LECTIN BINDING TO DOGFISH, SQUALUS ACANTHIAS, RECTAL GLAND

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In the present study we used lectins (proteins and glycoproteins mainly from plant origin which have the unique property to bind to distinct saccharide configurations) to determine whether some can be identified that bind to selective portions of rectal gland cells.

Frozen sections of rectal glands perfused in vitro with or without dibutyryl cyclic AMP 5 x 10^{-5} M and theophylline 2.5 x 10^{-4} M were incubated in vitro with fluorescein isothiocyanate labeled lectins and examined by fluorescence microscopy.

<u>Triticum vulgaris</u> lectin, specific for sialic acid and N-acetyl glucosamine residues of glycoconjugates, was found to label uniformly the cytoplasm of all rectal gland cells, whereas a lectin from <u>Arachis hypogaea</u>, specific for the terminal disaccharide galactose-N-acetyl galactosamine reacted primarily with the cells lining the central ducts. <u>Ricinus communis</u> agglutinin bound to the apical cell membrane exclusively. An interesting and unexpected finding was that under basal condition <u>Helix pomatia</u> agglutinin, specific for N-acetyl galactosamine, reacted with an estimated 30% of tubular epithelial cells labeling them uniformly (Fig.1). However, after stimulation of salt secretion by the rectal gland by infusion of theophylline (2.5 x 10^{-4} M) and cyclic AMP (5 x 10^{-5} M) virtually all cells became positive for this lectin (Fig.2). No other lectin among nine examined showed similar changes after stimulation.



Fig. 1. Frozen section of dogfish rectal gland stained for FITC-HPA. One third of the tubular profiles are brightly positive, whereas in some tubules only occasional cells are stained (arrows).



Fig. 2. FITC-HPA staining after stimulation of chloride secretion with theophylline and cAMP. All epithelial cells are positive. x360

These findings show that some lectins bind to specific sites within the rectal gland cells indicating a polarized distribution of cellular glycoconjugates in these cells. In addition, when salt secretion is stimulated, the binding of <u>Helix pomatia</u> agglutinin increases suggesting that a glycoconjugate is associated with chloride secretion. Thus, lectins may prove useful in the further characterization of the various cell types of the rectal glands as well as to isolate and characterize the inducible glycoconjugates.

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