comparison with material fixed in the antimoniate reagent.

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## 1966 #14

## FINE STRUCTURE OF THE RECTAL GLAND OF <u>Squalus acanthias</u> AFTER INCUBATION OF TISSUE SLICES IN ISOMOTIC AND HYPEROSMOTIC SOLUTIONS

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Slices of the rectal gland of <u>Squalus acanthias</u> were incubated for periods up to 12 hours in chilled Hogben's solution and in solutions with added sucrose or sodium chloride. Experiments on indirect osmometry of the slices done in 1964 showed characteristic shrinkage curves in sucrose solutions and shrinkage followed by swelling in strong sodium chloride solutions. During 1965 similarly treated slices were fixed for electron microscopy after appropriate periods of incubation in chilled solutions gassed with 95%  $O_2$  and 5%  $CO_2$ . Subsequent examination revealed that essentially intact fine structure was maintained for several hours with evidence of continuing secretory activity in the control Hogben's solution.

With addition of 0.6 M sucrose the slices shrank to 74% of initial volume after 24 hours. Despite prolonged incubation the fine structure remained intact. There was reduced cell volume and generally increased electron density but evidence of continuing vacuole formation at cell bases.

With addition of sodium chloride two morphologies result, one during shrinkage and another during swelling. During shrinkage there is dislocation and clumping of chomatin granules, clumped cytoplasmic organelles, shrunken and dense mitochondria and decreased cell volume. The lateral cell surfaces become attenuated and narrow and there are changes in the apical terminal web.

Slices immersed in 1.0 M sodium chloride begin to swell 2-5 hours after incubation with deterioration of fine structure. It is clear that previous reports by others of anomolous swelling in such solutions is not an osmotic response of viable cells.

In suitable media, slices of the rectal gland provide favorable material for correlation of fine structure with secretory activity maintaining structural integrity for long periods under a broad range of conditions.

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## 1966 #15

**NEUROSECRETION IN Cucumaria** 

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Electron microscopic examination of the haemal vessels of this holothurian reveals the presence of nerve strands with axons containing large dense membrane-bounded granules. These are of particular interest since there is only fragmentary evidence of neurosecretion in echinoderms. The nerve strands pass between the cell processes of epithelial cells and are distributed