

# Contents

<b>Section 1 Neuroimmunity and neuroinflammation</b> .....	1
<i>João O. Malva and Catarina R. Oliveira</i>	
Chapter 1. Inflammation and Neuronal Susceptibility to Excitotoxic Cell Death .....	3
<i>Liliana Bernardino and João O. Malva</i>	
Chapter 2. Microglial Cell Population Expansion Following Acute Neural Injury .....	37
<i>M. Wirenfeldt, L. Dissing-Olesen, A.A. Babcock, R. Ladeby, M.B. Jensen, T. Owens and B. Finsen</i>	
Chapter 3. Opposite Modulation of Peripheral Inflammation and Neuroinflammation by Adenosine A <sub>2A</sub> Receptors .....	53
<i>Rodrigo A. Cunha, Jiang-Fan Chen and Michail V. Sitkovsky</i>	
Chapter 4. Subventricular Zone Cells as a Tool for Brain Repair .....	81
<i>Fabienne Agasse, Liliana Bernardino and João O. Malva</i>	
<b>Section 2 Signaling and inflammation in aging</b> .....	109
<i>Rodrigo A. Cunha</i>	
Chapter 5. Neuron-Glia Interaction in Homeostasis of the Neurotransmitters Glutamate and GABA .....	111
<i>Arne Schousboe and Helle S. Waagepetersen</i>	
Chapter 6. The Impact of an Imbalance Between Proinflammatory and Anti-inflammatory Influences on Synaptic Function in the Aged Brain .....	121
<i>Marina Lynch</i>	
Chapter 7. Neurotrophin Signaling and Cell Survival .....	137
<i>Bruno J. Manadas, Carlos V. Melo, João R. Gomes and Carlos B. Duarte</i>	
Chapter 8. GDNF: a Key Player in Neuron-Glia Crosstalk and Survival of Nigrostriatal Dopaminergic Neurons .....	173
<i>Emília P. Duarte, Ana Saavedra and Graça Baltazar</i>	

Chapter 9. Molecular Pathways of Mitochondrial Dysfunction in Neurodegeneration: the Paradigms of Parkinson's and Huntington's Diseases .....	193
<i>Ana Cristina Rego, Sandra Morais Cardoso and Catarina R. Oliveira</i>	
Chapter 10. Zinc Homeostasis and Brain Injury .....	221
<i>Stefano Sensi, Erica Rockabrand and Israel Sekler</i>	
Chapter 11. Aging and Cognitive Decline: Neuroprotective Strategies .....	245
<i>Frederico Simões do Couto and Alexandre de Mendonça</i>	
<b>Section 3 Neurodegeneration and inflammation in age related diseases .....</b>	<b>269</b>
<i>Ana Cristina Rego and Catarina R. Oliveira</i>	
Chapter 12. Inflammation and Apoptotic Pathways in the Peripheral Nervous System Related to Protein Misfolding .....	271
<i>Maria João Saraiva</i>	
Chapter 13. Neuroinflammation and Excitotoxicity in Neurobiology of HIV-1 Infection and AIDS: Targets for Neuroprotection .....	281
<i>Marcus Kaul and Stuart A. Lipton</i>	
Chapter 14. Neuroinflammation and Mitochondrial Dysfunction in Alzheimer's and Prion's Diseases .....	309
<i>Paula Agostinho and Catarina R. Oliveira</i>	
Chapter 15. Metal Ions and Alzheimer's Disease .....	333
<i>Paul A. Adlard and Ashley I. Bush</i>	
Chapter 16. Epilepsy, Brain Injury and Cell Death.....	363
<i>Günther Sperk, Meinrad Drexel, Ramon Tasan and Anna Wieselthaler</i>	
Chapter 17. Glia and Hippocampal Neurogenesis in the Normal, Aged and Epileptic Brain .....	375
<i>William P. Gray and Alexandra Laskowski</i>	
Chapter 18. Polyglutamine Expansion Diseases – the Case of Machado-Joseph Disease.....	391
<i>Sandra Macedo-Ribeiro, Luís Pereira de Almeida, Ana Luísa Carvalho and Ana Cristina Rego</i>	
Chapter 19. Remyelination of the Central Nervous System .....	427
<i>Charlotte C. Bruce, Robin J. M. Franklin and João B. Relvas</i>	
Chapter 20. Adult Neurogenesis in Neurodegenerative Diseases .....	445
<i>Tomas Deierborg, Jia-Yi Li and Patrik Brundin</i>	

Chapter 21. ATP Receptors in the Pain Signaling: Glial Contribution  
in Neuropathic Pain..... 461  
*Kazuhide Inoue*

Chapter 22. Diabetic Retinopathy, Inflammation, and Proteasome ..... 475  
*António F. Ambrósio, Paulo Pereira and José Cunha-Vaz*

Chapter 23. Rejuvenating Neurons and Glia with Microbial Enzymes ..... 503  
*Aubrey D.N.J. de Grey*

**Abbreviations** ..... 511

**Index**..... 513