Influence of the tumor environment on cancer cell metabolism
Matthew G. Vander Heiden
Koch Institute for Integrative Cancer Research at Massachusetts Institute of Technology,
Cambridge, MA, USA
mvh@mit.edu

Cells adapt metabolism to meet distinct physiological needs, and metabolic regulation influences tumor initiation and progression. To proliferate, cancer cells must adapt metabolism to support anabolic processes that allow the accumulation of biomass. How cells use metabolism to support cell proliferation is influenced by both metabolic gene expression and available nutrients. We find that cancer cell metabolism is constrained by conditions found in tumor tissue, where synthesis of some macromolecules, including nucleotides can be limiting for proliferation. Targeting these limiting metabolic requirements is one approach to treat cancer. Changes in metabolism can also lead to the accumulation of toxic metabolites, and the ability of tumors to adapt to these changes may represent yet another vulnerability of cancers. Finally, manipulating whole body animal metabolism can affect cancer outcomes and influence tumor progression and consideration of how whole body metabolism influences cancer cell metabolism will also be discussed.