

Fine Structure of Secretory Epithelia

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1). Fine structure of the chief cells of the salt glands of sea gulls. In collaboration with Dr. Knut Schmidt-Nielsen a series of young black-backed gulls were experimentally prepared, fixed and embedded for electron microscopy. Intravenous and intraluminal injections of particulate suspensions were made for use in exploring cellular boundaries in active and resting glands.

2). The fine structure of the gills of *Fundulus* is of interest in relation to their reputed role in salt excretion. Accordingly, gills of suitably conditioned fish were fixed and embedded for subsequent electron microscopy.

**Competitive Inhibition Involving the Secretion
of PAH and Diodrast by the Agglomerular Kidney of *Lophius***

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Although it is commonly accepted that p-aminohippuric acid (PAH) and 3, 5-diiodo-4-pyridone-N-acetic acid (Diodrast) compete with one another for active transport by the proximal segment of various vertebrate renal tubules, the precise nature of their reciprocal competition is not well established. The purpose of this investigation is, therefore, to elucidate some of the quantitative characteristics of this competitive inhibition expressed on a molar basis.

Lophii (14 in total) were exclusively used in this study. The fish were injected with a large dose of either PAH or Diodrast (i.m.) to attain plasma levels high enough ($0.5 \mu\text{M}$ per ml) to insure maximal transfer rates (T_m). After the control transfer maximum for the corresponding substance had been determined for two periods, a dose of the competitor was administered i.m. (i.e. Diodrast or PAH) to give plasma concentrations either equal to or $1/5$ the molar concentration of the substance previously administered. Then, after a period of equilibration, the secretory rates of both substances were determined for 3 subsequent periods.

When the tubules were supplied with either PAH or Diodrast alone, the transfer maxima averaged 23.1 and $5.7 \mu\text{M/hr/Kg}$ respectively for PAH and Diodrast. However, after equimolar concentration of the competitor substance was achieved in plasma, the transfer maximum of PAH dropped to $0.9 \mu\text{M/hr/Kg}$ while that of Diodrast fell to 4.3, indicat-