

Characterization of a Marker for Tracheal Basal Cells

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Abstract

An IgM monoclonal antibody (1D9/B3) is characterized, which specifically recognizes basal cells of the upper airway epithelium. Although morphological features have been used to follow cell lineage and differentiation, an objective assessment of differentiation can be enhanced by characterizing the expression of specific antigens that form the phenotypic profile of specialized cells. Mice were immunized with rabbit tracheal basal cells that had been obtained by pronase digestion and purified into a subpopulation of basal cells by flow cytometry. Six immunization experiments produced five hybridomas specific to epithelial cells. A hybridoma whose supernatant immunocytochemically stained the basal cell subpopulation of rabbit tracheal cells was selected. The antibody reacted with tracheal basal cells in rabbit, rat, sheep, pig, and human tracheal sections, and in cultured monolayers of tracheal epithelial cells of the same species. The antibody did not react with the basal cells of other rabbit tissue, including the skin, or other rabbit epithelia. Confocal microscopy and exposure of tracheal epithelial cells to fluorescent-tagged monoclonal antibody 1D9/B3 prior to loading on to flow cytometry showed that the basal cell antibody recognized an intracellular epitope. The epitope for the 1D9/B3 antibody was characterized by Western blotting. The 1D9/B3 antibody appears to be a distinct and specific marker to the airway epithelial basal cell and will be useful in studies of airway epithelial differentiation, injury, and regeneration.