RANKL, RANK and OPG expression in DMBA-induced hamster buccal pouch carcinomas

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Abstract

Purpose: The purpose of the present study is to investigate the immunohistochemical of NF-κB (RANK), NF-κB ligand (RANKL) and osteoprotegerin (OPG) in DMBA-induced hamster buccal carcinomas.

Materials and methods: Immunohistochemical analysis of RANK, RANKL and OPG protein expression was performed in DMBA-induced pouch squamous cell carcinogenesis. Fifty outbred, young (6 weeks), male Syrian golden hamsters were randomly divided into three experimental groups (each group consisting of 10 animals treated with DMBA for 3-, 7- or 14-weeks), and two control groups (with 10 animals in each).

Results: Cytoplasmic staining of RANKL proteins was confined to the basal cell layer of all cases in all 3-week DMBA treated pouch-tissue, untreated and mineral oil treated pouch-tissue. In addition, cytoplasmic RANKL staining was observed in all specimens of 7- and 14-week DMBA treated pouch-tissue. A similar staining pattern is noted for RANK protein in all specimens of DMBA treated pouch-tissue studied. An absence of staining of RANK protein is noted for all untreated and mineral oil treated pouch-tissue. Conversely, weakly cytoplasmic OPG positivity was confined to

the whole epithelial layer in 7- and 14-week but was not present in all 3-week DMBA treated pouch-tissue, untreated and mineral oil treated pouch-tissue.

Conclusions*:* The results of this study demonstrate the association between RANK, RANKL and OPG expression in this experimental model system for oral carcinogenesis, and suggest that osseous destruction by SCC in the human oral cavity appears to be mediated by the cancer cell itself through the activation of osteoclasts via a RANKL/RANK/OPG pathway.