BASIC NEUROCHEMISTRY: PRINCIPLES OF MOLECULAR, CELLULAR AND MEDICAL NEUROBIOLOGY

9th Edition

Editors-in-Chief: Scott Brady and Monica Carson

Fully updated and expanded. Publication expected early 2023

I. FUNDAMENTALS OF CELLULAR NEUROCHEMISTRY

1. Cell Biology of the Nervous System

2. Cell Membrane Structure and Functions

3. Electrical Excitability and Ion Channels

4. Lipids

5. The Cytoskeleton of Neurons and Glia

6. Intracellular Trafficking

7. Axonal Transport

8. Energy Metabolism of the Brain

9. Cell Adhesion Molecules

10. Myelin Structure and Biochemistry: myelinating glia

11. Astrocytes

12. Microglia

13. Cellular and Molecular Mechanisms of Homeostasis

II. INTERCELLULAR SIGNALING

14. Synaptic Transmission and Cellular Signaling: An Overview (exocose box)

15. Acetylcholine

16. Catecholamines

17. Serotonin

18. Histamine

19. Glutamate and Glutamate Receptors

20. GABA and Glycine

21. Purinergic Signaling

22. Neuropeptides

III. INTRACELLULAR SIGNALING

23. G Proteins

24. Cyclic Nucleotides in the Nervous System

25. Phosphoinositides

26. Calcium

27. Serine and Threonine Phosphorylation

28. Tyrosine Phosphorylation

29. Transcription Factors in the Central Nervous System and Epigenetics

30. Lipid Mediators: Eicosanoids, Docosanoids and Platelet-Activating Factor

31. RNA-based signaling

IV. GROWTH, DEVELOPMENT AND DIFFERENTIATION

32. Development of the Nervous System

33. Growth Factors

34. Stem Cells in the Nervous System

35. Formation and Maintenance of Myelin

36. Axonal Growth, Regeneration and Compensatory Plasticity

V. INJURY AND INFLAMMATION

37. Immune and Nervous System Interactions

38. Brain Ischemia and Reperfusion: Cellular and Molecular Mechanisms in Stroke Injury

39. Neurotrauma and CTE

40. Gut-brain/Microbiome plus enteric nervous/metabolic stress in neuroimmune interactions

41. Brain Tumors

VI. NEURODEGENERATIVE AND NEUROLOGICAL DISEASES

42. Peripheral Neuropathy: Neurochemical and Molecular Mechanisms

43. Disorders of Muscle Excitability

44. Diseases Involving Myelin

45. Mitochondria and Peroxisome Disorders

46. Lysosomal and Metabolic Disorders

47. Motor Neuron Diseases

48. Alzheimer's Disease

49. Synucleinopathies and Tauopathies

50. Neurotransmitters and Disorders of the Basal Ganglia

51. CAG-Polyglutamine Repeat Diseases

52. Molecular Basis of Prion Diseases

VII. MOLECULAR BASIS OF SENSORY TRANSDUCTION

53. Vision

54. Olfaction and Taste

55. Hearing and Balance

56. Pain

VIII. NEURAL PROCESSING AND BEHAVIOR

57. Endocrine Effects on the Brain

58. Learning and Memory

59. Sleep and Wakefulness

60. The Epilepsies: Phenotypes and Mechanisms

61. Schizophrenia

62. Autism Spectrum Disorders

63. Severe Mood and Anxiety Disorders

64. Addiction