1. Record Nr. UNINA9910796063103321

Autore	Andreatta Richard D
Titolo	Neuroscience Fundamentals for Communication Sciences and Disorders
Pubbl/distr/stampa	San Diego : , : Plural Publishing, Incorporated, , 2022 ©2024
ISBN	9781635503609 9781635503593
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (833 pages)
Disciplina	612.8/2
Soggetti	Central Nervous System - physiology Central Nervous System - anatomy & histology Sensation - physiology Perception - physiology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Preface -- About the Illustrator: Maury Aaseng -- Contributors -- Reviewers -- Acknowledgments -- Section 1. Neuroanatomical and Neurophysiological Foundations -- Chapter 1. Introduction and Organization of Neuroscience Fundamentals in Communication Sciences and Disorders -- What Is Neuroscience? -- What Is This Book About? -- The View From 30,000 Feet Up -- Overview of Section 1: Neuroanatomical and Neurophysiological Foundations -- Overview of Section 2: Sensory Systems -- Overview of Section 3: Motor Systems -- Overview of Section 4: Neural Substrates of -- Speech, Language, and Hearing Study Strategies and Tips -- Closing Thoughts -- Chapter 2. Basic Structure and Function of Neurons -- Introduction and Learning Objectives -- Discovery of Two Classes of Cells in the Nervous System -- The Neuron -- Neurons Are Made for Signaling and Communication -- Neurons Never Function Alone -- Neurons Perform Fundamental Activities -- Reflexes Provide a Window Into the Fundamental Operation of Neural Networks -- Nerve Cells Have Different Shapes, Sizes, and Functions -- Structural Features of the Neuron -- Soma, Cell Membrane, and Cytoskeleton -- Cytoplasm -- Mitochondria -- Smooth and Rough Endoplasmic Reticulum -- Golgi

Apparatus -- The Nucleus Mediates the Process of Gene Expression -- Axons and Dendrites -- The Glial Cell -- Glial Cells Are Divided Into Two Major Functional Groups -- Conclusion -- The Top Ten List -- Chapter 2 Abbreviations -- Study Questions and Activities -- References -- Chapter 3. Basics of Neural Signaling and Synaptic Function -- Introduction and Learning Objectives -- Foundations of Neural Signaling: The Nature of Information in the Nervous System -- Electronics 101 -- Gradients: Putting Substances Into Motion -- Developing an Electrical Gradient -- Voltage, Current, and Resistance. The Fluid Environment of the Neuron: Intracellular and Extracellular Composition -- Ion Channels: Tunnels Across the Neuron's Cell Membrane -- Ion Channels Can Control the Motion of Ions -- Ion Channels Can Gate Ionic Current in Three Ways -- Some Ion Channels Are Always Open -- Ion Pumps Are Active Transporters of Ions Across the Neuron's Cell Membrane -- Understanding Membrane Potentials -- Membrane Voltages Are Created by a Separation of Charges -- Vm Can Be Changed by Ionic Gradients and Currents -- Development of the Neuron's Resting Membrane Potential -- The Action Potential -- Voltage-Gated Ion Channels Are Chiefly Responsible for AP Generation -- Voltage-Gated Na+ and K+ Channels Differ in Their Opening Speed -- The Action Potential in "Action" -- Propagation of the Action Potential Down the Axon -- Synapses: The Point of Communication Between Neurons -- Electrical Synapses Allow for Virtually Instantaneous Signal Transmission -- Chemical Synapses: The Workhorse of the Nervous System -- Structure of the Chemical Synapse -- Chemical Synapse Function: Transmission Phase -- Chemical Synapse Function: Receptive Phase -- Postsynaptic Receptors Belong to Two Different Functional Classes -- Ending Chemical Synaptic Transmission: "Cleaning Up After the Party" -- Neurotransmitters Can Be Divided Into a Handful of Chemical Classes -- A Few Final Words on Neurotransmission -- Neural Integration: Closing (and Opening) the Neural Signaling Loop -- The "Government Analogy" of Neural Integration in the Postsynaptic Cell -- Concluding Thoughts on Neurobiology -- The Top Ten List -- Chapter 3 Abbreviations -- Study Questions and Activities -- References -- Chapter 4. Neuroanatomy of the Human Nervous System: Anatomical Nomenclature, Embryology, the Spinal Cord, and the Brainstem -- Introduction and Learning Objectives.
Getting Around the Nervous System: Anatomical Planes and Orientations -- Anatomical Orientations -- Anatomical Planes -- Gray Versus White Matter in the Nervous System -- Gray Matter in the CNS and PNS -- White Matter Consists of Bundles of Axons -- A Brief Tour of the Embryologic Development of the Nervous System -- The Human Embryo Is a Multilayered Collection of Cells -- Neural Crest and Neural Tube Cells Differentiate Into the PNS and CNS -- Major Anatomical Structures and Functions of the Human Central Nervous System -- The Skull and Vertebral Column House and -- Protect the Tissues of the CNS The Spinal Cord -- External Spinal Cord Structures -- Internal Spinal Cord Structures: Gray Matter -- Internal Spinal Cord Structure: White Matter -- The Brainstem: An Overview -- The Medulla -- Medulla: External Features -- Medulla: Internal Features -- The Pons -- Pons: External Features -- Pons: Internal Features -- The Mesencephalon -- Mesencephalon: External Features -- Mesencephalon: Internal Features -- The Top Ten List -- Chapter 4 Abbreviations -- Study Questions and Activities -- References -- Chapter 5. Neuroanatomy of the Human Nervous System: Cranial Nerve Systems -- Introduction and Learning Objectives -- Organization of the Cranial Nerves and Nuclei in the Brainstem -- Functional Classifications

System of the Brain -- Neurovascular Complex Is Divided Into Arterial and Venous Systems -- Anterior Arterial System -- Posterior Arterial System -- Venous System Sinuses Drain Deoxygenated Blood Back to the Heart -- Vascular Pathology Can Arise From Three General Situations -- Aneurysms and Hemorrhagic Stroke -- Ischemic Events -- Arteriovenous Malformations -- The Top Ten List -- Chapter 7 Abbreviations -- Study Questions and Activities -- References -- Section 2. Sensory Systems.
Chapter 8. Basic Principles of Sensation and Perception.

Sommario/riassunto

Neuroscience Fundamentals for Communication Sciences and Disorders, Second Edition is a comprehensive textbook primarily designed for undergraduate neural bases or graduate neuroscience courses in communication sciences and disorders programs (CSD). The text can also be used as an accessible go-to reference for speech-language pathology and audiology clinical professionals practicing in medical and rehab settings. Written with an engaging and conversational style, the author uses humor and analogies to explain concepts that are often challenging for students. Complemented by more than 400 visually rich and beautifully drawn full-color illustrations, the book emphasizes brain and behavior relationships while also ensuring coverage of essential neuroanatomy and neurophysiology in an integrative fashion. With a comprehensive background in the principles, processes, and structures underlying the workings of the human nervous system, students and practitioners alike will be able to better understand and apply brain-behavior relationships to make appropriate clinical assessments and treatment decisions.