## **Author Index**

A

Anderson, David J., 97

В

Bhandari, Komal, 25 Bonci, Antonello, 173 Boyden, Edward, 239

C

Caroni, Pico, 25 Chowdhury, Ananya, 25 Cui, Yihui, 141 Cummings, Damian M., 151

D

Dan, Yang, 243 Delevich, Kristen, 37 Ding, Keke, 97 Dolmetsch, Ricardo E., 185, 246 Dong, Yiyan, 141

E

Edwards, Frances A., 151

F

Falcon, Benjamin, 163 Frost Bellgowan, Julie A., 1

G

Ghetti, Bernardino, 163 Glimcher, Paul, 249 Goedert, Michel, 163, 252 Gordon, Joshua A., 1, 255 Grant, Seth G.N., 45

Н

Hu, Hailan, 141

Ι

Izqquierdo, Pablo, 151

 $\mathbf{J}$ 

Joel, Zelah, 151

K

Kaur, Satvinder, 63 Kepecs, Adam, 9, 219, 258 Kishida, Kenneth T., 71 Klawonn, Robert C., 119

 $\mathbf{L}$ 

Lawhorn, Collene, 1 Lee, Brian J., 17 Lee, Darrin J., 201 Leshan, Rebecca, 239, 243, 249, 268, 287 Lozano, Andres M., 201

M

Madeo, Graziella, 173 Malenka, Robert C., 119, 261 Massett, Paul, 9 Mayberg, Helen, 264 McKnight, Steven L., 207 Mews, Philipp, 131 Montague, P. Read, 71, 229, 268 Mukherjee, Arghya, 25

N

Namkung, Ho, 17 Nestler, Eric J., 131

0

Ott, Torben, 9

P

Pieper, Andrew A., 207 Platt, Michael, 272

R

Richardson, Jill C., 151

S Saawa, Akira, 17

Salih, Dervis A., 151
Saper, Clifford B., 63
Schaffer, Matthew, 105
Scheinert, Rachel B., 1
Scheres, Sjors H. W., 163
Schiller, Daniela, 105, 275
Sehgal, Amita, 57
Shi, Mi, 57
Small, Scott A., 193, 277
Stevens, Beth, 280
Stix, Gary, 246, 261, 284
Sun, Yishan, 185

Swanson, Larry W., 193

T

Thomas, A. Wren, 37 Thuault, Sébastien, 258, 264 Toda, Hirofumi, 57 Tripodi, Matteo, 25 Tsai, Li-Huei, 284 Tye, Kay, 287

U

Uchida, Naoshigi, 83

 $\mathbf{V}$ 

Vyas, Sejal, 277, 280, 290

W

Walker, Deena M., 131 Watabe-Uchida, Mitsuko, 83 Wilbrecht, Linda, 37 Williams, Julie A., 57 Witkowski, Jan, 252, 255, 272, 275, 293

Y

Yang, Yan, 141 Yanik, Mehmet Fatih, 290

 $\mathbf{Z}$ 

Zelikowsky, Moriel, 97 Zhang, Wenjuan, 163 Zoghbi, Huda, 293

This is a free sample of content from Cold Spring Harbor Symposium on Quantitative Biology. Volume LXXXIII: Brains and Behavior: Order and Disorder in the Nervous System. Click here for more information on how to buy the book.					

## Subject Index

A	BRAIN Initiative, 6	connectivity, 84–85
AD. See Alzheimer's disease		function, 87–90
Addiction. See Substance abuse	C	noncanonical signaling, 84
ADI. See Autism Diagnostic Interview	G 1 1 1 1 1 1 (GGDD)	striatum compartmentalization based on
ADI. See Artificial intelligence	Calcitonin gene-related peptide (CGRP),	dopamine signals, 91–93
AlphaGo, 233	apnea arousal circuitry, 66	Dravet syndrome
*	Cannabidiol (CBD), effects in Dravet	cannabidiol effects in cell culture model
Altruism, 274 Alzheimer's disease (AD)	syndrome cell culture model,	calcium assay, 190
APP expression modulation, 294–295	185–190	cortical neuron culture, 189–190
	Categorical approach, brain disorder	electrphysiology, 190
deep brain stimulation studies fornix, 202–203	modeling, 18	findings, 186–189
mechanism of action, 204	CBD. See Cannabidiol	induced pluripotent stem cell
Papez circuit, 201–202	CD47, 281–282	generation and
	CGRP. See Calcitonin gene-related peptide	differentiation, 190
prospects, 204 striatum, 203–204	Confidence	overview, 185, 247
	metacognition studies, 14–15	SCN1A mutations, 185
entorhinal-perirhinal borderzone	neural mechanisms, 13-14	Drop-seq, 280
vulnerability	neurons	Drug abuse. See Substance abuse
connectivity pattern, 194–195	classification, 13	
network hypothesis	identification, 12–13	E
anatomical spread, 197–198	overview, 9–10	_
regional vulnerability, 195–197	statistical decision confidence	Ecstasy
overview, 193–194, 277	human studies, 12	clinical applications, 263
prospects for study, 198	theory, 10–11	serotonin transporter binding, 263
light therapy, 285–286	Confidence. See Decision confidence	EEG. See Electroencephalography
mouse models	Corticotropin-releasing hormone (CRH),	Elastic net electrochemistry. See
APP overexpression, 152	social isolation stress role, 101	Electrochemical detection,
behavioral deficits, 153	CRH. See Corticotropin-releasing hormone	neurotransmitters
overexpression artifacts, 152–153		Electrochemical detection,
overview, 151–152	D	neurotransmitters
PSEN1/2 overexpression, 152	D	elastic net electrochemistry
Tau overexpression	DBS. See Deep brain stimulation	multianalyte analysis, 75–76
overview, 153–154	Decision confidence, 258–260	principles, 72–75
prospects, 158–159	Deep Blue, 229-230	striatum studies during active
toxicity threshold, 154, 156	Deep brain stimulation (DBS)	investment game, 76–79
structural studies, 252-253	Alzheimer's disease studies	overview, 71–72
tau conformers, 166–167	fornix, 202–203	reward prediction error hypothesis
Anxiety. See Social anxiety disorder	mechanism of action, 204	testing, 80–81
Apnea. See Obstructive sleep apnea	Papez circuit, 201–202	Electroencephalography (EEG), sleep
APOE4, 197	prospects, 204	studies, 244
APP. See Alzheimer's disease, 152	striatum, 203–204	Entorhinal-perirhinal borderzone. See
Artificial intelligence (AI), 242, 268, 274,	applications, 222, 264-267	Alzheimer's disease
292	depression studies, 264-267	Epilepsy. See also Dravet syndrome
ASD. See Autism spectrum disorder	Parkinson's disease, 264–267	light-emitting diode therapy, 285
Autism Diagnostic Interview (ADI), 235	Depression. See Major depressive disorder	zebrafish model, 290
Autism spectrum disorder (ASD)	Dimensional approach, brain disorder	EPSC. See Excitatory postsynaptic current
approaches to study, 247-248	modeling, 18-19	Essential tremor, 269
hippocampal abnormalities, 109-110	Dopamine. See also Electrochemical	Excitatory postsynaptic current (EPSC),
social dysfunction, 109	detection, neurotransmitters;	49, 51
social mapping impairment, 110	Nucleus accumbens;	
zebrafish model, 290	Reward prediction error;	F
	Striatum	-
В	canonical signaling, 83-84	fMRI. See Functional magnetic resonance
	measurement in brain, 233-234	imaging
Biomarkers, discovery for psychiatric	neuron diversity	Fornix, deep brain stimulation in Alz-
disease, 2	activity, 85-88	heimer's disease, 202–203

Brains and Behavior: Order and Disorder in the Nervous System. Click here for more information on how to buy the book. SUBJECT INDEX

300

deep brain stimulation studies, 264-267 Functional magnetic resonance imaging neuropeptide modulation, 124-125 (fMRI) habenula studies serotonin actions, 123-124 decision-making studies, 250 bursting activity Nucleus of the solitary tract (NTS), apnea increase in animal models of depression subtypes, 4 arousal circuitry, 63-64 social space studies, 275 depression, 143-144 trust game, 234 ionic mechanism, 144-146 ketamine targeting, 144 Kir4.1 Obsessive-compulsive disorder (OCD), G bidirectional modulation, deep brain stimulation, 266 GAD67, 26-27 142-143 Obstructive sleep apnea (OSA) Galanin, nucleus accumbens actions, 125 bursting activity regulation, arousal circuitry, 63-69 Gamma oscillations, modulation, 285-286 146-148 treatment, 63 upregulation in astroglia, 142 Gaze, monkeys versus humans in game OCD. See Obsessive-compulsive disorder hippocampal abnormalities, 111 play, 274 OFC. See Orbitofrontal cortex social dysfunction, 110-111 Genome-wide association study (GWAS) Opioid signaling, nucleus accumbens, social mapping impairment, 111 prospects, 2 124-125 psychiatric disease mechanism MAPT. See Tau Orbitofrontal cortex (OFC), decision MDD. See Major depressive disorder identification, 17-18, 20 confidence studies, 259 GWAS. See Genome-wide association study MDMA. See Ecstasy Orexin, nucleus accumbens actions, 125 MECP2, 295 OSA. See Obstructive sleep apnea Melanocortin, nucleus accumbens Oxytocin, 125, 262 Н actions, 125 Habenula Mendelian randomization (MR), 20 P lateral habenula function, 141 Microglia, 280-283 major depressive disorder studies MR. See Mendelian randomization P7C3 bursting activity MS. See Multiple sclerosis discovery, 211 increase in animal models of Multiple sclerosis (MS), 247 mechanism of neuroprotection, depression, 143-144 Multivesicular body (MVB), fusion in 211-212 ionic mechanism, 144-146 Alzheimer's disease, 196 Papez circuit, deep brain stimulation in ketamine targeting, 144 MVB. See Multivesicular body Alzheimer's disease, Kir41 201-202 bidirectional modulation. Parabrachial nucleus (PB), apnea arousal N 142-143 circuitry, 63-68 bursting activity regulation, Nac. See Nucleus accumbens Parkinson's disease (PD) 146-148 nAchR. See Nicotinic aceylcholine receptor deep brain stimulation, 264-267 upregulation in astroglia, 142 NAD<sup>+</sup>. See Nicotinamide adenine electrochemical detection of Hebb's rule, 232 dinucleotide neurotransmitters in striatum Hippocampus nemuri during active investment autism spectrum disorder abnormalities, antimicrobial peptide product, 59 game, 76-79 109-110 overexpression and sleep induction, honeybee neurons, 230 functional overview, 105-106 58-59 Parvalbumunin (PV) interneuron major depressive disorder sleep deprivation induction, 59-60 plasticity abnormalities, 111 Neuroeconomics, 249-250 delayed onset, 28-29 schizophrenia abnormalities, 108-109 Nicotinamide adenine dinucleotide (NAD+) neuron subpopulations in social anxiety disorder abnormalities, 112 neuron protection overview, 207 implementation, 27-28 social mapping neural mechanisms, 107 P7C3 effects, 211-212 overview, 25 social navigation, 107 SARM1 as hydroxylase, 211 persistence, 28-29 social space mapping, 106-107 Nicotinic aceylcholine receptor (nAchR), prospects for study, 32-33 Hippocampus. See also Fornix provisional and definite reinforced sleep mutants in Drosophila, 58 learning, 25-27 K Norepinephrine. See Electrochemical time windows acquisition for consolidation, detection, neurotransmitters Ketamine, antidepressant actions in NTS. See Nucleus of the solitary tract 29-30 habenula, 144 Nucleus accumbens (NAc) plasticity-dependent Kir4.1. See Habenula dopamine actions, 121-123 consolidation, 30-32 drug addiction research applications, 3  $\mathbf{L}$ gene expression long-lasting PB. See Parabrachial nucleus changes, 133-134 PD See Parkinson's disease LED. See Light-emitting diode PFC. See Prefrontal cortex medium spiny neurons, 137-138 Levetiracetam, 285 plasticity changes, 132-133 Pick's disease, tau conformers, 167-169 Light-emitting diode (LED), therapy, excitatory inputs, 120-121 Plasticity 285-286 expectation studies, 256 nucleus accumbens and drug addiction medium spiny neurons expressing D1 changes, 132-133 M and D2 receptors, 119-120, parvalbumunin interneuron plasticity Major depressive disorder (MDD) delayed onset, 28-29

neuron subpopulations in	function, 210-211	learning from different outcomes
implementation, 27–28	neuroprotection, 211	algorithm, 90
overview, 25	structure, 210–211	Substance abuse
persistence, 28–29	Schizophrenia	brain reward region corruption,
prospects for study, 32–33	developmental trajectory of molecular	131–132, 262
provisional and definite reinforced	pathways, 19–20	chromatin regulation, 135-136
learning, 25–27	hippocampal abnormalities,	neuroplastic changes, 287
time windows	108–109	nucleus accumbens and addiction
acquisition for consolidation,	social dysfunction, 108-109	gene expression long-lasting
29–30	social mapping impairment, 109	changes, 133–134
plasticity-dependent consolida-	SCN1A. See Dravet syndrome	medium spiny neurons expressing
tion, 30–32	Selective serotonin reuptake inhibitors	D1 and D2 receptors,
synaptic plasticity mechanisms,	(SSRIs), 230, 264	137–138
261–262	Serotonin. See also Electrochemical	plasticity changes, 132-133
transcranial magnetic stimulation	detection,	transcranial magnetic stimulation for
neuroplasticity mechanisms,	neurotransmitters;	addiction
174–175	Nucleus accumbens	clinical studies, 176-181
Polygenic risk score (PRS), 21	measurement in brain, 233–234	neurobiology, 174-175
Postsynaptic proteome. See Synaptomic	transporter binding by Ecstasy, 263	overview, 173–174
theory	Sleep	preclinical studies, 175-176
Posttraumatic stress disorder (PTSD),	Drosophila models	prospects, 176, 182
diagnosis, 1	advantages, 57–58	transcriptional priming, 131
Prefrontal cortex (PFC)	forward genetic screens of sleep	Synaptomic theory, behavior
adolescence studies	mutants, 58	defining features, 49
axonal bouton changes, 40-41	nemuri	evolution of theory, 53
dendritic spine dynamics in	antimicrobial peptide	learning and long-term potentiation,
puberty, 39	product, 59	51–52
inhibitory neurotransmission	overexpression and sleep	map response to patterns of activity,
onto pyrimidal neurons,	induction, 58–59	49–51
39–40	sleep deprivation induction,	mapping
dendritic spine maturation, 37–38	59–60	complex responses, 53-54
transcranial magnetic stimulation	drug development, 244	synapse diversity, 46–47
effects in addiction, 173,	REM sleep, 243	mutation and disease, 52-53
175–176	SMN1, 293	overview, 45
Prion disease, 253–254	SMN2, 293	postsynaptic proteome
PRS. See Polygenic risk score	Social anxiety disorder (SAD)	innate and learned behavior
PSD95, 46–48	hippocampal abnormalities, 112 social dysfunction, 111–112	control, 48
PSEN1/2. See Alzheimer's disease, 152	social mapping impairment, 112	molecular complexity, 46
PTSD. See Posttraumatic stress disorder	Social isolation stress	organization, 46
PV interneuron. See Parvalbumunin	brain changes in mice after prolonged	origins, 48–49
interneuron	isolation, 100	prospects, 54
	corticotropin-releasing hormone	repertoire of behaviors, 52
Q	role, 101	timescales and synaptic strength, 47
_	neuropeptide mediation of internal	SYNGAP1, 222
Q-learning, 232	state, 97–98	
QTL. See Quantitative trait loci	tachykinin control	Т
Quantitative trait loci (QTL), psychiatric	Drosophila, 98–99	1
disease mechanism	mice, 99–100	Tachykinin
identification, 20–21	other stress responses, 101	social isolation stress control
	prospects for study, 101–102	Drosophila, 98–99
R	Tac2 role, 100–101	mice, 99-100
K	SORL1, 196, 278	prospects for study, 101-102
Rett syndrome, 295	SSRIs. See Selective serotonin reuptake	Tac2 role, 100-101
Reward prediction error	inhibitors	stress response roles, 101
dopamine signaling, 83–84	Stress. See Social isolation stress	Tau. See also Alzheimer's disease
hypothesis testing with electrochemical	Striatum	Conformers
detection of brain	compartmentalization based on	Alzheimer's disease,
neurotransmitters, 80-81	dopamine signals,	166–167
	91–93	Pick's disease, 167–169
S	deep brain stimulation in Alzheimer's	filament assembly, 165
	disease, 203–204	isoforms, 164–165
SAD. See Social anxiety disorder	electrochemical detection of	<i>MAPT</i> genetics, 165–166
SAP102, 46	neurotransmitters during	structure, 163–164
SARM1	active investment game,	TMS. See Transcranial magnetic

76-79

stimulation

discovery, 210

This is a free sample of content from Cold Spring Harbor Symposium on Quantitative Biology. Volume LXXXIII:

Brains and Behavior: Order and Disorder in the Nervous System. Click here for more information on how to buy the book. 302 SUBJECT INDEX

Transcranial magnetic stimulation (TMS) addiction studies clinical studies, 176-181 overview, 173-174 preclinical studies, 175-176 prospects, 176, 182

applications, 222

Dravet syndrome, 185 neuroplasticity mechanisms, 174-175 repetitive, 5

V

Ventrolateral medulla (VLM), apnea arousal circuitry, 63-64, 66

VLM. See Ventrolateral medulla VPS35, 196

 $\mathbf{W}$ 

Wallerian degeneration P7C3 protection, 212 slow mice, 207-210