

NMR METABOLOMICS BASED STUDY ON ORAL MALIGNANT DISORDERS

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Leukoplakia is an oral potentially malignant disorder (OPMD) whose evolution to oral squamous cell carcinoma (OSCC) is very common and unclear [1]. To date, the presence of dysplastic tissue in the biopsy is considered as an indicator for the malignant transformation of the lesion to cancer. However, to get a better understanding of the evolution of the malignancy, further research is needed [2]. We hypothesized that the NMR metabolomics approach may provide developments to understand alterations in the early stage of the precancerous lesion and OSCC. If OSCC were identified at an early stage, the survival rate would improve.

Metabolites from oral cavity mucosa from patients affected by OSCC and OPMD with different degree of dysplasia were characterized with HR-MAS NMR. The analysis of the spectra data was performed with exploratory multivariate statistical analysis (PCA, PLS-DA).

PLS-DA scores plot of OPMD and OSCC tissues and of leukoplakia with and without dysplasia are reported in Figure 1. OSCCs are characterized by positive LV1 values, and inspection of the loadings indicates that the level of choline is higher and that of creatine lower than in OPMDs. OPMD samples without dysplasia are more clustered while samples with dysplasia are more disperse and show probably the precancerous metabolomics alteration. OPMDs with dysplasia are characterized by positive LV2 values. Analysis of LV2 shows that creatine and glycerophosphocholine levels are higher in OPMDs with dysplasia, whereas glycine, alanine, choline and serine levels are higher in OPMDs without dysplasia.

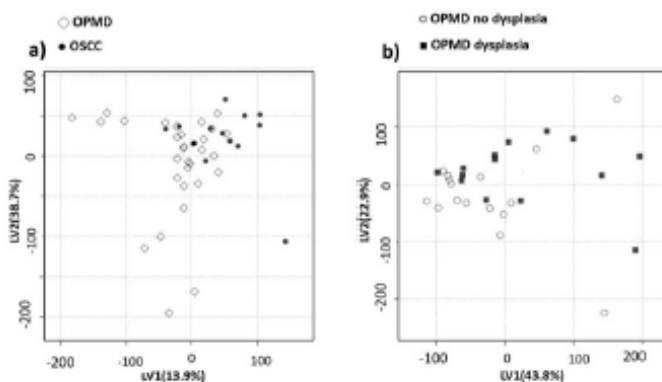


Figure 1: a) PLS-DA scores plot of OPMD and OSCC samples.; b) PLS-DA scores plot of OPMD samples with and without dysplasia.

References

- [1] Y.H.Liao Et al., *Head & Neck*, **45**,1045–1059 (2023)
- [2] C.S. Farah Et al., *Oral Dis.*, **25**, 1715-1723 (2019)