

# A PLS-ANN Based Classification Model for Oral Submucous Fibrosis and Oral Carcinogenesis

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## 摘要

**BACKGROUND AND OBJECTIVES:** For effective management of oral neoplasia, autofluorescence spectroscopy was conducted on patients with different characteristics of oral lesions in vivo. This study tested the possibility of using a multivariate statistical algorithm to differentiate human oral premalignant and malignant lesions from benign lesions or normal oral mucosa. **STUDY DESIGN/MATERIALS AND METHODS:** A fiber optics-based fluorospectrometer was used to measure the autofluorescence spectra from healthy volunteers (NOM) and patients with oral lesions of submucous fibrosis (OSF), epithelial hyperkeratosis (EH), epithelial dysplasia (ED), and squamous cell carcinoma (SCC). A partial least-squares and artificial neural network (PLS-ANN) classification algorithm was used to characterize these oral lesions to discriminate premalignant (ED) and malignant (SCC) tissues from "benign" (NOM, OSF, and EH) tissues. **RESULTS:** The normalized and centered spectra of the different kinds of samples showed similar but divergent patterns. Our PLS-ANN classification algorithm could differentiate "pre-malignant and malignant" tissues from "benign" tissues with a sensitivity of 81%, a specificity of 96%, and a positive predictive value of 88%. **CONCLUSIONS:** We conclude that the PLS-ANN classification algorithm based on autofluorescence spectroscopy at 330-nm excitation is useful for in vivo diagnosis of OSF as well as oral premalignant and malignant lesions. Copyright 2003 Wiley-Liss, Inc.