



Natural Biomarkers for Cellular Metabolism : Biology, Techniques, and Applications

Edited by Vladimir V. Ghukasyan, Edited by Ahmed A. Heikal



From the Lab to Clinical Settings-Advances in Quantitative, Noninvasive Optical Diagnostics Noninvasive fluorescence imaging techniques, novel fluorescent labels, and natural biomarkers are revolutionizing our knowledge of cellular processes, signaling and metabolic pathways, the underlying mechanisms for health problems, and the identification of new therapeutic targets for drug discoveries. Natural Biomarkers for Cellular Metabolism: Biology, Techniques, and Applications delves into the current state of knowledge on intrinsic fluorescent biomarkers and highlights recent developments in using these biomarkers for the metabolic mapping and clinical diagnosis of healthy and diseased cells and tissues. Autofluorescent Biomarkers for Biomedical Diagnostics The books first section introduces the fundamentals of cellular energy metabolism as well as natural biomarkers within the context of their biological functions. The second section outlines the theoretical and technical background of quantitative, noninvasive, autofluorescence microscopy and spectroscopy methods, including experimental design, calibration, pitfalls, and remedies of data acquisition and analysis. The last two sections highlight advances in biomedical and biochemical applications, such as monitoring stem cell differentiation in engineered tissues and diagnosing cancer and ophthalmic diseases quantitatively and noninvasively. Tailored to Interdisciplinary Researchers Covering cell biology, imaging techniques, and clinical diagnostics, this book provides readers with a complete guide to studying cellular/tissue metabolism under healthy, diseased, and environment-induced stress conditions using natural biomarkers. The book is designed for graduate and advanced undergraduate students, biophysics instructors, medical researchers, and those in pharmaceutical R&D.

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