**INVESTIGATION OF CELL METABOLISM FOR TUMOR DIAGNOSIS BY MULTISPECTRAL FLIM**

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During fluorescence guided diagnosis of tumor tissue false positive results are interfering with the outcome. Discrimination between tumor and inflammation could be therefore difficult. Improvement of fluorescence diagnosis through observation of cell metabolic processes could be the solution, which needs detailed imaging investigations of the autofluorescence. A complex combination of fluorophores give rise to the emission signal. The combination of FLIM and spectral-resolved techniques are demonstrated to improve specificity.

A common property during tumor development is altered glucose metabolism, which could lead to a switch between OXPHOS (oxidative phosphorylation) and glycolysis and a change in the redox ratio. This could be correlated with a change in the fluorescence lifetimes of NADH and FAD. The discussion within this presentation will therefore focus on spectral resolved FLIM of NADH and FAD. As cellular model malignant and non-malignant oral mucosa cells were investigated. In addition human biopsies after resection of larynx carcinoma were measured. Whereas for the most aggressive mucosa cell the lifetime of NADH was increased, the lifetime of the tumor tissue seemed to decrease. The reason for the contradictory findings will be discussed.