The role of Aryl Hydrocarbon Receptor (AhR) signaling pathway in oral squamous cell carcinoma (OSCC): preliminary results.

Renee Lee*[1,3], Cui Xu[1], Leticia Ferreira[2], Ana Carolina Morandini[1], Erivan Ramos-Junior[1]

[1] Department of Biomedical Sciences, [2]Department of Diagnostic Sciences, University of the Pacific Arthur A. Dugoni School of Dentistry, [3] University of California, Berkeley

OBJECTIVES: A large number of experimental and clinical studies suggest that the origin of oral squamous cell carcinoma (OSCC) is linked to environmental carcinogenesis (tobacco, alcohol). Among these environmental factors, cigarette smoking is the most studied and has been associated with increased susceptibility to OSCC by activating signaling pathways responsible for cancer initiation and progression. Besides nicotine, cigarette smoke also contains aryl hydrocarbon receptor (AhR) agonists, such as dioxin and benzo(a)pyrene. Aberrant AhR expression and AhR pathway activation are involved in several types of cancer. However, the relationship between AhR pathway activation and oral cancer progression is still unclear.

METHODS: The AhR mRNA expression in human tumor biopsies was determined by analyzing data in two publicly deposited datasets (GSE54861 and GDS4562). Cell culture: Oral cancer DOK cells were stimulated with StemXVivo EMT Inducing Media Supplement during 3 or 5 days. AhR expression was accessed by western blot.

RESULTS: In the present study, we first compared the relative expression of AhR using two GEO datasets. AhR mRNA expression was significantly higher in tumor biopsies compared to normal tissues. Next, we used an *in vitro* model to induce epithelial –mesenchymal transition (EMT) in oral cancer DOK cells to check the AhR expression. The results showed that AhR was upregulated (day 3 by 5.99 fold increase; day 5 by 5.56 fold increase) in EMT-induced cells compared to non-induced cells.

CONCLUSION: The ultimate goal of this project is to clarify whether AhR expression could serve as a diagnostic and/or prognostic biomarker to OSCC.

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