1.	Record Nr.	UNINA9910337946203321
	Titolo	In Vitro Neuronal Networks : From Culturing Methods to Neuro-Technological Applications / / edited by Michela Chiappalone, Valentina Pasquale, Monica Frega
	Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019
	ISBN	3-030-11135-0
	Edizione	[1st ed. 2019.]
	Descrizione fisica	1 online resource (387 pages)
	Collana	Advances in Neurobiology, , 2190-5215 ; ; 22
	Disciplina	612.82 573.85
	Soggetti	Neurochemistry Biomedical engineering Biomedical Engineering/Biotechnology
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Nota di contenuto	1. Past, present and future of neuronal models in vitro -- 2. In vitro models of neural disorders -- 3. Neuronal cultures and nanomaterials -- 4. Advances in Human Stem Cell Derived Neuronal Cell Culturing and Analysis -- 5. Large scale, high-resolution microelectrode arrays for interrogation of neurons and networks -- 6. Multi-site intracellular recordings -- 7. From MEAs to MOAs: the next generation of bioelectronic interfaces for neuronal cultures -- 8. Scaling spike detection and sorting for next generation electrophysiology -- 9. Burst detection methods -- 10. Reconstruction of functional connectivity from multi-electrode recordings and calcium imaging -- 11. Open-source tools for processing and analysis of in vitro extracellular neuronal signals -- 12. Screening chemicals for potential neurotoxicity and developmental neurotoxicity using neural networks grown on MEAs -- 13. Long-term activity dynamics of single neurons and networks -- 14. Electrical and optical closed-loop systems.
	Sommario/riassunto	This book provides a comprehensive overview of the incredible advances achieved in the study of in vitro neuronal networks for use in basic and applied research. These cultures of dissociated neurons offer a perfect trade-off between complex experimental models and

theoretical modeling approaches giving new opportunities for experimental design but also providing new challenges in data management and interpretation. Topics include culturing methodologies, neuroengineering techniques, stem cell derived neuronal networks, techniques for measuring network activity, and recent improvements in large-scale data analysis. The book ends with a series of case studies examining potential applications of these technologies.