

Oral presentation

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## Qualitative diagnostics of oral mucosa by means of multiple fluorophore analysis

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### Introduction

Early detection of oral cancer generally occurs by taking a biopsy. The measurement of specific autofluorescence of endogenous fluorophores represents a non invasive method to assess malignant tissue in terms of an "optical biopsy".

### Materials and methods

We performed fluorescence measurements of oral mucosa tissue on 19 subjects with a clinical suspicion of a malignant lesion, as well as on 7 healthy controls. A mercury vapour lamp, equipped with appropriate filter sets, was used for the excitation and spectroscopic detection of endogenous fluorophores (NADH, FAD, tryptophan). Additionally, white light remission spectra were recorded from each site. This enabled the calculation of intrinsic fluorescence spectra. Spectroscopy results were then compared to histopathological findings of the subsequently excised lesions.

### Results

Quantitative analysis indicated intrinsic fluorescence spectra of endogenous fluorophores from (pre)malignant mucosa to present significant intensity differences compared to healthy tissue. NADH and FAD in particular showed tumour specific fluorescence intensity profiles whereas for tryptophan, no distinct spectral differences were observed. Mucosa of healthy controls yielded similar

spectral patterns as did macroscopically innocuous tissues of patients presenting with neoplasia.

### Conclusion

The results of this study suggest that MFA, in conjunction with an adequate screening method (e.g. autofluorescence imaging), might be a suitable tool for the discrimination of early neoplastic changes within the oral mucosa.