechst-Roussel
ICI Americas
Janssen Pharmaceutica
Lederle Labs.
McNeil Labs.
Mead Johnson & Co.
Merrell Research Center
Merck & Co.
New England Nuclear
Ortho Pharmaceutical Co.
Pfizer, Inc.
Roche Laboratories
A.H. Robbins
Sandoz, Basle
Sandoz, Inc.
Smith Kline & French
Synthelabo

We are indebted to the post-docs and graduate students in Dr. Yamamura's laboratory for their help at the meeting. The following Arizonans performed yeoman tasks: Marla Bliss, Andy Chen, Jim Davidson, Cathy Thomas and last, but far far from least, Susan Yamamura. In planning the meeting, Ann Olsen and Jessica Summers of the University of California at Riverside gave invaluable help. At the National Institute of Mental Health, Ellen Perella provided the expertise and excellence which she has given to the preparation of so many meetings and so many volumes of proceedings.

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PART I

Acetylcholine Receptors and Ion Channels

