

## 0741 Characterization and Testing of New Buccal and Gingival Tissue Models

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**Background:** Three dimensional, organotypic tissue models offer product development scientists an efficient means of testing new formulations to optimize product efficacy while reducing irritation. Highly reproducible tissue models of the oral mucosa will facilitate the development of new oral care products.

**Objective:** To characterize newly developed oral mucosa tissue models and to investigate their response to a battery of oral care products.

**Methods:** Using serum free medium, normal human oral keratinocytes were cultured at the air liquid interface; in some cultures, dendritic cells (DC) were also incorporated. The structure, protein expression, and lipid content of the resulting three dimensional tissues were characterized using histology, immunohistochemistry, and thin layer chromatography, respectively. Using the MTT assay, reproducibility was monitored by determining the exposure time necessary for 1% Triton X-100 to reduce tissue viability to 50% (ET-50). Finally, ET-50s for 15 commercially available oral care products were determined.

**Results:** Histological cross-sections reveal non-cornified (ORL-200) or cornified (GIN-100) tissues 8-12 cell layers thick. Cytokeratin 13 & 14 and human beta-defensin expression is similar to that observed in human tissue explants; CD1a+/HLA-DR+ DC were also observed. Ceramide 2 (ORL-200) and Ceramides C1, C2, and C3 (GIN-100) were present similar to results for human buccal and gingival tissue, respectively. During 2005, the Triton ET-50 for ORL-200 tissue lots averaged  $58 \pm 22$  minutes (n=17); the ET-50 for the GIN-100 lots averaged  $8.1 \pm 0.94$  hours (n=9). Using the ORL-200 tissue, ET-50s for mouthwashes, toothpastes, and oral cleansers ranged from 2.0 to >18 hr.

**Conclusions:** The in vitro tissue models show good correspondence to human explant buccal and gingival tissue in terms of structure, protein expression, and lipid content. The reproducibility of the tissues is very good and differences between the damaging effects of various oral care products can be readily determined. NIH support: R44DE13277-03

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