

1. Record Nr.	UNINA9910917791403321
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Titolo	Advances in Metabolomics // edited by Vijai Singh
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2024
ISBN	9789819774593 9819774594
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (397 pages)
Disciplina	570.28
Soggetti	Biology - Technique Biology Molecular probes Artificial intelligence Molecules - Models Biological Techniques Biological Sciences Biological Sensors and Probes Artificial Intelligence Molecular Modelling
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	1. Current approaches on metabolomics -- 2. Applications of computational and data sciences in metabolomics -- 3. Design of biosynthetic pathway for production of metabolites -- 4. Dissecting Cellular Heterogeneity: Single-Cell Metabolomics for Unmasking Hidden Variations -- 5. Biosensors for Detection of Metabolites -- 6. Unveiling the Molecular Fingerprint: Mass Spectrometry in Metabolomics -- 7. Utilizing HPLC for Efficient Metabolite Purification -- 8. NMR Spectroscopy for Characterisation of Metabolite -- 9. Transcriptional control for metabolite production -- 10. Microfluids in metabolites detection, production, and optimization -- 11. Cell free systems in metabolomics -- 12. Unlocking the Metabolome: A Guide to Genome Editing for Precision Control of Cellular Chemistry -- 13. Production and Fermentation Optimization of Flavour and Fragrance

Sommario/riassunto

The book delves into metabolomics which is a rapidly growing field that focuses on the study of chemical processes involving metabolites. These metabolites are small molecules that serve as substrates, intermediates, and end products of cellular metabolism. The book covers a wide range of tools and methods to facilitate metabolomics analysis, including modelling, gas chromatography, GC-MS, HPLC, MALDI, nuclear magnetic resonance, and many others. The book introduces metabolomics and then delves into tools and methods used in metabolomics research, followed by genome-scale analysis and fluxomics, which explore the complex metabolic networks within cells. The design of biosynthetic pathways is discussed in detail, highlighting their significance in manipulating cellular metabolism. The book also explores biosensors, chromatography techniques, NMR spectroscopy, transcriptional control of metabolite production, microfluidics, and the role of artificial intelligence and machine learning in metabolomics research. Additionally, it delves into cell-free systems, bioprocess optimization, fermentation technology, and industrial-scale production of metabolites. This book fills a significant gap in the market with comprehensive coverage and inclusion of diverse topics making it a valuable resource for students, researchers, scientists, clinicians, policymakers, and practitioners in the field.