Lessons Learned studying Metabolism in Aging, Cancer, and Immunity

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The population is aging at an unprecedented rate. As the number of elderly adults grows, it is critical to understand the molecular underpinnings of aging biology. Yet, we still do not fully appreciate the mechanistic basis of why age increases the risk of major diseases, including cancer. Metabolic rewiring is a hallmark of cancer and supports the increased biosynthetic and energetic requirements of cancer cells. Tumor metabolism may be regulated by tumor cell intrinsic mechanisms. In addition, the tumor microenvironment provides a unique niche that supports the metabolic reprogramming of the tumor but may be suppressive to cytotoxic T cells. Here, we will discuss the how age impacts the unique metabolic states of tumor and immune cells within the tumor microenvironment. Finally, we will discuss the regulation of age-specific immune cell changes by mitochondrial and metabolic control.