HYPERGLYCEMIA AFFECTS THE GLYCOPHENOTYPE AND INCREASES TUMOR PROGRESSION AND METASTASIS OF MURINE COLON CARCINOMA CELL MC38

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Cancer cells depend on altered metabolism and nutrient uptake to generate and keep the malignant phenotype. Recent work suggests that the metabolite availability to the hexosamine pathway exerts control over cell signaling, gene expression and cell migration (Plos One, 8: e60471, 2013). These results put forward the hypotheses that glycosylation acts a metabolic sensor and, in turn, modulates cell plasticity (cell survival and proliferation). Our main purpose was to study the role of cellular glycosylation in tumor progression, in this work we analyzed the impact of hyperglycemia (HG) in glycophenotype and tumor progression of murine colon carcinoma cells (MC38) \textit{in vivo}. HG was induced by selective destruction of β pancreatic cells through treatment of C57BL/6 with streptozotocin (STZ). HG mice showed subcutaneous tumors with increased area and mass. Magnetic resonance imaging showed early development of tumors in STZ treated mice when compared with control animals. Histochemistry of subcutaneous tumors demonstrated an increment of glycoconjugates containing α2-6Neu5Ac and α1-3- or 1-6fucose residues. Noteworthy is that STZ treated mice showed a higher number of nodules in the lung when the MC38 cells were injected intravenously. Taken together, our results allow us to infer that an increase of glucose levels induces the biosynthesis of aberrant glycoconjugates, and increases tumor progression and metastasis of murine colon carcinoma cell MC38.

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