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Title: Characterization of two epithelial cell air-liquid interface (ALI) culture models for human healthy nasal mucosa and nasal polyps

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Body: Background: Primary human airway epithelial cells cultured in an air-liquid interface (ALI) develop a well-differentiated, polarized, and pseudostratified epithelium. Objective: To obtain and characterize human nasal mucosa and nasal polyp well-differentiated epithelia using an ALI culture system. Methods: Epithelial cells were obtained from 7 nasal mucosa (NM) and 9 nasal polyps (NP), and differentiated in ALI culture during 28 days. At different times (0, 7, 14, 21, and 28 days) were performed: ultrastructure study by electron microscopy (SEM, TEM); mucous and serous secretion by ELISA; cytokines and chemokines analysis by CBA (Cytometric Bead Array); and β-tubulin IV (cilia marker), MUC5AC (goblet cell marker) and p63 (basal cell marker) expression by immunocytochemistry. Results: In both NM and NP ALI cultures, pseudostratified epithelium with ciliated, mucus-secreting, and basal cells were observed by SEM and TEM at days 14 and 28. Displaying epithelial cell re-differentation, β-tubulin IV (ciliated cells) and MUC5AC (goblet cells) positive cells increased while p63 (basal cells) positive cells decreased overtime. In NP cultures MUC5AC secretion increased overtime compared to day 0 (100%), being significantly ($p<0.05$) higher than in NM cultures at day 14 [134% vs 96%], whereas no differences were found overtime in MUC5B (increased) and lactoferrin secretion. IL-8 and GM-CSF secretion were significantly ($p<0.05$) increased in NP compared to NM at day 28 (IL-8: 4222±1278 vs 1598±502 pg/ml; GM-CSF: 10±3 vs 2±3 pg/ml). Conclusion: The ALI culture system provides a well-differentiated epithelium from human nasal mucosa and nasal polyp.