Impact of Environmental Factors on Human Cellular Metabolism

Cells in culture are commonly used to study metabolism and to develop drug candidates that exploit metabolic vulnerabilities. However, while it is increasingly appreciated that environmental factors influence cellular metabolism, conventional culture methods inadequately represent key physiologic conditions and limit efforts to interrogate distinct aspects of the environment in isolation. Nonetheless, given the scope and flexibility of experimentation possible in cultured cells, in vitro models remain essential tools for examining cell metabolism.

We recently developed a new culture medium to reflect the polar metabolite composition of human plasma (human plasma-like medium; HPLM) and demonstrated that, relative to conventional media, it extensively alters the metabolic landscape of cultured cells. Through the use of HPLM, we also discovered an unforeseen example of metabolic regulation that would have been difficult to identify otherwise using existing model systems, and moreover, that influences the potency of a common chemotherapeutic. Together with additional tools and methods we have developed, as well as with various strategies in functional genomics and metabolomics among others, I will describe my ongoing efforts to better understand how environmental factors that more faithfully reflect physiologic conditions influence the metabolism of cancer and immune cells. Such approaches will be directed toward addressing fundamental questions in cell metabolism and may be exploited to uncover new targets and approaches in cancer therapy.

Tuesday, Sept. 11, 2018
Lecture at 4:00 p.m.
Room 1610, Engineering Hall
Refreshments will be served at 3:45 p.m.