

IDENTIFICATION AND CHARACTERIZATION OF M CELLS IN THE MAMMALIAN CONJUNCTIVA

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ABSTRACT

The M cell is a morphologically and functionally distinct epithelial cell found in the follicle associated epithelium (FAE) above organized lymphoid tissue at distinct locations along mucosal surfaces. By sampling antigens from the mucosal surface, M cells play a key role in protection of mucosal surfaces through induction of the mucosal immune system. M cells have been identified in many mucosae, but their presence in the ocular mucosa has been debated. This dissertation examines the hypothesis that the Guinea pig conjunctival FAE contains an antigen-sampling M cell.

A cell with typical M-cell characteristics was identified in the conjunctival FAE using a variety of microscopy techniques. These putative M cells selectively bound and translocated the sialyllactose-specific lectin *Maackia amurensis* lectin-I to underlying immune cells, which demonstrates that these cells possess the quintessential function of M cells: transcytosis of macromolecules. Conjunctival M cells also translocated a sialyllactose-binding strain of nontypeable *Haemophilus influenzae*, providing the first evidence of M-cell-mediated uptake of bacteria across the conjunctival epithelium.