Cell-wide Metabolic Alterations Associated with Malignancy, Vol 543.
Methods in Enzymology

Description: This new volume of Methods in Enzymology continues the legacy of this premier serial with quality chapters authored by leaders in the field. This volume covers research methods providing a theoretical overview on metabolic alterations of cancer cells and a series of protocols that can be employed to study oncometabolism, in vitro, ex vivo and in vivo. Malignant cells exhibit metabolic changes when compared to their normal counterparts, owing to both genetic and epigenetic alterations. Although such a metabolic rewiring has recently been indicated as "yet another" general hallmark of cancer, accumulating evidence suggests that the metabolic alterations of each neoplasm rather represent a molecular signature that intimately accompanies, and hence cannot be severed from, all facets of malignant transformation.

Contents:
1. Methods to measure cytoplasmic and mitochondrial Ca2+ concentration using Ca2+-sensitive dyes
2. Methods to measure intracellular Ca2+ fluxes with Organelle-Targeted aequorin-based probes
3. Methods to measure baseline Ca2+ levels with second-generation organelle-targeted fluorescent probes
4. Methods to assess the autophagic flux in malignant cells
5. Methods to assess autophagy in situ—transmission electron microscopy versus immunohistochemistry
6. Methods to measure the enzymatic activity of PI3Ks
7. Luciferase-based reporter to monitor the transcriptional activity of the SIRT3 promoter
8. Metabolomic profiling of cultured cancer cells
9. Pulsed stable isotope-resolved metabolomic studies of cancer cells
10. Single-cell imaging for the study of oncometabolism
11. Study of cellular oncometabolism via multi-dimensional protein identification technology
12. In vivo quantitative proteomics for the study of oncometabolism
13. Metabolomic profiling of neoplastic lesions in mice
14. Metabolomic profiling of tumor-bearing mice
15. Metabolomic studies of patient material by high-resolution magic angle spinning nuclear magnetic resonance (HR-MAS NMR) spectroscopy
16. Analysis of metabolomic profiling data acquired on GC-MS

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