

Hypoxic signature and cancer stem cell marker expression as tumor biology predictors

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Oncogenesis needs to be considered in its micro-environmental context; the micro-environment of cancerous and precancerous cells can enhance cell growth and contribute to metastasis. Moreover, the heterotypic interaction between cancer cells and cancer stroma is a crucial and, most importantly, a druggable feature of tumors. Hypoxia has emerged as a major tumor microenvironment feature linked with a more aggressive phenotype. Solid human cancers frequently express several hypoxic markers during their invasive growth phase, being HIF factors activation an early event during carcinogenesis. Tumor carbonic anhydrase IX (CA IX) is a transcriptional target of HIF; CA IX protein expression is strictly hypoxia regulated, and is considered as a marker of tumor hypoxia, frequently linked to high degree of tumor aggressiveness and resistance to therapy. In order to analyze the relationship between CA IX expression and the biological behavior of several malignant human tumors that differ for histogenesis and outcome, in our study we assessed the expression level of CA IX in selected series of tumors. The study was performed by immunohistochemistry on formalin-fixed, paraffin-embedded tissues.

The statistical evaluation of our results let us hypothesize that the tissue overexpression of CA IX could be a promising marker of biological aggressiveness of solid human malignant tumors, especially when we analyzed it in combination with the expression of cancer stem cells markers.

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