

EFFECTS OF AN ELASMOBRANCH AMINOSTEROL (1436) UPON RECTAL GLAND AND KIDNEY IN *SQUALUS ACANTHIAS*

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Several naturally occurring aminosterols found in elasmobranch tissues have interesting biological properties. The effects of one of these (1436), composed of spermine attached to a sterol skeleton, was studied in isolated perfused rectal glands of *Squalus acanthias* as well as intact specimens of this species.

In isolated rectal glands perfused with shark Ringer's solution, with glucose as the metabolic substrate, gassed with 99% O₂, 1% CO₂ (Methods Enzymol, 192: 754-66, 1990), 1436 was infused for 30 minutes at concentrations ranging from 1 to 10 mg/L and increased chloride secretion in a way proportionate to dose. Two unusual features of this effect were, 1) the chloride concentration of secreted fluid fell rather than rising as secretory volume increased, while urea concentration in the duct fluid rose reciprocally; 2) the increase in fluid secretion began only slowly, during the third 10-minute period of 1436 administration, and continued long after 1436 had been stopped. The effect of 1436 resembles that seen with the calcium ionophore, ionomycin. In a single experiment carried out by Dr. R. Greger and his associates, an increase in internal calcium was observed by fluorescence measurement in a rectal gland tubule exposed briefly to 7 mg/L of 1436.

In 6 live free-swimming specimens of *Squalus acanthias* weighing 1.5 to 2 kg. 1436 was injected directly into the dorsal aorta in doses varying from 1.2 to 10 mg per kg and the urinary bladder or rectal gland duct was catheterized. At 10 mg/kg the shark died after 1 hour. At a dose of 3 mg/kg the animal appeared lethargic for several hours; urinary flow did not increase. Injections of 1.2 mg/kg produced variable increases in rectal gland secretion in which the concentration of chloride remained unchanged or increased, in contrast to the results obtained in isolated perfused glands.

These preliminary experiments suggest that the naturally occurring aminosterol, 1436, might exert physiological and perhaps toxic effects in the rectal gland and other tissues of the shark by increasing intracellular calcium.

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