

1. Record Nr.	UNINA9910792253003321
Autore	Robinson Joseph D
Titolo	Mechanisms of synaptic transmission [[electronic resource]] : bridging the gaps (1890-1990) / / Joseph D. Robinson
Pubbl/distr/stampa	Oxford ; ; New York, : Oxford University Press, 2001
ISBN	0-19-803145-9 9786610834624 1-280-83462-5
Descrizione fisica	1 online resource (468 p.)
Disciplina	573.809 573.85 612.8
Soggetti	Neural transmission - Research - History - 20th century Synapses - Research - History - 20th century
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 359-442) and index.
Nota di contenuto	Contents; 1. Beginnings: Cajal and the Neuron Theory (1889-1909); Cajal at Berlin; Background: Cells, Nerve Cells, and Nerve Impulses; Proclamation of the Neuron Theory; Cajal's Contributions; Confirmations, Criticisms, and Responses; Conclusions; 2. Beginnings: Sherrington and the Synapse (1890-1913); Sherrington, Reflexes, and the Synapse; Background: Reflexes; Sherrington's Achievements; Synapses and the Reflex Arc; Conclusions; 3. Chemical Transmission at Synapses (1895-1945); Nerve Impulse Conduction and Synapse Structure; Background: The Autonomic Nervous System Chemical Transmission in the Autonomic Nervous System Chemical Transmission at Neuromuscular Junctions; Chemical Transmission in the Central Nervous System; Electrical Transmission; Conclusions; 4. Chemical Transmission at Synapses (1945-1965); Postwar Progress; Identifying Chemical Transmission; Visualizing Synaptic Gaps and Synaptic Vesicles; Identifying Electrical Transmission; Conclusions; 5. Identifying Neurotransmitters (1946-1976); Scope and Criteria; Acetylcholine; Noradrenaline; Dopamine; Serotonin; GABA; Glutamate; Glycine; Neuropeptides: Substance P and Enkephalins; Conclusions

6. Characterizing Receptors (1905-1983) Essential Issues; Drug-Receptor Interactions; Receptor Classification; Structure-Activity Relationships; Receptor Identification and Purification; Responses of Individual Receptor Molecules; Conclusions; 7. Second Messengers (1951-1990); Cyclic AMP; Protein Kinases and Phosphatases; G-Proteins; Ca^{2+} ; Inositol-trisphosphate and Diacylglycerol; Conclusions; 8. Receptor Structures and Receptor Families (1983-1990); Molecular Biology and Recombinant DNA Techniques; Nicotinic Cholinergic Receptors; Ligand-Gated Ion Channels; Adrenergic Receptors; G-Protein Coupled Receptors; Receptor Regulation; Conclusions; 9. Synthesis, Storage, Transport, and Metabolic Degradation of Neurotransmitters; Steps in Chemical Transmission; Synthesis; Storage; Degradation; Transport ("Reuptake"); Conclusions; 10. Neurotransmitter Release; Proposals; Evidence for Exocytotic Release; Triggering of Release; Mechanism of Release; Endocytotic Retrieval of Vesicles; Ca^{2+} -Independent Non-Exocytotic Release; Conclusions; 11. Formation of Specific Synapses; Embryonic Development of Synaptic Connections; Approaches and Possible Mechanisms; Early Arguments Concerning Chemotaxis (1890-1963); Cell Death and Neurotrophic Factors; Chemical Guidance (1963-1990); Growth Cone Motility; Synapse Formation; Conclusions; 12. Learning; Background; Chemical Representations; Learning in Aplysia; Learning in Drosophila; Learning in Mammals: The Hippocampus and Long-Term Potentiation (LTP); Conclusions; 13. Diseases and Therapies; Defining and Developing; Parkinson's Disease; Schizophrenia; Depression and Manic-Depressive Illness; Conclusions; 14. Epilogue; Progress; Historical Accounts and Conclusions; Assumptions; Approaches; Goals; Generalities and Exceptions

Sommario/riassunto

This book describes a century of research on how nerve cells communicate with one another, beginning with the formulation of the Neuron Theory and proceeding through studies embracing a broad range of disciplines. The Neuron Theory initially depicted discrete nerve cells interacting at their points of contact ("synapses"); since nerve impulses were often identified as electrical signals traveling along neuronal processes, it seemed plausible that impulses would also pass from cell to electrically. Over the next hundred years, however, ingenious experiments, facilitated by powerful new techni