THE CANCER-METABOLISM LINK

XF Gold Standard assays measure the hallmarks of cancer: oncogene reprogramming of metabolism, substrate preference of tumor cells, and metabolic phenotypes.

Proliferation, associated with carcinogenesis, involves oncogenes, proto-oncogenes, and mutated tumor-suppressor genes. Rapid proliferation correlates to the cells' metabolic phenotype. To maintain rapid growth cancer cells will reprogram their metabolic phenotype, switching between glycolytic and aerobic phenotypes.

Cancer cells change their substrate preference as they alter their metabolic phenotypes. For example, cancer cells may increase glutamine metabolism, alter lipid metabolism, or shift the balance between anabolic and catabolic processes.

There is increasing evidence of the interactions amongst genes, substrates, and phenotypes. XF Technology and the Gold Standard assays bring unique value to investigate the mechanisms behind the hallmarks of cancer and altered cell metabolism.

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Cancer cells exhibit a phenotype that reflects their metabolic needs. Researchers are using XF Technology and XF Stress Tests to explore these metabolic changes, and the effect of metabolic therapies to increase their understanding of cancer. The XF Cell Mito Stress Test measures the key parameters of respiration: basal respiration, proton leak, ATP-linked respiration, maximal respiration, and spare respiratory capacity. The XF Glycolysis Stress Test measures the key parameters of glycolytic function: glycolysis, glycolytic basal respiration, proton leak, ATP-linked respiration, maximal respiration, and spare respiratory capacity.

**Pathways and Mechanism of Action in Cancer Cells**

Cancer therapies have exploited rapid proliferation as a treatment option. These treatment options can result in unwanted and unacceptable side effects. Using XF Technology to focus on understanding cell metabolism, more selective therapeutic agents can be studied and explored, not only for the effect on cancer cells, but for their systemic effects as well.

**Substrate Preference**

Cancer cells alter their substrate preference to maintain their rapid proliferation. XF Technology provides the necessary tools that facilitate the exploration of substrate preferences, enabling a greater understanding of cancer cell progression.