

## ABSTRACT

### **The Effect of Giving Epigallocatechin Gallate (EGCG) on Expression of NFATc1 and Sclerostin on Wistar Rats in Orthodontic Movement**

**Introduction:** Orthodontic biomechanics study the biological effects of periodontal tissue due to the mechanical orthodontic treatment and some things related to mechanical strength. The biocomponent of green tea including EGCG can affect the formation of bone in the resorption and aposition through RANKL signal.

**Aims:** The aim of the study was to determine the effect of epigallocatechin gallate (EGCG) on orthodontic tooth movement and to know the mechanism of EGCG administration to the expression of NFATc1 and sclerostin (SOST) in orthodontic tooth movement.

**Methods and Materials:** Twenty four male rats were randomly divided into four groups (n=8): negatif control group (K-) without orthodontic force and without EGCG; positif control group (K+) with orthodontic force and without EGCG, (T1) with orthodontic force and EGCG day 1 until day 14, (T2) with orthodontic force and EGCG day 7 until day 14. The labial surfaces of both maxillary central incisor were installed with close coil spring to give 10g/cm<sup>2</sup> orthodontic force which connected to the first maxillary molar in the left side. The first maxillary molar has been moved and central incisor as anchorage. The result were calculated by immunohistochemical methods. Data was analyzed to examine the difference between groups by using analysis of variance then continued with Least Significant Difference (p<0.05).

**Results:** A regional histogram and distribution pattern of the NFATc1 and SOST expression after giving EGCG showed that NFATc1 and SOST expression in alveolar bone was significant increased in compression side.

**Conclusions:** The effect of EGCG can enhance the SOST and NFATc1 expression during OTM in wistar rat..

**Keywords:** Epigallocatechin gallate, NFATc1, SOST, Orthodontic Tooth Movement, Green Tea.

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## DAFTAR SINGKATAN

COX	: Cyclooxygenase
CSA	: Cyclosporin A
CSF	: Colony Stimulating Factor
CTR	: Calcitonin Receptor
EC	: Epicatechin
EGC	: Epigallocatechin
EGCG	: Epigallo Catechin Gallate
IL	: Interleukin
ODF	: Osteoclast Differentiation Factor
OPG	: Osteoprotegerin
OTM	: Orthodontic Tooth Movement
MCSF	: Macrophage Colony Stimulating Factor
NFATc1	: Nuclear Factor Activated T cell 1
PDL	: Periodontal Ligament
RANK	: Receptor Activated Nuclear Kappa Beta
RANKL	: Receptor Activated Nuclear Kappa Beta Ligand
SOST	: Sclerostin
TRANCE	: Tumor Nuclear Factor Related Activation Induced Cytokine
TRAP	: Tartrate Resistance Acid Phosphatase
VEGF	: Vascular Endothelial Growth Factor
VSMC	: Vascular Smooth Muscle Cell
WnT	: Wingless and Int-1 (Integrated)