



TITLE:
GENE AMPLIFICATION AND PROTEIN EXPRESSION ANALYSIS OF EGFR AND MUTATIONAL ANALYSIS OF RAS GENE IN ORAL CANCER

RESEARCH CENTER:

School of Dental Sciences, Human Genome Center, School of Medical Sciences, School of Health Sciences, USM Health Campus

CURRENT STATUS OF PROJECT:

On going

RESEARCHERS:

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4. Azlina Ahmad (Scientific Officer)

INTRODUCTION:

Oral cancer is the sixth most common malignancy worldwide. Oral carcinogenesis is a multistep process in which genetic events occur that alter the normal functions of oncogenes and tumour suppressor genes. Aberrant expression of the proto-oncogene epidermal growth factor receptor (EGFR) and members of the ras gene family is believed to contribute towards cancer development. EGFR is frequently overexpressed in oral cancers and this was found to be the result of EGFR gene amplification in 30% of oral cancers. While point mutations in three members of the ras proto-oncogene family (H-ras, K-ras and N-ras) have been examined in oral cancers. Mutations detected primarily in codons 12, 13, or 61 of the H-, K-, and N-ras genes convert these genes into oncogenes.

OBJECTIVES:

- i. To measure the EGFR gene amplification in tumor and normal tissue using real-time PCR analysis.
- ii. To evaluate the EGFR protein expressions in tumor tissue using immunohistochemistry analysis.
- iii. To assess the correlation of EGFR gene amplification with the EGFR protein expression using statistical analysis.
- iv. To investigate the presence mutations in three members of *Ras* gene using RFLP and dHPLC techniques

MATERIALS AND METHODOLOGY:

1. Evaluation of the EGFR gene amplification and protein expression using the relative quantification real-time polymerase chain reaction and

- immunohistochemistry analysis among operated oral cancer patients in Hospital USM.
2. To investigate the presence mutations in three members of *Ras* gene, restriction fragments length polymorphism (RFLP) and denaturing high performance liquid chromatography (dHPLC).
 3. DNA sequencing will be done to confirm type of the mutations.

EXPECTED OUTCOME:

- i. Mutation of *Ras* gene can be detected in oral cancer tissue by RFLP and dHPLC analysis.
- ii. EGFR protein is overexpress in oral cancer tissue due to EGFR gene amplification.
- iii. Establishment of local database, in-term of the factors behind oral cancers affecting Malaysian population and these will help us in further understanding the principle of oral carcinogenesis at the molecular level.