TABLE OF CONTENTS

List	of Contributors	X
1.	Sex Differences in Immunity and Inflammation: Implications for Brain and Behavior	1
	Gretchen N. Neigh, Christina L. Nemeth, Sydney A. Rowson	
	 1 Introduction 2 Sex-dependent baseline differences in immune functioning and response 3 Sex-dependent differences within the central nervous system 4 Mechanisms of sex-dependent immune activity 5 Consequences of sex differences within central nervous system trauma and disease 6 Conclusions Acknowledgment 	11 4 9 11 18 22 22
	References	22
2.	Molecular Mechanisms of Memory in Males and Females Ashley A. Keiser, Natalie C. Tronson	27
	1 Introduction	27
	2 Molecular mechanisms underlying memory formation 3 Conclusions References	28
3.	Sex Differences in Anxiety Disorders: Gonadal Hormone Interactions with Pathophysiology, Neurobiology, and Treatment	53
	Lisa Y. Maeng, Mohammed R. Milad	
	1 Introduction 2 Sex differences in anxiety disorders	53
	3 Neurobiology of fear extinction	54
	4 Sex differences in fear extinction	56
	5 Estrogen	58
	6 Other gonadal hormones	65
	7 Conclusions	66
	Acknowledgments References	67

4.	Sex Differences in the Social Behavior Network and Mesolimbic Dopamine System	77
	Gian D. Greenberg, Brian C. Trainor	
	 Introduction to sex differences in social behavior and the importance of sex-specific responses in neural circuitry The social behavior network and sex differences in social behavior 	77 78
	3 The mesolimbic dopamine system	89
	4 Connectivity between social behavior network and the mesolimbic dopamine system 5 Conclusions	94 96
	Acknowledgment References	96 96
5.	Sexual Dimorphisms in Psychosis Risk: A Neurodevelopmental Perspective Deborah J. Walder, Beril Yaffe, Yosefa Ehrlich	107
	1 Introduction	107
	2 Theoretical conceptualizations	107
	3 Sex differences in clinical phenomenology and functioning	110
	4 Sex differences in cognition	110
	5 Sex differences in other neurobiological precursors	113
	6 Conclusions	119
	References	120
6.	Sex Differences and Addiction	129
	Adam N. Perry, Christel Westenbroek, Jill B. Becker	
	1 Introduction	129
	2 Sex differences in addiction in humans	130
	3 Sex differences in addiction in preclinical studies	134
	4 Sex differences in the mechanisms of addiction	134
	5 Sex differences in preclinical research6 New animal models to study addiction are needed	137 139
	7 Conclusions	142
	Acknowledgments	142
	References	143
7.	Stress and Emotional Learning in Humans: Evidence for Sex Differences	149
	Christian J. Merz, Oliver T. Wolf	
	1 Introduction	149
	2 Episodic memory	153
	3 Fear conditioning	160

	4 General conclusions and suggestions for future work	165
	Acknowledgments	166
	References	166
8.	Biological Underpinnings of Sex Differences in Eating Disorders	171
	Kristen M. Culbert, Sarah E. Racine, Kelly L. Klump	
	1 Introduction	171
	2 Behavior genetics: sex-differentiated genetic risk for eating pathology	174
	3 Gonadal hormones and sex-differentiated risk for eating pathology	179
	4 Appetite-regulating hormones: implications for eating pathology?	188
	5 Brain imaging: sex-differentiated risk for disordered eating	189
	6 Conclusions	190
	References	190
0	The Maternal Brain: Short- and Long-Term Effects of	
9.	Reproductive Experience on Hippocampus Structure and	
	Function in Adulthood	197
	Meighen Roes, Liisa A.M. Galea	
	1 Introduction	197
	2 Pregnancy and parturition: short-term changes in cognition and hippocampus	198
	3 Long-term changes in cognition with aging are altered by	
	reproductive factors and parity	204
	4 Greater endogenous ovarian hormone exposure may improve cognitive aging	206
	5 The hippocampus and Alzheimer's disease	209
	6 Reproductive experience and susceptibility to Alzheimer's disease	210
	7 Conclusions	213
	References	214
0.	Sex and the Developing Brain	221
	Jaclyn M. Schwarz	
	1 Introduction	221
	2 Sex determination and sexual differentiation of the brain	221
	3 The organization and activational hypothesis of sex differences	
	in the brain and behavior	223
	4 The mechanisms of steroid-induced sexual differentiation in the rodent brain are	hotol
	brain region specific	228
	5 The genetics and epigenetics of sex differences in the developing brain	235
	6 Conclusions References	239
	REIEIDICOC	1/1()

11.	Presence and Absence of Sex Differences in Structure and Function of the Brain Oxytocin System: Implications for Understanding the Regulation of Social Behavior	247
	Kelly M. Dumais, Alexa H. Veenema	
	1 Introduction	247
	2 Sex differences in the brain OT system	247
	3 Sexually dimorphic actions of OT on behavior and neural responses	260
	4 A note on OT as a therapeutic agent in men and women – advances and precautions	280
	5 Conclusions	283
	Acknowledgments	284
	References	284
12.	Sex Differences in Neurological Diseases	297
	Farida Sohrabji, C. Jane Welsh, Doodipala Samba Reddy	
	1 Introduction	297
	2 Ischemic stroke	297
	3 Multiple sclerosis	303
	4 Epilepsy	309
	5 Conclusions	315
	References	315
13.	Steroid Hormone Signaling Pathways and Sex Differences in Neuroendocrine and Behavioral Responses to Stress	325
	Mario G. Oyola, Anna M. Malysz, Shailaja K. Mani, Robert J. Handa	
	1 Introduction	325
	2 Mechanisms of steroid hormone action	328
	3 The hypothalamo–pituitary–adrenal axis	341
	4 Hormone secretory patterns	342
	5 Regulation of hormone secretion by steroid hormones	345
	6 Steroid metabolism and the regulation of the HPA axis	346
	7 The role of steroid hormones in mediating sex differences in anxiety and depression	351
	8 Conclusions	352
	References	353
14.	Sex Differences in Rodent Cognitive Processing and Responses to Chronic Stress	365
	Victoria N. Luine, Juan L. Gomez	
	1 Introduction	365
	2 Chronic stress effects on learning and memory are sex dependent in adults	366
	3 Mechanisms contributing to sex differences in response to stress	368

		Table of Contents
	4 Sex-dependent effects of stress on learning and memory across the lifespan	372
	5 Interactive effects of sex, stress, and alcohol on learning and memory	375
	6 Conclusions	380
	References	381
15.	Epigenetic Sex: Gene–Environment Contributions to Brain Sex Differences and their Impact on Mental Health Risk	385
	Anthony P. Auger	
	1 Introduction	385
	2 Sexual differentiation of the brain	385
	3 Emergence of epigenetic research	388
	4 Conclusions	397
	References	401
Sub	iect Index	405

ix