Profiling of the TLR mediated mTOR signaling cascades in HNSCC

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Objectives: The signaling cascades of the innate immune system are often triggered by Toll-like receptors (TLR), whereas mTOR (mammalian target of Rapamycin) is a key regulator for cell proliferation, growth and mortality. This work shows our recent investigations concerning the impact of TLR’s on mTOR mediated signaling cascades in squamous cell carcinoma of the head and neck (SCCHN).

Methods: Cytokine profiles were measured using Cytometric Bead Arrays. mTOR activation and other protein levels as well as proliferation analysis were determined using SDS-Page/Western-Blot, Flow Cytometry and MTT assays. Different permanent HNSCC cell lines, primary tissue of healthy mucosa and solid HNSCC were analyzed.

Results: Our data indicate mTOR as an important key regulator in HNSCC with respect to biosynthesis of the tumor microenvironment. Furthermore we demonstrate the influence of Rapamycin and TLR ligands on growth in permanent HNSCC cell lines in a dose depend manner.

Conclusion: In summary, our data demonstrate a clear correlation between TLR activation and the requirement of mTOR signaling regarding the cytokine secretion patterns and the following TLR-mTOR signaling cascades. In addition, we can display a difference between solid HNSCC, the corresponding metastasis and permanent cell lines with respect to cytokine secretion and mTOR activation.