Perelman School of Medicine
University of Pennsylvania

NIDDK P30 Center for Molecular Studies in Digestive and Liver Diseases

Research Seminar

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"Slow energy metabolism in primary solid tumors"

Thursday, January 11, 2024
12:00 – 1:00 PM EST
901 Biomedical Research Building
Lunch is provided, all are invited.
901 Biomedical Research Building or https://pennmedicine.zoom.us/j/98939770145

This talk will address tumors display altered metabolism compared to healthy tissues, but it is not known whether tumors make and use energy faster than healthy tissues. Both glycolysis and the tricarboxylic acid (TCA) cycle with the electron transport chain produce ATP, so we developed methods to measure both pathways in mouse tissues and tumors in vivo. We observed slower TCA cycle flux in primary solid tumors, including two models of pancreatic cancer, compared to healthy tissues, while metastatic lesions displayed faster TCA cycle flux than the primary tumor they derived from. Although primary solid tumors displayed more glycolysis than healthy tissues, consistent with the Warburg effect, they made ATP more slowly due to their decreased TCA cycle flux. In murine pancreatic cancer, this lower energy production was accommodated by downregulation of protein synthesis, one of this tissue's major energy costs. We found that primary solid tumors have slower ATP production than most healthy tissues, suggesting that tumors must use 'thrifty' metabolism to proliferate on a limited energy supply.

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