

1. Record Nr.	UNINA9910624309903321
Titolo	Voltage-Gated Calcium Channels // edited by Gerald Werner Zamponi, Norbert Weiss
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2022
ISBN	3-031-08881-6
Edizione	[1st ed. 2022.]
Descrizione fisica	1 online resource (705 pages)
Collana	Physics and Astronomy Series
Disciplina	572.516 572.3
Soggetti	Cytology Neurosciences Human physiology Biophysics Pharmacology Cell Biology Neuroscience Human Physiology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1. Measuring and manipulating calcium -- 2. Structure, function and subunit assembly of VGCC -- 3. Splice variation and RNA editing of VGCCs -- 4. Mechanisms of calcium channel permeation -- 5. Regulation by beta subunits -- 6. Regulation by alpha2 delta subunits -- 7. VGCCs in invertebrates -- 8. Modulation by GPCRs and second messengers -- 9. Trafficking of VGCCs -- 10. Calcium regulation -- 11. Calcium channel complexes with other channels -- 12. Regulation of gene transcription by VGCCs -- 13. Lessons from knock-out and knock-in mice -- 14. VGCCs and synaptic transmission -- 15. Cardiovascular syste -- 16. Calcium channels and exocytosis in chromaffin cells -- 17. Calcium channels in the pancreas in health and disease -- 18. Skeletal muscle system -- 19. Auditory and visual systems -- 20. Calcium channels and pain transmission -- 21. Migraine -- 22. Epilepsy -- 23. Psychiatric disorders -- 24. Parkinson's

disease.-25. Reproductive system -- 26. Cancer -- 27. Molecular determinants of VGCC pharmacology -- 28. Interactions with peptide toxins -- 29. Clinical pharmacology and drug discovery.

Sommario/riassunto

This book covers the tremendous progress in the current understanding of the molecular physiology of voltage-gated calcium channels. This book includes unparalleled insights into structural features of calcium channels due to X-ray crystallography and cryo-EM, which in turn yielded critical information into how these channels function under normal and pathophysiological conditions, and how they interact with calcium channel therapeutics. The chapters investigate how, with the advent of high throughput genome sequencing, numerous mutations in various calcium channel genes have been identified in patients with neurological, cardiovascular, neuropsychiatric and other disorders. This is further complemented through a much larger in vivo toolkit such as knock-out and knock-in mice. The chapters further discuss the increased complexity of calcium channel physiology that arises from mRNA editing and splicing. Finally, the book also provides an overview of the updated research on calcium channel inhibitors that can be used both in vivo and in vitro, and which may serve as a spring board for new calcium channel therapeutics for human disease. Voltage-Gated Calcium Channels is useful for academic researchers at all levels in neuroscience, biophysics, cell biology and drug discovery. Provides a comprehensive update on the state of knowledge of voltage-gated calcium channels; Examines how calcium channels are pharmacologic targets in the treatment of epilepsy, hypertension, and pain; Explores the new, sophisticated imaging approaches that have increased our ability to measure calcium in live cells; Presents an understanding of the molecular mechanisms that govern calcium channel trafficking and distribution.
