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Titel des Beitrags: 
Image-guided tumor-selective radiiodine therapy of liver cancer after systemic nonviral delivery of the sodium iodide symporter gene.

Abstract: 
We reported the induction of tumor-selective iodide uptake and therapeutic efficacy of (131)I in a hepatocellular carcinoma (HCC) xenograft mouse model, using novel polyplexes based on linear polyethylenimine (LPEI), shielded by polyethylene glycol (PEG), and coupled with the epidermal growth factor receptor-specific peptide GE11 (LPEI-PEG-GE11). The aim of the current study in the same HCC model was to evaluate the potential of biodegradable nanoparticle vectors based on pseudodendritic oligoamines (G2-HD-OEI) for systemic sodium iodide symporter (NIS) gene delivery and to compare efficiency and tumor specificity with LPEI-PEG-GE11. Transfection of HCC cells with NIS cDNA, using G2-HD-OEI, resulted in a 44-fold increase in iodide uptake in vitro as compared with a 22-fold increase using LPEI-PEG-GE11. After intravenous application of G2-HD-OEI/NIS HCC tumors accumulated 6-11% ID/g (123)I (percentage of the injected dose per gram tumor tissue) with an effective half-life of 10 hr (tumor-absorbed dose, 281 mGy/MBq) as measured by (123)I scintigraphic gamma camera or single-photon emission computed tomography computed tomography (SPECT CT) imaging, as compared with 6.5-9% ID/g with an effective
half-life of only 6 hr (tumor-absorbed dose, 47 mGy/MBq) for LPEI-PEG-GE11. After only two cycles
of G2-HD-OEI/NIS/(131)I application, a significant delay in tumor growth was observed with markedly
improved survival. A similar degree of therapeutic efficacy had been observed after four cycles of
LPEI-PEG-GE11/(131)I. These results clearly demonstrate that biodegradable nanoparticles based
on OEI-grafted oligoamines show increased efficiency for systemic NIS gene transfer in an HCC
model with similar tumor selectivity as compared with LPEI-PEG-GE11, and therefore represent a
promising strategy for NIS-mediated radiiodine therapy of HCC.