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Function; 2.6 Conclusions and Outlook; Abbreviations; 3 Phox2a and Phox2b: Essential Transcription Factors for Neuron Specification and Differentiation; Abstract; 3.1 Introduction; 3.2 Molecular Characteristics of Phox2 Genes and Proteins; 3.2.1 Sequence and Gene Structure Conservation in the Animal Kingdom; 3.2.2 Transcriptional Activation by Phox2 Proteins; 3.3 Physiological Relevance of Phox2 Transcription Factors; 3.3.1 Expression Pattern; 3.3.2 Effects of Phox2 Gene Mutations
3.3.2.1 Autonomic Neural Crest Derivatives and Visceral Sensory Ganglia3.3.2.2 Central Noradrenergic Neurons; 3.3.2.3 Autonomic Centers in the Hindbrain; 3.3.3 Human Mutations; 3.4 Molecular Mechanism of Action in Different Lineages; 3.4.1 Sympathetic Neurons; 3.4.2 Parasympathetic Neurons; 3.4.3 Enteric Neurons; 3.4.4 Visceral Sensory Neurons of the Geniculate, Petrosal and Nodose Ganglia; 3.4.5 Central Noradrenergic Neurons; 3.4.6 Autonomic Centers in the Hindbrain; 3.4.6.1 Afferent Visceral Centers; 3.4.6.2 Efferent Visceral Centers; 3.4.7 Oculomotor (nIII) and Trochlear (nIV) Centers
3.5 Conclusions and Outlook3.5.1 Distinct or Identical Functions for Phox2a and Phox2b?; 3.5.2 Master Control Genes for Noradrenergic Differentiation; 3.5.3 Master Control Genes for Autonomic Reflex Circuit Generation; Acknowledgments; Abbreviations; 4 Functions of LIM-Homeodomain Proteins in the Development of the Nervous System; Abstract; 4.1 Introduction; 4.2 Common Structural Features and Classification of LIM-HD Proteins; 4.3 LIM-HD Proteins and the Development of Invertebrate Nervous Systems; 4.3.1 C. elegans; 4.3.2 Drosophila
4.4 Functions of LIM-HD Proteins in the Development of Vertebrate Nervous Systems

Sommario/riassunto

This first book to cover neural development, neuronal survival and function on the genetic level outlines promising approaches for novel therapeutic strategies in fighting neurodegenerative disorders, such as Alzheimer's disease. Focusing on transcription factors, the text is clearly divided into three sections devoted to transcriptional control of neural development, brain function and transcriptional dysregulation induced neurological diseases.With a chapter written by Nobel laureate Eric Kandel, this is essential reading for neurobiologists, geneticists, biochemists, cell biologists, ne