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The pivotal role of H19 in human tumorigenesis - Novel approach in cancer therapy

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H19 long non-coding RNA (lnc RNA) is emerging as one of the key players in cancer biology. Although H19 lnc RNA was long ago reported to be overexpressed in the majority types of human cancers, but not in normal adjacent tissues, clear, causal evidence of its role in cancer has only recently come to light. We have shown that cancer cells devoid of H19 expression encounter a very significant retardation of tumor growth *in vivo*. In addition we have proven that H19 RNA contributes significantly to several aspects of the malignant phenotype, including proliferation under serum starvation, hypoxic stress response, angiogenesis, multi-drug resistance and recently also to epithelial to mesenchymal transition (EMT). Given the wide range of cancer-associated phenotypes in which H19 is involved, we believed and proven that H19 is an ideal basis for highly selective cancer therapy. Using the H19 regulatory elements to drive the expression of Diphtheria toxin, we have created a cancer-targeted DNA-based killing drug that leaves the healthy surrounding tissues unharmed. Our talk will review our findings regarding H19 mechanism of action, the creation of H19 based drugs and our promising results in bladder, pancreas and ovarian cancer clinical trials.

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