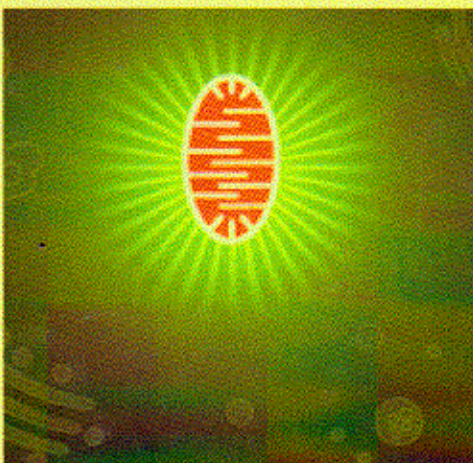


Natural Biomarkers for Cellular Metabolism: Biology, Techniques, and Applications

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.



The book's 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.

FEATURES

- Provides the biological background associated with energy metabolism and other metabolic pathways as well as the spectroscopy of potential biomarkers intrinsic in living cells and tissues
- Explores recent advances in natural biomarkers, including quantitative, noninvasive optical methods for cellular/tissue metabolism studies
- Covers the theoretical and technical aspects of various fluorescence microscopy and spectroscopy methods used to monitor the autofluorescence of natural biomarkers in living cells/tissues
- Explains how to use cellular autofluorescence to investigate metabolic activities, mitochondrial anomalies, and biochemical redox reactions in healthy cells/tissues under different external manipulations induced by drugs, diseases, or environmental hazards
- Describes the latest laser-based medical diagnostic approaches that address the cellular and biochemical mechanisms of health problems in both quantitative and noninvasive ways

Covering cell biology, imaging techniques, and clinical diagnostics, this book provides you with a complete guide to studying cellular/tissue metabolism under healthy and diseased conditions using natural biomarkers.

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