Index

Pharmacological Reviews

Volume 43

1991

A	
Action patential autocallular NPM 5 HT reverse (52) 564	antagonists, 228
Action potential, extracellular, NRM 5-HT neuron (fig.), 564	antagonists, right atria (fig.), 229
Adenocarcinoma, mammary, nitric oxide synthase, 130	density, left ventricle (fig.), 225
Adenosine	effects of drugs, human heart, 228
agonists and antagonists, cerebellar cGMP (table), 11	failing human heart, 216
modulators, 6	heart failure (fig.), 217
receptors for inhibitory agonists, 275	human heart, 203
uptake and metabolism, 279	left ventricular membranes (fig.), 205
Adenosine 5'-diphosphate	maximal positive inotropic effect, right ventricular trabeculae
extracellular, metabolism, 255	(fig.), 227
receptors for stimulatory agonists, 250	6 months treatment, metoprolol (fig.), 230
Adenylate cyclase	myocardial, subtype distribution (table), 222
activation, ventricular G proteins, myopathy (table), 218	nonfailing human heart, 205
activation in end-stage ICM, ventricular G proteins (table), 221	positive inotropic drugs, 213
α_2 -adrenoceptor-mediated inhibition (fig.), 492	procaterol and noradrenaline (fig.), 229
coupling, beta adrenoceptors, 207	protein phosphorylation, 321
Adenylyl cyclase, inhibition, 486	subtype distribution, heart failure (table), 218
Adrenal gland, cyclic GMP levels, 124	subtype distribution, nonfailing human heart (table), 206
Adrenaline	transplanted human heart, 226
-induced positive inotropic effects, left papillary muscles (fig.), 211	Afferents, noradrenergic, 13
-induced stimulation of left ventricular adenylate cyclase, antago-	Ahlner, Johan, Rolf G. G. Andersson, Kristina Torfgård, and Krister
nism, beta adrenoceptors (fig.), 208	L. Axelsson. Organic nitrate esters: Clinical use and mechanisms
Adrenoceptors	of actions, 351
agonists and antagonists (table), 477	Airway diseases, nitrates, 391
alpha	Alcoholism, synapsin variants, 329
guanine nucleotide regulatory proteins, 490	Alprazolam, stress and, corticotropin-releasing factor concentrations
molecular biology, 500	(fig.), 455
occupancy and function, 488	Alzheimer's disease
proposed interaction (fig.), 493	alterations, regional brain corticotropin-releasing factor concentra-
signal transduction, 500	tions and receptors, 460
signal transduction mechanisms, 483	CRF-like immunoreactivity, receptor binding (fig.), 460
structure and function, 475	protein phosphorylation, 331
subclassification, 499	serotonin, 519
	· · · · · · · · · · · · · · · · · · ·
alpha-1	studies of m-chlorophenylpiperazine, 532
cloning of DNAs, 493	Amantadine, changes in motor activity, cerebellar cGMP (table), 3
competition by agonists and antagonists (table), 495	Amino acids
functional expression, cDNAs, 495	alignment of sequences, alpha-2 adrenoceptors (fig.), 496
heterogeneity, 477	branched-chain, 56
alpha-2	branched-chain and aromatic, "false" neurotransmitters, 37
alignment of amino acid sequences (fig.), 496	excitatory
cloning of DNAs, 496	GABAergic pathways and, 4
DNA expression, 498	nonselective antagonists, 14
heterogeneity, 480	release, 13
occupancy, signal transduction mechanisms, 489	γ-Aminobutyric acid
primary structure, kidney (fig.), 497	-benzodiazepine receptor complex, 42
signal transduction processes, mathematical model (fig.), 491	-BzR/chloride ionophore supramolecular complex (fig.), 42
sodium-hydrogen exchange (fig.), 488	excitatory amino acids and, 4
alpha-1 and alpha-2 classification, 476	mechanism of action of antipsychotics, 588
beta	receptor complex organization, 41
agonists, maximal positive inotropic effects (fig.), 220	γ -Aminobutyric acid-A, benzodiazepine receptor modulators, 5
agonists, spare receptors in heart, 224	γ-Aminobutyric acid-B, receptor agonists, 6
alterations, chronic heart failure, 223	Ammonia, major contributor, hepatic encephalopathy, 35
antagonism, stimulation of left ventricular adenylate cyclase (fig.),	Amperozide
208	pED_{50} (table), 594
antagonist radioligands (table), 205	pK_i values (table), 592

D-Amphetamine, changes in motor activity, cerebellar cGMP (table), 3	neuroendocrine measures, 544 patients with neuropsychiatric disorders, 542
β-Amyloid, precursor protein phosphorylation, neuritic plaques, 333	,
Analgesia, brain 5-HT, 567	Barbiturates, anesthetics and, cGMP in the cerebellum, 12
Andersson, Rolf G. G. See Ahlner et al., 351	Basile, Anthony S., E. Anthony Jones, and Phil Skolnick. The patho-
Anesthetics, barbiturates and, cGMP in the cerebellum, 12	genesis and treatment of hepatic eciphalopathy: Evidence for
Angina	the involvement of benzodiazepine receptor ligands, 27
stable, organic nitrates, 382	Behavior anxiety and depression, animal models, 449
unstable, silent myocardial ischemia, myocardial infarction, 387	corticotropin-releasing factor regulation, laboratory animals, 448
vasospastic	feeding, corticotropin-releasing factor, 449
glyceryl trinitrate, 386 isosorbide dinitrate and isosorbide-5-mononitrate, 386	locomoter activation, corticotropin-releasing factor, 448
Angiotensin-converting enzyme inhibitors, beta adrenoceptors, 231	oral-buccal movements, 573
Anorexia nervosa, endocrine and cerebrospinal fluid studies, 460	serotonin-mediated, antipsychotic drugs, 597
Antibiotics, hepatic encephalopathy, 55	serotonin-selective arylpiperazines, 527
Anticonvulsants, cerebellar cGMP (table), 10	sexual, corticotropin-releasing factor, 448
Antidiuretic hormone, disorders (table), 98	Benzodiazepine
Antiemesis, 5-HT ₃ receptor agents, 582	ligands (fig.), 43
Antipsychotics	nuclei biosynthesis (fig.), 52
atypical, 588	Bioassay, vasopressin antagonists, 75
pED ₅₀ (table), 594	Blood pressure
pK_i values, 5- HT_2 (table), 592	changes induced by oral administration, L-NAME and L-NMMA
serotonin receptor antagonism, 598	(fig.), 117
binding properties, serotonin receptors, 592	DRN 5-HT neuron (fig.), 574
clinical studies, 599	regulation, V ₁ antagonists, 78 Blood vessels, relaxant effect of glyceryl trinitrate (table), 355
cortical 5-HT ₂ and striatal pK _i values (table), 593	BMY 25801, BRL 24924 and, clinical status (table), 583
effects on serotonin receptors, 587	Brain
mechanism of action, neurotransmitters, 588	cerebral aqueduct or locus ceruleus, corticotropin-releasing factor
pK _d or pK _i values, 5-HT receptors (table), 592	infusion (fig.), 450
serotonin class 3 receptor antagonism, 598	developmental pharmacology, serotonin, other neurotransmitter, 553
serotonin-mediated behavior, 597	energy metabolism, m-chlorophenylpiperazine, 538
Anxiety animal models, 449, 544	first messengers regulating second messenger generation (table), 303
depression and, animal models, 537	hypothalamic corticotropin-releasing factor neurons, actions of cy-
Anxiety disorder	tokines, 444
serotonin function, 516	insulin-induced hypoglycemia, corticotropin-releasing factor mRNA
studies of azapirones, 542	(fig.), 441
Aorta	localization, corticotropin-releasing factor receptors, 433
effect of dexamethasone, constitutive and inducible nitric oxide	major corticotropin-releasing factor-stained cell groups, fiber systems (fig.), 429
synthase (fig.), 132	nigrostriatal and mesolimbic pathway, serotonergic innervation, 590
time-dependent loss of tone, effect of cycloheximide, L-NIO (fig.),	nigrostriatal pathways, serotonergic regulation, dopaminergic func-
130	tion, 595
Apomorphine, changes in motor activity, cerebellar cGMP (table), 3	pED ₅₀ , typical atypical antipsychotic drugs (table), 594
Arachidonic acid, metabolites, vascular actions, organic nitrate esters,	phosphoprotein phosphatases, 312
366	prevention of hyponatremia and cerebral edema, V ₂ antagonists, 88
L-Arginine	serine/threonine-specific protein phosphatases (table), 312
citrulline synthesis, Ca ²⁺ dependence, nitric oxide (fig.), 123	serotonergic neurons, behaving animal, 563
platelet aggregation, nitric oxide synthesis (fig.), 121	specific regions, topical administration, capsaicin, 164
structural formulae (fig.), 116 Arginine vasopressin	water content, serum osmolality, vasopressin antagonist (table), 90
elevated plasma levels, V ₁ antagonists, 96	Brodde, Otto-Erich. β_1 - and β_2 -adrenoceptors in the human heart:
ethanol-induced gastric lesions (fig.), 87	Properties, function, and alterations in chronic heart failure,
Arylpiperazines, serotonin-selective, effects in humans, 527	203
Aspirin, indomethacin and, drug interactions, nitrates, 406	Bulimia, migraine and, 532
Atenolol	Buspirone neuroendocrine responses, 514
human cardiac beta adrenoceptors (fig.), 213	single-dose studies in humans, 541
propranolol and, tachycardia (fig.), 212	single dose studies in numans, 041
Atropine, human cardiac beta adrenoceptors (fig.), 213	Calcium
Aulakh, C. S. See Murphy et al., 527	antagonists, 230
Axelsson, Krister L. See Ahlner et al., 351	dependence of nitric oxide and citrulline synthesis, L-arginine, brain
Azapirones	synaptosomal cytosol (fig.), 123
food intake, 544	-dependent protein kinases, 306, 308
healthy normal subjects, 541	homeostasis, organic nitrate esters, cyclic GMP, 363
5-HT _{1A} receptors, 541	-independent nitric oxide synthase (fig.), 129
in vitro and in animals, 543	influx, phosphorylation of GAP-43, 318
locomotor activity, 544	peak positive left ventricular dP/dT (fig.), 223
neurochemical effects, 543	-phospholipid-dependent protein kinases, 309

signal transduction, second messenger systems, 433	tems, 589
sodium chloride and, intracellular accumulation, neurotoxicity, 181	nitric oxide, 122
translocation, alpha adrenoceptor signal transduction, 483	Cerebellum
Calcium channels, voltage-dependent, 324	basic circuitry diagram (fig.), 4
Calcium current, capsaicin administration, 176	cell fractions, 4
Capsaicin	cyclic GMP and, motor activity, dopaminergics (table), 3
action	drug effects on cerebellar cGMP (table), 7
excitable cells (table), 188	pharmacology of cyclic guanosine 3',5'-monophosphate, 1
neurons, 189	slices, 4
primary afferent neurons, 145	Cerebrospinal fluid
acute and long-term effects, nonmammalian species, 168	corticotropin-releasing factor concentrations, 458
acute excitatory effects, mammalian sensory neurons, 146	schizophrenia (fig.), 459
administered to central endings, afferent neurons, 163	endocrine studies and, anorexia nervosa, 460
administered to peripheral endings, sensory neurons, 164	5-hydroxyindoleacetic acid, 511
biochemical characterization, recognition site, 174	Chloride channel, regulation, cystic fibrosis, 329
cell-nonspecific effects, 169	6-Chloro-2-(l-piperazinyl)pyrazine, studies in humans, 539
cellular targets, mechanisms of action, selectivity for thin sensory	m-Chlorophenylpiperazine
neurons, 143	food intake, 534
differences in sensitivity, mammalian species, 166	locomotor activity, 536
interaction with nerve growth factor, 184	neuroendocrine measures, 535
intermediate effects, mammalian sensory neurons, 150	other substituted phenylpiperazines and, 529
intracerebroventricular application, 163	patients with neuropsychiatric disorders, 530
-like substances, 186	related piperazines and, in vitro and in animals, 532
long-term neurotoxic effects, mammalian sensory neurons, 151	temperature, 534
mechanisms of action, 170	Chlorpromazine, pED_{50} (table), 594
mechanisms of cell-nonselective effects, 187	Cholecystokinin peptides, cerebellar cGMP (table), 9
ontogenetic shift in neurotoxicity, rat, 186	Choline
periaxonal administration, 160	modulators, 18
pharmacological tool, 189	serotonergic interactions, 520
pharmacological tool (table), 190	Cholinergics, cerebellar cGMP (table), 8
primary afferent neurons, markers (table), 146	Circadian rhythm
resiniferatoxin and, chemical structure (fig.), 145	corticotropin-releasing factor regulation, neuroendocrine function,
routes of administration, 190	435
ruthenium red as functional antagonist, 182	sleep-wake-arousal cycle, 564
selectivity of action, 155, 158, 160	Cirrhosis, amelioration of hepatic encephalopathy (fig.), 59
sensitivity, age and strain differences, mammalian species, 167	Citrulline, synthesis from L-arginine, Ca2+ dependence, nitric oxide
sensory neurons in culture, 165	(fig.), 123
sensory neurons in vitro, 165	Climbing fiber system, cGMP in the cerebellum, 15
systemic	Clozapine
adult mammals, 156, 160	atypical antipsychotic drugs, 588
newborn mammals, 151	pED_{50} (table), 594
targets and selectivity	pK, values (table), 592
excitable cells, mammals (table), 148	Coccaro, Emil F. See Siever et al., 509
excitatory action, 147	Collagen, blood platelet receptors, 271
topical administration, specific brain regions, 164	Convulsants, cerebellar cGMP (table), 10
Capsaicinoids	Coronary vessels, nitrate esters, 380
desensitizing and neurotoxic effects, structure-activity relationships,	Corticotropin-releasing factor
171	administration
excitatory effect, structure-activity relationship, 170	gastrointestinal responses, 447
Capsozepine, competitive antagonist of capsaicin, 173	metabolic responses, 447
Cardiovascular system corticotropin-releasing factor regulation, autonomic function, other	analgesic and anti-inflammatory properties, 445
	autonomic actions (fig.), 446
peripheral actions, 446 inhibition of nitric oxide synthesis, 114	binding in rat olfactory bulb membranes, 433
regulation, 5-HT neurons, 573	cerebrospinal fluid concentrations, 458 concentrations, alprazolam and stress (fig.), 455
serotonin-selective arylpiperazines, 527	concentrations, aiprazolam and stress (ng.), 455 concentrations and receptors, Alzheimer's disease, 460
Casein kinase, DARPP-32 cells, 311	-containing neurons and receptors, Alzheimer's disease, 400
Catalepsy, neuroleptic-induced, effect of serotonin, 595	electrophysiological responses, 451
Catecholamines	historical perspectives, 426
binding studies, 256	hypersecretion, pathophysiology, psychiatric illness, 457
false neurotransmitter hypothesis, 39	hypophysiotropic system, ontogeny of, 435
α-receptor, 255	infusion, animals in darkened compartment (fig.), 450
β-receptor, 284	-like immunoreactivity, receptor binding, Alzheimer's disease (fig.),
structure-activity relationships, 256	460
uptake and metabolism, 257	local gonadal actions, 448
Central nervous system	localization in peripheral tissues, 430
localization of corticotropin-releasing factor, 428	localization of messenger RNA, 432
neuroanatomical relationship, serotonergic and dopaminergic sys-	messenger RNA, insulin-induced hypoglycemia (fig.), 441

neurons	signs and symptoms (table), 451
actions of cytokines, 444	studies of azapirones, 542
effects of stress, 453	studies of m -chlorophenylpiperazine, 531
extrahypothalamic, miscellaneous changes, 456	N-Desmethyldiazepam
extrahypothalamic, pharmacological manipulation, 454	diazepam and (fig.), 51
feedback and stress-induced effects, 439	summary of levels (fig.), 53
nonhypophysiotropic, pharmacological and environmental pertur-	De Wied, David. See Lázló et al., 73
bation, 453	Dexamethasone
•	
other endocrine functions, 441	contitutive and inducible nitric oxide synthases, rat aorta (fig.), 132
responses, miscellaneous manipulations, 442	cycloheximide and, induction, nitric oxide synthase (fig.), 132
peptide and messenger RNA localization, 428	Diazepam
physiology and pharmacology, 425	N-desmethyldiazepam and (fig.), 51
pituitary corticotrophs, 436	summary of levels (fig.), 53
potentiation of action on corticotroph, 437	Diet, hepatic encephalopathy, 55
pressure application, different neurons (fig.), 451	Dihydroergotamine, sumatriptan interactions, neurotransmitter recep
receptors, 433	tor (table), 581
anterior pituitary, feedback- and stress-induced effects, 441	DNA
regulation	α ₂ -adrenoceptor, 498
autonomic function, other peripheral actions, 446	cloning of α_1 -adrenoceptor, 493
behavior, laboratory animals, 448	DNA, complementary
· · · · · · · · · · · · · · · · · · ·	
immune function, 444	α_1 -adrenoceptor, functional expression, 495
neuroendocrine function, 435	alpha-2 adrenoceptor cloning, 496
neuron, neurotransmitter regulation, 437	Dobutamine
reproductive hormone function, 442	beta adrenoceptors, 214
-stained cell groups and fiber systems, rat brain (fig.), 429	left ventricular dP/dT, dilated cardiomyopathy (fig.), 230
stimulation test, 457	peak positive left ventricular dP/dT (fig.), 223
Corticotropin-releasing hormone, gene, structural organization, rat	Dopamine
(fig.), 433	beta adrenoceptors, 214
Cusack, Noel J. See Hourani and Cusack, 243	mechanism of action of antipsychotics, 588
Cyclic AMP, contractile force, time course of effects, isoprenaline (fig.),	-mediated behavior, mesolimbic pathway, effect of serotonin, 597
209	mesolimbic pathways, effect of serotonin, 597
	The state of the s
Cyclic GMP	modulators, 16
action of organic nitrate esters, 357	regulation of natriuresis, 330
cerebellar	serotonergic regulation, 595
antagonism by drugs (table), 15	serotonin and, 520
drug and behavioral effects, stress, 3	neuroanatomical relationship, 589
drug effects (table), 7	Dopaminergics, changes in motor activity, cerebellar cGMP (table), 3
modulation, NO synthetase inhibitor (table), 14	Dopexamine, beta adrenoceptors, 214
changes in motor activity, dopaminergics (table), 3	Drug discrimination
confounding variables, 2	animal models, anxiety and depression, 544
-dependent protein kinase, 306	anxiety and depression, animal models, 537
diagram of basic components (fig.), 357	anxious and depression, animal models, oor
•	EAA, -dependent increases, antagonists, mouse cerebellar cGMP level
lesions and mutant mice, 2	(table), 15
logit-log dose-response curves, CPP and tiletamine (table), 14	EAA agonists, antagonists and, cerebellar cGMP (table), 11
microwave tissue fixation, 2	Edema, cerebral, prevention of hyponatremia, V ₂ antagonists, 88
mouse cerebellar, antagonists, EAA-dependent increases (table), 15	Electroencephalography, convulsive studies and, 452
organic nitrate esters, cellular calcium homeostasis, 363	
pharmacology of, cerebellum, 1	Electrophysiology
relation to mode of action, organic nitrate esters, 359	m-chlorophenylpiperazine, 533
routes of drug administration, 2	mesolimbic dopamine pathways, effect of serotonin, 597
schematic drawing showing cellular mechanisms, mediation, vascular	responses to corticotropin-releasing factor, 451
smooth muscle relaxation (fig.), 365	serotonergic regulation, dopaminergic function, 595
tissue microdissection, 2	Emesis, 5-HT ₃ receptor agents, 582
Cycloheximide	Encephalopathy
	hepatic
dexamethasone and, induction, nitric oxide synthase (fig.), 132	amelioration (fig.), 59
L-NIO and, time-dependent loss of tone, aorta (fig.), 130	animal models, 34
Cystic fibrosis, chloride channel regulation, 329	behavioral characteristics of rabbit (table), 34
Cytokines, actions on hypothalamic corticotropin-releasing factor neu-	benzodiazepine ligands, rat brains (fig.), 50
rons, 444	
	benzodiazepine ligands (fig.), 49
	benzodiazepine receptor ligands (fig.), 46
Denopamine, beta adrenoceptors, 214	benzodiazepine receptor ligands, 48
Depressants, cerebellar cGMP (table), 10	chronic, 54
Depression	clinical manifestations, 29
animal models, 449, 544	clinical stages (table), 30
anxiety and, animal models, 537	complications of liver disease, 54
major	definition, 28
corticotropin-releasing factor hypersecretion, 457	development of, traditional concepts (fig.), 33
COLDICOLOGIA: ICICAGNIE IACON NIVOCIACCICUIU. 407	actoroment on manifolial concerts (112.1. (b)

electrophysiology, 31	concentration-effect curve (fig.), 355
GABA/benzodiazepine receptor complex, 42	congestive heart failure, 389
improvement of hepatocellular function, 54	distribution, 374
insufficiency and vascular rearrangement (fig.), 29	handling of samples, 372
metabolites found in abnormal levels (table), 34	influence of posture, 373
neuropathology, 30	influence of sampling site, 372
pathogenesis and treatment, 27	intravenous, tolerance development, 392
precipitating factors, 53	invention of, 353
proposed mechanisms of pathogenesis, 32	isoprenaline and, induced hypotension, effect of L-NIO (fig.), 119
reduction, portal-systemic shunting, 54	lactate production, ventricular heart muscle (fig.), 363
therapeutic modalities, 53, 54	metabolism and elimination, 375
Endothelial cells, Ca ²⁺ -independent nitric oxide synthase, time course	ointment and patches, 393
of induction (fig.), 129	oxygen consumption, ventricular heart muscle (fig.), 366
Endothelium, interaction with organic nitrate esters, 370	pharmacokinetic data, 374
Endothelium-derived relaxing factor	pharmacokinetics, effect of exercise, 373
controversy about chemical identity, 112	pharmacokinetic studies, 370
identification as nitric oxide, 111	relaxant effect on blood vessels (table), 355
nitric oxide and, comparison of stability (fig.), 112	route of administration, 373
Enzyme, activation, capsaicin, 177	sorption to materials, 370
Epinine, beta adrenoceptors, 214	stable angina pectoris, 382
Ethanol	tolerance development, 392
cGMP in the cerebellum, 12	Glycine, NMDA-associated agonists, 13
corticotropin-releasing factor, actions on HPA axis, 443	Glycogen synthase kinase 3, regulation of cell-cell interactions, 311
-induced gastric lesions, plasma AVP (fig.), 87	Gonads, local actions, corticotropin-releasing factor, 448
Ethylene glycol dinitrate, concentration-effect curve (fig.), 355	G-proteins
Exercise, pharmacokinetics of glyceryl trinitrate, 373	α -adrenoceptor function, 490
Fatty acids, central nervous system electrical activity, 39	-coupled receptor proteins, schematic model (fig.), 494
Fenfluramine	-coupled receptors, 321
neuroendocrine responses, 512	ventricular
responses, extrahypothalamic corticotropin-releasing factor neurons,	adenylate cyclase activation, myopathy (table), 218
454	adenylate cyclase activation, end-stage ICM (table), 221
Fibroblasts, generation of nitric oxide, 130	Granisetron
Flumazenil	antiemesis, 582
antagonist to benzodiazepine, 57	clinical status (table), 583
efficacy in clinical trials (table), 59	Greengard, Paul. See Walaas and Greengard, 299
pharmacological properties, 58	Growth hormone, secretion, corticotropin-releasing factor neurons, 441
potential clinical use, 58	Guanylate cyclase characteristics of Nervous and Weaver mice (table), 3
remission of chronic intractable PSE (fig.), 60	proposed scheme for NMDA augmentation (fig.), 21
Fluperlapine	soluble, trasduction mechanism, nitric oxide, 110
pED_{50} (table), 594	Guinea pig, long-term neurotoxic effects, capsaicin, mammalian sen-
pK_i values (table), 592	sory neurons, 159
Fluphenazine, pED ₅₀ (table), 594	soly heurons, 103
Fornal, Casimir A. See Jacobs and Fornal, 562	Haloperidol, pED ₅₀ (table), 594
Forskolin, heart rate response to increasing doses, bolus injections	Heart
(fig.), 224	aortic valve disease, 223
	atrial tissues, positive inotropic effects, 209
GABAergic agents, cerebellar cGMP (table), 9	autonomic actions, corticotropin-releasing factor (fig.), 446
GAP-43, phosphorylation by Ca ²⁺ influx, 318	biventricular failure, ventricular beta adrenoceptors, subtype distri-
Gastric circulation	bution (table), 218
mucosa, V ₁ antagonist (fig.), 86	chronic failure, alterations, beta adrenoceptors, 223
role of vasopressin, cytoprotection (fig.), 86	circulation, vasopressin antagonists, 81
vasopressin antagonists, 84	congestive failure, nitrates, 389
Gastrointestinal system, corticotropin-releasing factor administration,	dilated cardiomyopathy, dobutamine, left ventricular dP/dT (fig.),
447	230
Gene, corticotropin-releasing hormone, structural organization, rat	end-stage dilated cardiomyopathy, ventricular G proteins (table), 218
(fig.), 433	end-stage ischemic cardiomyopathy, 220
Genetic disorders, role of corticotropin-releasing hormone, animal	ventricular G proteins (table), 221
models, 443	failing, beta adrenoceptors, 216
Glucocorticoids, immunologically induced formation, nitric oxide, 131	failure, beta adrenoceptors (fig.), 217
Glucose DRN 5 UT nouses and continuit REC (6xx) 570	human
DRN 5-HT neuron and cortical EEG (fig.), 572	beta adrenoceptors, 203
implication of brain 5-HT, 571 Glyceryl trinitrate	effects of drugs, beta adrenoceptors, 228
absorption and bioavailability, 374	hypertrophic obstructive cardiomyopathy, 223
analysis of, 371	idiopathic dilated cardiomyopathy, 217 left ventricle, density, beta adrenoceptors (fig.), 225
analytic methods for GC determination (table), 372	left ventricie, density, <i>beta</i> adrenoceptors (ng.), 225
buccal and oral, tolerance development, 393	antagonism of stimulation, beta adrenoceptors (fig.), 208

determination, beta adrenoceptors (fig.), 205	Interferon-γ, Ca ²⁺ -independent nitric oxide synthase, time course of
mitral valve disease, 221	induction (fig.), 129
myocardial beta adrenoceptors, subtype distribution (table), 222	Ion channels
nonfailing	regulation, 322
beta adrenoceptors, 205	regulation following intracellular injection, protein kinases, nerve
numbers of beta adrenoceptors, subtype distribution (table), 206	cells (table), 323
nonfailing or end-stage DCM, maximal positive inotropic effects,	Ionophores, GABA/BzR/chloride, supramolecular complex (fig.), 42 Ipsapirone, single-dose studies in humans, 541
beta adrenoceptors (fig.), 220 peak positive left ventricular dP/dT, dobutamine or calcium gluco-	Isoprenaline
nate infusion (fig.), 223	contractile force and cAMP (fig.), 209
right atria	GTN and, induced hypotension, effect of L-NIO (fig.), 119
beta adrenoceptor antagonists (fig.), 229	heart rate response to increasing doses, bolus injections (fig.), 224
isoprenaline-induced positive inotropic effect (fig.), 210	-induced increases in heart rate (fig.), 212
procaterol and noradrenaline (fig.), 229	-induced positive inotropic effect, right atria (fig.), 210
spare receptors, beta adrenoceptor agonists, 224	-induced stimulation of left ventricular adenylate cyclase, antago-
tetralogy of Fallot, 223	nism, beta adrenoceptors (fig.), 208
transplanted human, beta adrenoceptors, 226	percentage of receptor occupancy, positive inotropic effect (fig.), 226
V ₁ antagonist, perfusion pressure changes (fig.), 82	Isosorbide dinitrate
vasoconstriction, vasopressin analogues (fig.), 82	absorption and bioavailability, 376
ventricular muscle, lactate production, glyceryl trinitrate (fig.), 363	distribution, 377
ventricular tissues, 210	isosorbide-5-mononitrate and
Heart rate	congestive heart failure, 389
DRN 5-HT neuron (fig.), 574	pharmacokinetic data, 376
firing rate of DRN 5-HT neurons (fig.), 570	stable angina pectoris, 384
isoprenaline-induced increases (fig.), 212	metabolism and elimination, 377
response to bolus injections, isoprenaline and forskolin (fig.), 224	tolerance development, 394
Hemodynamics, peripheral, nitrate esters, 378	isosorbide-5-mononitrate, tolerance development, 394
Heparin, drug interactions, nitrates, 406	Jacoba Darmy I and Casimir A Formal Assistant Sharing acceptances
Hepatocytes, Kupffer cells and, nitric oxide, 129	Jacobs, Barry L. and Casimir A. Fornal. Activity of brain serotonergic
Hieble, J. Paul. See Ruffolo et al., 475	neurons in the behaving animal, 562 Jones, E. Anthony. See Basile et al., 27
Higgs, E. A. See Moncada et al., 109	Jones, E. Anthony. See Dashe et al., 27
Histamine	Kahn, René S. See Siever et al., 509
mechanism of action of antipsychotics, 588	Kainate, low-dose response curves, mouse cerebellar cGMP (fig.), 13
nitric oxide, 124	Kidney
Holzer, Peter. Capsaicin: Cellular targets, mechanisms of action, and	alpha-2 adrenoceptor, primary structure (fig.), 497
selectivity for thin sensory neurons, 143	autonomic actions, corticotropin-releasing factor (fig.), 446
Hourani, Susanna M. O. and Noel J. Cusack. Pharmacological receptors	hemodynamic changes, V ₁ antagonist (fig.), 84
on blood platelets, 243 HP-370, pED ₅₀ (table), 594	Kupffer cells, hepatocytes and, nitric oxide, 129
5-Hydroxyindoleacetic acid	I askulana mlakad ambabadasan and banatis amanbalanatha 60
cerebrospinal fluid, 511	Lactuloase, related carbohydrates and, hepatic encephalopathy, 56
patients with affective and personality disorders, 515	László, Ferenc, Jr. See Lázló et al., 73 László, Ferenc A., Ferenc Lásló, Jr., and David De Wied. Pharmacology
receptor subtypes, 515	
5-Hydroxytryptamine	and clinical perspectives of vasopressin antagonists, 73 Lawlor, Brian A. See Siever et al., 509
binding studies and receptor isolation, 259	Lawrence, Timothy L. See Siever et al., 509
structure-activity relationships, 258	Lergotrile, changes in motor activity, cerebellar cGMP (table), 3
uptake and metabolism, 259	Lesch, K. P. See Murphy et al., 527
Hypertension, DRN 5-HT neuron (fig.), 575	Ligands
Hypoglycemia, insulin-induced, corticotropin-releasing factor mRNA	benzodiazepine
(fig.), 441	hepatic encephalopathy, rabbits (fig.), 49
Hyponatremia, cerebral edema and, prevention of, V ₂ antagonists, 88	hepatic encephalopathy, rat brains (fig.), 50
Hypotension, induced by isoprenaline and GTN, effect of L-NIO (fig.),	summary of levels (fig.), 53
119	benzodiazepine receptor
	hepatic encephalopathy, 27
	open field performance, hepatic encephalopathy (fig.), 46
ICI 204,636, cortical 5-HT ₂ and striatal pK _i values (table), 593	sigma, 14
ICS 205-930, antiemesis, 582	Lipopolysaccharide, Ca2+-independent nitric oxide synthase, time
N-Iminoethyl-L-ornithine	course of induction (fig.), 129
cycloheximide and, time-dependent loss of tone, aorta (fig.), 130	Liver, nitric oxide synthase activity, lipopolysaccharide (fig.), 131
hypotension induced by isoprenaline and GTN (fig.), 119	Locomotion
platelet anti-aggregatory activity (fig.), 126	azapirones, 544
Impression, social section and	m-chlorophenylpiperazine, 535
Immune function, regulation, corticotropin-releasing factor, 444	Long-term potentiation, regulation of, 327
Indole, modulators, 19 Insulin	Loxapine, pED ₅₀ (table), 594
DRN 5-HT neuron and cortical EEG (fig.), 572	Macrophages
-induced hypoglycemia, corticotropin-releasing factor mRNA (fig.),	effect of L-NMMA (fig.), 128
441	synthesis of nitric oxide, 124
	- ·

Mammals	Nash, J. Frank. See Meltzer and Nash, 586
adult, systemic capsaicin, 156	Natriuresis, dopaminergic regulation, 330
differences in sensitivity	Nemeroff, Charles B. See Owens and Nemeroff, 425
age and strain differences, 167	Nerve
capsaicin, 166	alveolar, stimulation, NRM 5-HT neurons (fig.), 569
newborn, systemic capsaicin, 151, 155, 157	conduction, blockade of, 151
MAP-2, phosphorylation, 332 MARCKS protein, phosphorylation, 317	neurogenic inflammation, 581 Nerve cells
Mass spectrometry, ¹⁸ NO release from porcine aortic endothelial cells	functional importance, second messenger-regulated protein kinases
(fig.), 114	305
MDL 72222, clinical status (table), 583	regulation of ion channels, intracellular injection, protein kinase
Melperone	(table), 323
pED ₈₀ (table), 594	Nerve growth factor, interaction with capsaicin, 184
pK _i values (table), 592	Nerve terminal
Meltzer, Herbert Y. and J. Frank Nash. Effects of antipsychotic drugs	phosphoproteins, presynaptic receptors, 319
on serotonin receptors, 586	protein phosphorylation, depolarization-induced Ca ²⁺ influx (table)
Mental illness, neuropeptide therapy, 461	316
1-(2-Methoxyphenyl)piperazine, studies in humans, 540	Nervous system, function, protein kinases (table), 304
N-Methyl-D-aspartate	Neuritic plaques, β-amyloid precursor protein phosphorylation, 333
-associated glycine agonists, 13 -associated glycine receptor antagonists, 14	Neurochemistry, m-chlorophenylpiperazine, 533 Neuroendocrine function, corticotropin-releasing factor regulation, 438
augmentation, proposed scheme (fig.), 21	Neuroendocrinology, m-chlorophenylpiperazine, 535
low-dose response curves, mouse cerebellar cGMP (fig.), 13	Neurofibrillary tangles, tau factor phosphorylation, 332
Methylphenidate, changes in motor activity, cerebellar cGMP (table),	Neurofilament proteins, phosphorylation, 331
3	Neurons
Metoprolol, 6 months treatment, beta adrenoceptor density, heart (fig.),	afferent, central endings, capsaicin administration, 163
230	capsaicin-sensitive, 169
Mice	corticotropin-releasing factor
characteristics of Nervous and Weaver strains (table), 3	actions of cytokines, 444
mutant, cyclic GMP, 1	distribution, 428
Microtubule proteins, phosphorylation, 331	effect of pressure application (fig.), 451
Migraine	effects of stress, 453
bulimia and, 532	extrahypothalamic, pharmacological manipulation, 454
sumatriptan, 579 Moncada, S., R. M. J. Palmer, and E. A. Higgs Nitric oxide: Physiology,	feedback and stress-induced effects, 439 nonhypophysiotropic, pharmacological and environmental pertur
pathophysiology, and pharmacology, 109	bation, 453
Monoaminergic agents, cerebellar cGMP (table), 7	other endocrine functions, 441
N-Monomethyl-L-arginine, modulation of cerebellar cGMP, NO syn-	regulation, 437
thetase inhibitor (table), 14	responses, miscellaneous manipulations, 442
N ^G -Monomethyl-L-arginine	DRN 5-HT
changes in blood pressure (fig.), 117	cortical EEG (fig.), 572
effect on aortic pressure (fig.), 116	firing rate, heart rate (fig.), 570
leishmanicidal activity, activated macrophages (fig.), 128	heart rate and blood pressure (fig.), 574
platelet anti-aggregatory activity (fig.), 126	5-HT _{1A} agonist (fig.), 576
Morphine	hypertension, hypotension (fig.), 575
response of single NRM 5-HT neuron (fig.), 569	peak elevation of brain temperature (fig.), 572
tail-flick test, NRM 5-HT neurons (fig.), 567	physiological responses (fig.), 570
Mossy fiber system anatomy/neurochemistry, 16	quiet waking, feeding and active waking (fig.), 576 respiratory rate, heating trial (fig.), 571
pharmacology, 16	sleep-wake cycle (fig.), 565
polysynaptic circuitry (fig.), 17	stress, 568
Murphy, D. L., K. P. Lesch, C. S. Aulakh, and T. A. Pigott. Serotonin-	suppression, orientation to opening the door (fig.), 576
selective arylpiperazines with neuroendocrine, behavioral, tem-	waking, sleep (fig.), 577
perature, and cardiovascular effects in humans, 527	function, protein phosphorylation, 299
Muscimol, Purkinje neuron responses (fig.), 44	5-HT
Muscle, smooth	cardiovascular regulation, 573
sumatriptan effects, 580	mean discharge rates (fig.), 566
vascular	lack of sensitivity, neurotoxic action, capsaicin, 169
cellular mechanisms, cyclic GMP (fig.), 365	mammalian sensory, acute excitatory effects, capsaicin, 146
cyclic GMP system, organic nitrate esters, 359 hyperpolarization, 366	NCS 5-HT, transition from REM sleep to wakefulness (fig.), 566 NRM 5-HT
relaxant action, organic nitrate esters (fig.), 370	alveolar nerve stimulation (fig.), 569
Myelin basic protein kinase, phosphorylation, 311	extracellular action potential (fig.), 564
Myocardial infarction	mean discharge rate (fig.), 568
glyceryl trinitrate, 388	tail-flick trials (fig.), 567
unstable angina, 387	primary afferent
Myocardial ischemia, unstable angina, 387	capsaicin, acute and long-term effects (table), 148
Myocardium, cyclic GMP system, organic nitrate esters, 359	capsaicin actions, 145

markers, capsaicin sensitivity (table), 146	clinical therapeutic use, 382
secondary changes in pathways, 154	cross-tolerance, 397
sensory	differences between different target organs, 397
capsaicin, long-term neurotoxic effects, 151	tolerance development and dependency, 392
consequences of excitation, 149	peripheral vascular diseases, 391
culture, capsaicin, 165	relationship between pharmacokinetics, therapaeutic effects, 377
intermediate effects, capsaicin, 150	side effects, 407
in vitro, effects of capsaicin, 165	Nitric oxide
mechanisms of action, 188	Ca ²⁺ dependence, citrulline synthesis from L-arginine (fig.), 123
mechanisms of selective effects, 174	effector molecule, immunological reactions, 124
peripheral endings, capsaicin administration, 164	endothelium-derived relaxing factor, 111
peripheral endings, capsaicin action, 184	immunologically induced formation in vivo, 130
serotonergic, behaving animal, 563	inhibition by glucocorticoids, 131
thin sensory, capsaicin, 143	inhibition of synthesis, cardiovascular system, 114
Neuropeptides, therapy of human mental illness, 461	measured by bioassay and by chemiluminescence, 111
Neuropeptide Y, corticotropin-releasing factor, actions on HPA axis,	novel inhibitors, 116
443	pathological implications, 118
Neuropsychiatric disorders	pharmacological actions, 120
overview, 510	pharmacological and physiological implications, 117
serotonin and, 507	physiology, pathophysiology, pharmacology, 109
serotonin receptor subtypes, 579	physiology and pathophysiology of synthesis, 126
studies of azapirones, 542	release from porcine aortic endothelial cells, mass spectrometry (fig.),
studies with m-chlorophenylpiperazine, 530	114
Neurotoxins, synergism, 38, 39	synthesis, 114, 120
Neurotransmitter	L-arginine, platelet aggregation (fig.), 121
developing systems, interactions, 557	macrophages, 124
excitatory amino acid, 40	transduction mechanism, soluble guanylate cyclase, 110
"false", branched-chain and aromatic amino acids, 37	Nitric oxide synthase
interaction, serotonin, 516	activity in rat liver, lipopolysaccharide (fig.), 131
liver failure, 39	Ca ²⁺ -independent (fig.), 129
mechanism of action, antipsychotics, 588	characteristics, 125
pathways, regulation of interactions, 325	constitutive and inducible, effect of dexamethasone, rat aorta (fig.),
regulation of corticotropin-releasing factor, 437	132
regulation of synthesis, tyrosine hydroxylase, 314	induction, effect of cycloheximide, dexamethasone (fig.), 132
release, synapsins, 314	similarities and differences, constitutive and inducible groups (table),
synthesis and release, phosphoproteins, presynaptic function, 314	126
Neutrophils, nitric oxide, 128	N ^G -Nitro-L-arginine methyl ester, changes in blood pressure (fig.), 117
Nichols, Andrew J. See Ruffolo et al., 475	Nitroprusside, chemical structure of organic nitrate esters (fig.), 353
Nitrate esters	Nociception
coronary vessels, 380	m-chlorophenylpiperazine, 538
in vitro evaluation of effects, 354	tail-flick test, NRM 5-HT neurons (fig.), 567
in vivo evaluation of effects, different target organs, 378	Noradrenaline (7)
mode of action, cyclic GMP, 359	-induced positive inotropic effects, left papillary muscles (fig.), 211
organic	-induced stimulation of left ventricular adenylate cyclase, antago-
arachidonic acid metabolites, 366	nism, beta adrenoceptors (fig.), 208
chemical structure (fig.), 353	Noradrenergic modulators, cGMP in the cerebellum, 20
clinical use, mechanisms of actions, 351	Noradrenergic system, function of, 514
cyclic GMP, cellular calcium homeostasis, 363	Norepinephrine, mechanism of action of antipsychotics, 588
explanation of tolerance (fig.), 401	
interaction with endothelium, 370	Obsessive-compulsive disorder, studies of <i>m</i> -chlorophenylpiperazine,
mechanism of, 398	530
other suggested mechanisms, 365	Olfactory bulb, rat membranes, corticotropin-releasing factor binding,
pharmacokinetics, 370	433
proposed mechanism of action, cellular level, 357	Ondansetron, antiemesis, 582
relaxant action, vascular smooth muscle (fig.), 370	Opiates CNTP (111)
· · · · · · · · · · · · · · · · · · ·	cerebellar cGMP (table), 8
tissue biotransformation, 367 relaxant effect, regional and species differences, 355	cGMP in the cerebellum, 19
, ,	ORG 5222, cortical 5-HT ₂ and striatal pK _i values (table), 593
vasodilatory effects, 356	Owens, Michael J. and Charles B. Nemeroff. Physiology and pharma-
Nitrates	cology of corticotropin-releasing factor, 425
airway diseases, 391	Oxygen consumption, effect of glyceryl trinitrate, ventricular heart
dependency, 404	muscle (fig.), 366
clinical problem, 404	
mechanism of, 404	Palmer, R. M. J See Moncada et al., 109
drug interactions, 406	Panic disorder, studies of m-chlorophenylpiperazine, 530
miscellaneous therapeutic uses, 391	Pentaerythreitol tetranitrate, chemical structure of organic nitrate
noncardiovascular uses, 391	esters (fig.), 353
organic	Peptide, release, capsaicin, 177

TO 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.	6 4' 11' 11' 11
Peripheral tissues, localization of corticotropin-releasing factor, 430	functional importance, 300
Perlapine, pK _i values (table), 592	neuronal, multiple sites (table), 302
Peroutka, Stephen J. Serotonin receptor subtypes and neuropsychiatric	neuronal function, 299
diseases: Focus on $5-HT_{1D}$ and $5-HT_3$ receptor agents, 578	systems, 301
Pharmacology, developmental, 553, 558	Protein kinases
Phenols, liver enzymes, 39	activation by second messengers, 303
Phenylpiperazines	brain, 302
m-chlorophenylpiperazine, 529	Ca ²⁺ /calmodulin-dependent, 306, 308
substituted, studies in humans, 539	Ca ²⁺ /phospholipid-dependent, 309
Phosphatidylinositol, turnover, cyclic nature (fig.), 484	cyclic GMP-dependent, 306
Phosphodiesterase inhibitors, beta adrenoceptors, 231	cyclic rucleotide-dependent, 303
	•
Phospholipid, metabolism, 484	general mechanisms for activation, 302
Phosphoprotein phosphatases, brain, 312	nervous system function (table), 304
Phosphoproteins	neurofilament, 311
clinical disorders and, 328	regulation of ion channels (table), 323
nerve terminal, presynaptic receptors, 319	second messenger-independent, 311
postsynaptic function, 319	second messenger-regulated, 303
presynaptic function, 314	tyrosine-specific, 311
Phosphorylase kinase, brain, 309	Protein phosphatases
Pigott, T. A. See Murphy et al., 527	serine/threonine-specific (table), 312
Pipamperone, pK _i values (table), 592	tyrosine-specific, 313
Piperazines, m-chlorophenylpiperazine, in vitro and in animals, 532	• •
Piribedil, changes in motor activity, cerebellar cGMP (table), 3	Protein phosphorylation
· · · · · · · · · · · · · · · · · · ·	Alzheimer's disease, 331
Pitressin, serum sodium level, V ₂ antagonists (fig.), 89	depolarization-induced Ca ²⁺ influx, nerve terminals (table), 316
Pituitary	regulation of plasma membrane receptors (table), 320
anterior, corticotropin-releasing factor receptor, feedback- and	Protooncogenes, tyrosine-specific protein kinases, 311
stress-induced effects, 441	Psychiatric disorders, role of serotonin, 509
localization, corticotropin-releasing factor receptors, 433	Psychiatric illness, pathophysiology, corticotropin-releasing factor hy-
Plasma membrane, receptors, regulation, protein phosphorylation (ta-	persecretion, 457
ble), 320	Psychiatry, serotonin function, 516
Platelet-activating factor	Purkinje neurons
binding studies and receptor isolation, 269	differential sensitivity (fig.), 45
blood platelet receptors, 267	
structure-activity relationships, 268	responses, rate meter records, muscimol (fig.), 44
uptake and metabolism, 270	responses to Ro 14-7437 (fig.), 45
Platelets	Pyrogen, activity of DRN-5HT neuron (fig.), 571
	Pyruvate dehydrogenase kinase, activation in brain, 311
aggregation, L-arginine, nitric oxide synthesis (fig.), 121	Online in the district of the Property of the
anti-aggregatory activity, effect of L-NIO, L-NMMA (fig.), 126	Quipazine, studies in humans, 540
cyclic GMP system, organic nitrate esters, 359	Quisqualate, low-dose response curves, mouse cerebellar cGMP (fig.),
-imipramine binding, 512	13
in vivo evaluation of effects, nitrate esters, 381	Raclopride, pED ₅₀ (table), 594
pharmacological actions of nitric oxide, 120	
pharmacological receptors, 243	Radioligands, beta-adrenoceptor antagonist (table), 205
responses, 245	Rat
serotonin uptake, 512	long-term neurotoxic effects, capsaicin, mammalian sensory neurons,
stimulus-response coupling, 247	151, 160
structure and function, 244	ontogenic shift in neurotoxicity, capsaicin, 186
Polyamines, antagonism, effects of NMDA, quisqualate receptor acti-	Receptors
vation, 14	adenosine, agonists and antagonists (fig.), 276
Posture, influence on glyceryl trinitrate, 373	adenosine A2, characteristics, Nervous and Weaver mice (table), 3
Potassium channel	adenosine 5'-diphosphate
	agonists (fig.), 251
activation, 366	antagonists (fig.), 252
nerve cells, 323	affinity profile
Practolol, propranolol or, salbutamol-induced tachycardia (fig.), 213	• •
Prenalterol, beta adrenoceptors, 214	azapirones, 543
Prolactin, secretion, atypical antipsychotic drugs, 588	second messenger system effects, 532
Pro-opiomelanocortin, corticotropin-releasing factor regulation, neu-	alpha, catecholamines, 255
roendocrine function, 435	benzodiazepine
Propranolol	antagonists, 57
atenolol and, tachycardyia (fig.), 212	GABA, hepatic encephalopathy, 42
practolol or, salbutamol-induced tachycardia (fig.), 213	ligands, hepatic encephalopathy, 27, 48
Prostaglandins	ligands (fig.), 46
Na ⁺ /H ⁺ exchange, alpha adrenoceptors, platelets (fig.), 488	modulators, 5
structure-activity relationships, 280	beta, catecholamines, 284
thromboxane and, 262	blood platelets, 243
Protein	cholecystokinin, modulators, 18
phosphorylation	corticotropin-releasing factor, 433
brain, first messengers (table), 301	anterior pituitary, feedback- and stress-induced effects, 441
DIGIL HISLINGSCHEELS (LEDIC), OVI	anteno pitulary, recuback- and stress-moden effects 441

biochemical characterization, 433	cortical 5-HT $_2$ and striatal pK $_i$ values (table), 593
CRF-like immunoreactivity (fig.), 460	pED_{50} (table), 594
distribution, 428	RMI-81582, pK_i values (table), 592
localization, 433	RNA, messenger
localization, pituitary and brain, 433	corticotropin-releasing factor peptide, 428
signal transduction, second messenger systems, 434	corticotroptin-releasing factor, insulin-induced hypoglycemia (fig.),
excitatory amino acid, modulators, 12	441
GABA, organization and function, 41	localization of corticotropin-releasing factor, 432
GABA, protein phosphorylation, 320	RO 363, beta adrenoceptors, 214
GABA _B , agonists, 6	Ro 14-7437, Purkinje neuron responses (fig.), 45
G-protein coupled, 321	Ruffolo, Robert R., Jr., Andrew J. Nichols, Jeffrey M. Stadel, and J.
schematic model (fig.), 494	Paul Hieble. Structure and function of α -adrenoceptors, 475 Ruthenium red, functional antagonist of capsaicin, 182
growth factor, 312	reuthernum reu, runctional antagonist of capsaicin, 102
5-HT ₂	SCH 23390, pK _i values (table), 592
down-regulation, 594	Schizophrenia
pK _i values, atypical psychotics (table), 592	cerebrospinal fluid CRF-like immunoreactivity (fig.), 459
5-HT ₃ , 582 agents (table), 583	mechanism of action of antipsychotics, 588
antagonism, antipsychotic drugs, 598	serotonin, 519
computational model (table), 584	studies of m-chlorophenylpiperazine, 531
5-HT _{1A} , azapirones, 541	Serine
5-hydroxyindoleacetic acid, subtypes, 515	protein phosphatases, 312
influence on development, 555	protein phosphatases in brain (table), 312
intracellular, 322	Serotonin
ion channel-coupled, 319	Alzheimer's disease, 519
isolation, binding studies, 5-hydroxytryptamine, 259	cholinergic interactions, 520
muscarinic acetylcholine, 321	dopamine and, 520
neurotransmitter	neuroanatomical relationship, 589
DHE and sumatriptan interactions (table), 581	false neurotransmitter hypothesis, 39
serotonin, brain development and pharmacology, 553	feedback control, 575 function
nicotinic acetylcholine, 319	affective and personality disorders, 511
occupancy, positive inotropic effect, isoprenaline (fig.), 226	other psychiatric disorders, 516
plasma membrane, regulation, protein phosphorylation (table), 320	glucoregulation, 571
platelet-activating factor, agonists and antagonists (fig.), 268	innervation, nigrostriatal and mesolimbic pathways, 590
platelet (fig.), 283	mechanism of action of antipsychotics, 588
platelet (table), 282	-mediated behaviors, antipsychotic drugs, 597
presynaptic, nerve terminal phosphoproteins, 319	mesolimbic dopamine pathways, 597
programmable, 555	neuroleptic-induced catalepsy, 595
prostaglandin, agonists (fig.), 281	neuron, extracellular action potential (fig.), 564
regulation of function, 319	neuropsychiatric disorders and, 507
serotonin, see also 5-HT	neurotransmitter interaction, 516
agonists, neuroendocrine responses, 513	other neurotransmitter receptors and, brain development, develop-
antagonism, atypical antipsychotics, 598	mental pharmacology, 553
binding properties of antipsychotics, 592	overview of neuropsychiatric disorders, 510
effects, antipsychotic drugs, 587	pharmacological implications, 521
"families", 590	physiological regulation, 569
physiological effects, 543	postsynaptic receptor responsiveness, 515
subtypes, 591 subtypes, neuropsychiatric diseases, 579	precursors, neuroendocrine responses, 512
subtypes, neuropsychiatric diseases, 579 subtypes, physiological effects, 534	regulation of dopaminergic function, 595
spare, beta adrenoceptor agonists, heart, 224	role in psychiatric disorders, 509
stimulatory agonists, adenosine 5'-diphosphate, 250	schizophrenia, 519 -selective arylpiperazines, effects in humans, 527
target tissues, 556	uptake in platelets, 512
thromboxane A ₂ , agonists and antagonists (fig.), 263	Serotonin receptor agonists, neuroendocrine responses, 513
tyrosine kinase-coupled, 322	Sertindole, cortical 5-HT ₂ and striatal pK _i values (table), 593
vasopressin, subtypes, antagonists, 92	Setoperone, pK _i values (table), 592
Renzapride, antiemesis, 582	Sexual function, m-chlorophenylpiperazine, 538
Reproductive hormone, function, corticotropin-releasing factor, 442	Shunt, portal-systemic, reduction, hepatic encephalopathy, 54
Reserpine, corticotropin-releasing factor, actions on HPA axis, 443	Siever, Larry J., René S. Kahn, Brian A. Lawlor, Robert L. Trestman,
Resiniferatoxin	Timothy L. Lawrence, and Emil F. Coccaro. Critical issues in
capsaicin and, chemical structure (fig.), 145	defining the role of serotonin in psychiatric disorders, 509
potent capsaicin agonist, 171	Skolnick, P. See Basile et al., 27
Respiration	Sleep
activity of DRN 5-HT neurons (fig.), 571	m-chlorophenylpiperazine, 538
depression, cGMP levels, 3	REM, wakefulness transition, NCS 5-HT neuron (fig.), 566
Rilapine, pK _i values (table), 592	-wake-arousal continuum, 5-HT neurons (fig.), 566
Risperidone	-wake-arousal cycle, 564

-wake cycle, DRN 5-HT neuron (fig.), 565	osmolality, pitressin (fig.), 89
SM-9018, cortical 5-HT ₂ and striatal pK _i values (table), 593	V ₂ antagonist (fig.), 88
Sodium, -hydrogen exchange, 487	vasopressin antagonists (fig.), 87
transduction, α_2 -adrenoceptors and platelets (fig.), 488	· usop: • • • • • • • • • • • • • • • • • • •
Sodium channels, voltage-sensitive, 323	Vasculature, nitric oxide, 110, 129
	Vasodilation
Sodium chloride, calcium and, intracellular accumulation, neurotoxic-	
ity, 181	induced by nitrate esters, 354
Stadel, Jeffrey M. See Ruffolo et al., 475	nitrate esters, 356
Stress	Vasodilators, other antianginal drugs and, drug interactions, nitrates,
alprazolam and, corticotropin-releasing factor concentrations (fig.),	407
455	Vasopressin
	-
brain 5-HT, 568	antagonists
corticotropin-releasing factor neurons, 453	antidiuretic responses (table), 77
drug and behavioral effects, cerebellar cGMP, 3	antidiuretic responses, 76
secondary effects, 453	bioassay, definition of antagonist potency, 75
Suicide, controls and, composite Scatchard analysis, frontal cortical	
	central and peripheral circulation, 78
sample (fig.), 460	change in urine excretion (fig.), 87
Sulfhydryl, replenishment, tolerance, organic nitrates, 402	chemical structure and biological activity, 75
Sumatriptan	chemical structure of d(CH ₂) ₅ Tyr(Me)AVP (fig.), 77
biochemical and neurochemical effects, 581	
clinical efficacy (table), 580	chemical structure of V_2 antagonists (fig.), 77
clinical studies, 579	elevated plasma arginine-vasopressin levels, 96
	pharmacology and clinical perspectives, 73
DHE and, neurotransmitter receptor (table), 581	physiological and pathophysiological roles, 78
history of (table), 579	
pharmacology of, 580	potency, 76
side effect profile (table), 580	pressor responses, 76
Synapsins	release, adrenocorticotrophic hormone, 90
· ·	serum osmolality, water content of brain (table), 90
regulation of neurotransmitter release, 314	
variants and alcoholism, 329	serum sodium level, pitressin (fig.), 89
Trahamadia	sodium excretion (fig.), 89
Tachycardia	synthesis, 75
atenolol and propranolol (fig.), 212	therapeutic effects, 97
salbutamol-induced, practolol or propranolol (fig.), 213	
Tau factor	treatment, clinical significance, 95
microtubule function, 332	urine excretion and osmolality, pitressin (fig.), 89
phosphorylation, neurofibrillary tangles, 332	urine excretion (fig.), 88
_	V ₂ and V ₁ antagonists with opening rings (fig.), 79
Temperature	
brain, DRN 5-HT neuron (fig.), 572	vasopressor responses (table), 77
m-chlorophenylpiperazine, 534	water metabolism, 86
physiological effects, serotonin receptors, 543	binding studies and receptor isolation, 261
serotonin-selective arylpiperazines, 527	structure-activity relationships, 261
	- · · · · · · · · · · · · · · · · · · ·
Tenilapine, pK; values (table), 592	Visual-evoked response
1,2,3,4-Tetranitratobutan, concentration-effect curve (fig.), 355	abnormalities (fig.), 43
Thermoregulation, brain 5-HT, 570	GABA/benzodiazepine receptor complex, 42
Thioridazine, pED ₅₀ (table), 594	• • •
Threitol tetranitrate, concentration-effect curve (fig.), 355	Walaas, Sven Ivar and Paul Greengard. Protein phosphorylation and
Threonine, -specific protein phosphatases, 312	neuronal function, 299
brain (table), 312	Water
Thrombin, blood platelet receptors, 271	content of brain, serum osmolality, vasopressin antagonist (table),
Thromboxane, prostaglandins and, 262	90
Thromboxane A ₂ , Na ⁺ /H ⁺ exchange, alpha adrenoceptors, platelets	metabolism, role, V ₂ antagonists, 86
(fig.), 488	
	Whitaker-Azmitia, Patricia M. Role of serotonin and other neurotrans-
Thyrotropin-releasing hormone, analogues, 18	mitter receptors in brain development: Basis for developmental
Tiospirone	pharmacology, 553
pED_{50} (table), 594	Wilker, Jeffrey C. and Wilmot, Carole A. Serotonin and neuropsychi-
pK _i values (table), 592	
Torfgård, Kristina. See Ahlner et al., 351	atric disorders, 507
Trestman, Robert L. See Siever et al., 509	Wilmot, Carole A. See Wilker et al., 507
	Wood, Paul L. Pharmacology of the second messenger, cyclic guanosine
TRH peptides, cerebellar cGMP (table), 9	3',5'-monophosphate, in the cerebellum, 1
Trinitro toluene, chemical structure of organic nitrate esters (fig.), 353	- ,- monophoropino, m one outournam, t
Tryptophan, plasma, 511	Xamoterol, beta adrenoceptors, 214
Tubulin, phosphorylation by cAMP-dependent protein kinase, 332	
Tyrosine, -specific protein phosphatases, 313	Yohimbine, binding, competition by agonists and antagonists (table),
	498
Tyrosine hydroxylase, regulation of neurotransmitter synthesis, 314	4 0 0
Urine	5 11 W 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1/11/15	Zaconride clinical status (table) 583
excretion	Zacopride, clinical status (table), 583 Zotepine, pK _i values (table), 592