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Tumor stem cells – P45

Nanoparticel labelling of stem cell populations in head and neck cancer
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Head and neck squamous cell carcinoma (HNSCC) is one of the most common solid neoplasms worldwide. Unfortunately, the mortality rates are still high due to local tumor invasion and to a high predilection for the development of relapses and metastases. The cellular and molecular mechanisms responsible for tumor aggressiveness and its response to chemo- and radiation therapies remain mostly unknown. It is becoming more and more obvious that tumor progression and metastasis are stem cell driven processes and that these ‘tumor stem cells’ have to be in the focus of innovative therapeutic and diagnostic approaches.

Our aim is to identify and characterize tumor stem cell populations in HNSCC and to analyze and visualize their migration activity and their tumor inducing potential. Therefore, cells were labelled with superparamagnetic dextran coated iron oxide nanoparticles in order to make them detectable via ‘magnetic particle imaging’ (MPI), which is a new quantitative imaging technique capable of determining the spatial distribution of superparamagnetic nanoparticles at high temporal and spatial resolution. Tumor cells’ nanoparticel uptake was corroborated using flow cytometry analysis of FITC labelled particles as well as electron microscopy. We will show the progress of our investigations.