Adrenergic Receptors: Molecular Properties and Therapeutic Implications

Editors:
Robert J. Lefkowitz
Elke Lindenlaub

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Abbreviations Used in This Volume

A	= active
ABTS	= 2,2′-azinodi-3-ethyl-benzthiazoline sulfonic acid
ACHR	= acetylcholine receptor
ADP	= adenosine diphosphate
Adr	= adrenaline
AHO	= Albright's hereditary osteodystrophy
ALP	= alprenolol
αMN	= α-methylnoradrenaline
AMP	= adenosine monophosphate
Ang	= angiotensin
Arg	= arginine
aR_s	= pure β-adrenergic receptor
ATP	= adenosine triphosphate
AVP	= arginine vasopressin
B	= binding
βAR	= β-adrenergic receptor
$βAR_D$	= degraded form of the β-adrenergic receptor
$βAR_L$	= lost form of the β-adrenergic receptor
$βAR_{LV}$	= light vesicle (internalized) form of the β-adrenergic receptor
$βAR_N$	= native form of the β-adrenergic receptor
$βAR_U$	= uncoupled form of the β-adrenergic receptor
BHT 920	= (2-amino-6-allyl-5,6,7,8-tetrahydro-4H-thiazolo-[4,5-d]azepine)
BHT 933	= (2-amino-6-allyl-4,5,7,8-tetrahydro-6H-oxazolo-[5,4-d]azepine)
Bmax	= maximum binding capacity
β-R	= β-adrenergic receptor
Bro	= bromocriptine
BSA	= bovine serum albumin
C	= catalytic unit (or moiety) of adenylate cyclase
C	= adenylate cyclase activity
C	= connecting
Caln Kinase	= multifunctional calmodulin-dependent protein kinase
CAM	= calmodulin
cAMP	= cyclic adenosine monophosphate
Cap	= captopril
$Ca\text{-}P_l$	= calcium phospholipid-dependent protein kinase
CARD	= cardiolipin
CCV	= clathrin coated vesicles
CDP	= cytidine diphosphate
CGP-12177	= 4-(3-tertiary butylamino-2-hydroxypropoxy)-benzimidazol-2-one hydrochloride
CGRP	= calcitonin-gene-related peptide
CHOLEST.	= cholesterol
Clo	= clonidine
Clon	= clonidine
Con	= control

CON A	= concanavalin A
Con A	= concanavalin A
Cor	= corynanthine
CT	= cholera toxin
CV	= control vesicles
cyc^-	= coupling protein-deficient cells
CYP	= cyanopindolol
D_2-receptors	= dopamine$_2$ receptors
DA	= dopamine
d'-Adr	= d-adrenaline
DAG	= 1,2-diacylglycerol
DG	= diacylglycerol
DHA	= dihydroalprenolol
DMPC	= dimyristoyl phosphatidylcholine
DNP	= dinitrophenol
DOC	= deoxycholate
Dom	= domperidone
DOPEG	= dihydroxyphenylglycol
DTT	= dithiothreitol
DV	= desensitized vesicles
EDTA	= ethylenediamine tetraacetic acid
EGF	= epidermal growth factor
EGTA	= ethylene glycol-bis-(beta-amino-ethyl ether) N, N'-tetraacetic acid
ELISA	= enzyme linked immuno sorbent assay
endo F	= endoglycosidase F
Endo F	= endoglycosidase F
endo H	= β-N-acetylglucosaminidase H
Epi	= epinephrine
ER	= endoplasmatic reticulum
ETYA	= eiocosa tetraynoic acid
FMLP	= formyl-met-leu-phe (chemotactic peptide)
fMLP	= formyl Met-Leu-Phe (chemotactic peptide)
Forskolin-Sepharose	= 7-succinyl-, 7-deacetyl-forskolin coupled to aminoethyl-Sepharose
G	= coupling protein
G	= guanine nucleotide-binding regulatory protein
GABA	= gamma-aminobutryic acid
GDP	= guanosine-diphosphate
GDPβS	= guanosine 5'-(β-thio)diphosphate
G/F	= guanine nucleotide-binding regulatory protein
G_i	= inhibitory G protein, or inhibitory GTP-binding protein
GLcNAc	= N-acetylglucosamine
Glu	= glutamic acid
GMP	= guanosine monophosphate
GPL	= guinea pig lung
$Gpp(CH_2)p$	= γ5'-guanylmethylene diphosphate
$Gpp(NH)_p$	= γ5'-guanylylimidodiphosphate
Gpp(NH)p	= guanosine 5'-[β, γ-imido] triphosphate
G_s-α	= 42,000 Mr subunit of G_s
G_s-β	= 35,000 Mr subunit of G_s
G_s	= regulatory guanyl nucleotide-binding protein
G_s	= stimulatory, GTP-binding regulatory protein

G_s-RH	= regulatory guanyl nucleotide-binding protein – receptor hormone complex
GTP	= guanosine triphosphate
GTPγS	= 5′-guanosine-(γ-thio) triphosphate (a nonhydrolysable GTP analog)
H	= hormone
HBI	= hydroxybenzylisoproterenol
HEAT	= 2-(3-[4-hydroxyphenyl]-ethylaminomethyl)-tetralon
Hepes	= 4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid
HL	= hamster lung
HPLC	= high pressure liquid chromatography (molecular sieve HPLC)
(^{3}H)QNB-binding	= guinuclidinyl benzylate binding
HR	= complex form (receptor + hormone)
HRG_s	= ternary complex of hormone-receptor-guanyl nucleotide-binding protein
H_s	= stimulatory agonist
H state	= state of high affinity
Hyd	= hydralazine
IAP	= islet activating protein
IAP	= pertussis toxin
(^{125}I)APDQ	= 4-amino-6, 7-dimethoxy-2(4′-5′′[3′′′-(^{125}I)iodo-4′′′ azidophenyl]pentanoyl-1′-piperanzinyl)-quinazoline
IBMX	= 3-isobutyl-1-methyl-xanthine
ICI	= ICI 118551
ICYP	= iodocyanopindolol
Ifenprodil	= alpha-(4-hydroxyphenyl)-β-methyl-4(phenylmethyl)-1-piperidineethanol
(^{125}I)HYP	= (^{125}I)-hydroxybenzylpindolol
(^{125}I)IABP	= (^{125}I)-iodoazidobenzylpindolol
(^{125}I)IHYP	= (^{125}I)-iodohydroxybenzylpindolol
(^{125}I)-IPIN	= (^{125}I)-iodopindolol
132INI	= human astrocytome cells
Ins	= inositol
$InsP_3$	= inositol triphosphate
Ins-P_3	= inositol 1,4,5 triphosphate
IP_1	= inositol monophosphate
IP_2	= inositol biphosphate
IP_3	= inositol triphosphate
IP_3	= myoinositol 1,4,5-P_3
(^{125}I)pABC	= (±)15-(4-Azido, 3-[^{125}I]iodobenzyl)carazolol
(^{125}I)-PIN	= (^{125}I)-pindolol
Iso	= isoprenaline
ISO	= isoproterenol
ISOPR	= isoproterenol
K	= equilibrium constant
k_{ap}	= rates of receptor appearance
K_d	= affinity state
K_D	= affinity state
kDa	= kilodalton
KDa	= kilodalton
k_{dp}	= rates of receptor disappearance
kin	= kinase
Km	= Michaelis Konstante
$K_{m,app}$	= apparent Michaelis Konstante
l-Adr	= l-adrenaline

LDL	= low density lipoproteins
LHRH	= luteinizing hormone releasing hormone
l-Iso	= l-isoproterenol
l-NA	= l-noradrenalin
LPA	= *Limulus polyphemus* agglutinin
l-Phe	= l-phenylephrine
LS	= lauryl-sucrose
L state	= state of low affinity
Lys	= lysine
M7	= (2,N,N-dimethylamino-5, 6-dihydroxy-1, 2, 3, 4-tetrahydronaphthalene)
Meth	= methoxamine
Mito	= mitochondria
MOPS	= 3-(N-morpholino)-propane sulfonic acid
MW	= molecular weight
N	= coupling protein
N	= guanine nucleotide-binding regulatory protein
NA	= nicotinic acid
NAD	= nicotinamide-adenin-dinucleotide
NADH	= reduced form of NAD (oxidase or phospholipase)
NaF	= sodium fluoride
N_{beta}	= β-subunit of N protein
$N_{beta\ gamma}$	= βγ-subunit of N protein
NE	= norepinephrine
NEM	= N-ethyl maleimide
NGF	= nerve growth factor
NHNP-NBE	= N-[2-hydroxy-3-(1-naphtyloxy)-propyl]-N′-bromacetyl-ethylenidiamine (= β-adrenergic affinity ligand)
N_i	= inhibitory coupling protein
N_i	= inhibitory nucleotide regulatory protein
$N_{i\ alpha}$	= α-subunit of inhibitory coupling protein
Norepi	= norepinephrine
NRK	= normal rat kidney cells
N_s	= stimulating coupling protein
Ns	= stimulatory nucleotide regulatory protein
N_s	= guanine nucleotide-binding protein
N_s	= stimulatory guanine nucleotide-binding regulatory protein
$N_{s\ alpha}$	= α-subunit of stimulatory coupling protein
N.V.D.	= not validly determined
O_2^-	= superoxide anion
OcGlc	= octyl glucoside
OG	= n-octyl glucoside
OMeGlcNAc	= 1-O-methyl-N-acetyl-D-glucosamine
P	= parameter
p^{21ras}	= 21 kd protein encoded by *ras* oncogene
PA	= phosphatidic acid
PAF	= platelet activating factor
(^{32}P)- -ATP	= (^{32}P)- -adenosine triphosphate
PC	= soybean phosphatidylcholine
PC	= phosphatidylcholine
PDE	= phosphodiesterase
PE	= phosphatidyl ethanolamine
PG	= prostaglandin

PGDF = platelet derived growth factor
PGE_1 = prostaglandin E_1
PHP = pseudohypoparathyroidism
PTH = parathyroid hormone
Phe = phenylephrine
Phen = phentolamine
Phent = phentolamine
Phos Kinase = phosphorylase
PHP = pseudohypoparathyroidism
Pi = inorganic phosphate
PI = phosphatidylinositol
PIP = phosphatidylinositol 4-phosphate
PIP_2 = phosphatidylinositol 4,5-biphosphate
PKI = protein kinase inhibitor
PL = phospholipids
P-lipase = phospholipase
PM = plasma membranes
PMA = phorbol myristate acetate (tumor promoting phorbol extract)
PMSF = phenylmethylsulfonyl fluoride
PNA = peanut agglutinin
POB = phenoxybenzamine
pp60ras = 60 kd protein encoded by *ras* oncogene (oncogenic protein)
Pra = prazosin
Praz = prazosin
PRO = propandol
PS = phosphatidylserine
PT = pertussis toxin
Ptd acid = phosphatidic acid
PtdIns = phosphatidylinositol
PtdIns (4)P = phosphatidylinositol-4-monophosphate
PtdIns $(4,5)P_2$ = phosphatidylinositol 4,5-biphosphate
PTH = parathyroid hormone
quin-2 = 8-amino-2-[(2-amino-5-methylphenoxy)-methyl]-6-methoxychindin-N,N,N′,N′-tetraacetic acid (chelator and fluorimetric indicator for [calcium ion])
R = receptor(s)
R° = non-cooperative form of the receptor
R′ = cooperatively binding form of the R_i receptor
R″ = cooperatively binding form of the receptor (a different form from R′)
R_1 = 65,000 dalton (65 K) polypeptides
R_2 = 55,000 dalton (55 K) polypeptides
Rau = rauwolscine
RBC = red blood cell = erythrocyte
RCA = *Ricinus communis* agglutinin
Rho = rhodopsin
R_i = inhibitory receptor
R_i = inhibitory hormone receptor
RPM = rounds per minute
R-protein = receptor protein
R_s = stimulatory receptor
R_s = stimulatory hormone receptor
RS 21361 = (±)-2-(1-ethyl-2-imidazolyl)methyl-1, 4-benzodioxane
R_{ss} = steady state expression of receptors

S	= Suedberg sedimentation constant
SANAH	= N-succimidyl-6-4(4′-azido-2′-nitrophenylamino)hexanate
SCH	= SCH 23390
SDS-gel	= sodium dodecyl sulfate gel
SDS-Page	= sodium dodecyl sulfate polyacrylamide gel electrophoresis
SHR	= spontaneously hypertensive rats
SPV8	= *Staphylococcus* protease V8
T	= transducin
$t_{1/2}$	= receptor clearance
T_{alpha}	= alpha subunit of transducin
T_{beta}	= beta subunit of transducin
$T_{beta\ gamma}$	= beta + gamma subunits of transducin
T_{gamma}	= gamma subunit of transducin
TL99	= (2,N,N-dimethylamino-6, 7-dihydroxy-1,2,3, 4-tetrahydronaphthalene)
TME buffer	= 50 mM EDTA, Tris-HCl, 2 mM $Mg(Ac)_2$, pH 7.5
TNP buffer	= 10 mM Tris-HCl, 90 mM NaCl, 10 ug/ml soybean trypsin inhibitor, 200 μM benzamidine, 100 ug/ml bacitracin, 30 μM PMSF
TRH	= thyrotropin releasing hormone
TRIS	= 2-amino-2-hydroxymethylpropan-1,3-diol
TSH	= thyrotropin
TX	= thromboxane
UEA-F	= *Ulex europeus* agglutinin
UK 14304	= (5-bromo-6-[2-imidazolin-2-ylamino]-quinoxaline)
UNC	= uncoupled cells
V_1	= vasopressin
Vas	= vasodilator
VIP	= vasoactive intestinal polypeptide
VLP	= vasopressin-like neuropeptide
V_{max}	= the maximal initial velocity of a given enzyme concentration c(E)
WB 4101	= (N-[2-(2, 6-dimethoxyphenoxy)-ethyl], 1,4-benzodioxane-2-methylamine)
WGA	= wheat germ agglutinin
WT	= wild-type S49 lymphoma cell line
WT-cells	= wild-type S49 cells
WY 26703	= (N-methyl-N-1,3,4,6,7,11 b alpha-hexahydro-2H-benzo-[a]-quinolizin-2β-yl).-i-butanesulphonamide
Yoh	= yohimbine

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