

Poster presentation

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Developing fluorescent, tumour-specific "smart probes": Transketolase-like I (TKTL1) expression und function in primary carcinomas of the head and neck

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Introduction

The development of tumour-specific, fluorescent smart probes has the potential to improve the early diagnosis of cancer and metastatic spread. TKTL1 thereby seems an interesting enzyme to target, as it has been described to be overexpressed in a number of malignancies. It plays a central role in the pentose phosphate pathway, and its overexpression might lead to a selection advantage in tumour cells as their metabolism might become widely independent of the presence of oxygen. Therefore, they can survive under the common hypoxic conditions within tumours, while at the same time lactate and CO₂ production increase, which in turn promotes matrix degradation and favours metastasis formation.

Methods

The aim of this preliminary project is the analysis of TKTL1 expression in upper aerodigestive tract epithelial cells of different sites. Prior to this it seemed mandatory to verify the specificity of the commercially available TKTL1 antibody. Therefore, we analysed stable transfectants of HEK 293 cells via immunoblot and siRNA transfection. Furthermore, TKTL1 mRNA levels in carcinoma cell lines were determined via RT-PCR.

Results

The main protein band of TKTL1 at 65 kD was detected, however along with two additional protein bands, which

occurred in control cells, too. Downregulation of TKTL1 via specific siRNA showed an effect on the main protein band, while the additional protein bands remained unaffected. These results suggest an unspecific binding of the antibody in addition to the specific TKTL1 detection.

Conclusion

Some future experiments with stable transfectants and siRNA should show if TKTL1 expression mediates a proliferation advantage in head and neck carcinomas.