Immunosuppression by the tumor nutrient microenvironment

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Tumor cells require nutrients and oxygen at amounts that exceed their supply. This leads to the secretion of pro-angiogenic molecules in order to restore balance. Additionally, nutrient avidity of tumor cells leads to an immunosuppressed environment thought to be due to nutrient competition between tumor and immune cells. We subjected a variety of tumor cell lines to nutrient restriction and studied their secretome in order to explore the tissue responses that this would promote. Cytokine arrays unveiled that starved tumor cells secrete molecules that modulate immune functions. Acute starvation triggered the secretion of the neutrophil chemoattractant IL-8 and the inflammatory mediator IL-6, both of which participate in tumor growth and correlate with poor prognosis. I will present these and other results that indicate that the hypoglycemic conditions of the nutrient microenvironment promote paracrine responses in cells of the immune system and endothelial cells, which together can lead to persistent inflammation, angiogenesis and cancer immunosuppression.

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