

INTESTINAL TRANSPORT OF SUGARS AND AROMATIC AMINO ACIDS IN MARINE FISH AND SELECTED FRESH WATER FISH

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Our studies in the Summer of 1964 have shown that certain aromatic amino acid derivatives were transported across the mucosal membrane of the flounder's intestine against a concentration gradient, while glucose was not transported. It was the aim of the present investigation to pursue this problem in other marine fishes and study the structural specificity of this transport mechanism. The technique of everted intestinal sac or isolated mucosal membrane as described in our previous publications was used. D-galactose and L-tryptophan in different concentrations were placed on both the mucosal and serosal sides. The sacs or mucosal membranes were then incubated at 25°C for an hour. Inulin was used to estimate the flux movement of water. Totally eight species of marine fishes as well as two species of fresh water lungfishes were studied. They can be grouped into 3 classes according to their intestinal transport function.

- I. Both galactose and L-tryptophan were transported in Fundulus heteroclitus, Myoxcephalus octodecimspinosus, Squalus acanthias,* and Lepidosiren paradoxa*
- II. L-tryptophan was transported, but galactose was not transported in Pseudopleuronectes americanus, Hemitripterus americanus, Pollachius virens, and Macrozoares americanus
- III. Neither galactose nor L-tryptophan was transported in Cyclopterus lumpus or Propterus aethiopicus

The structural specificity of sugars and amino acids was further studied on the intestine of the Fundulus heteroclitus. It was found that D-glucose, D-galactose and 3-O-methylglucose were transported across the intestinal mucosa against a concentration gradient, but levulose, mannose, D-xylose, sorbose and alpha-methyl-glucoside were not transported. The amino acids, L-tryptophan and L-tryosine, were transported, but D-tryptophan was not transported against a concentration gradient. The transport of L-tryptophan was temperature dependent and was inhibited by L-phenylalanine and 2,4-DNP.

FINE STRUCTURAL ACCOMMODATIONS FOR MATERNOFETAL EXCHANGE IN Squalus acanthias†

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The purpose of the summer's work has been to examine electron microscopically the membranes of the dogfish across which pseudoplacental/placental exchanges take place. In the spiny dogfish, fetal and maternal contributions to the exchange system are not closely apposed; and it has been generally assumed that the system functions solely in respiratory exchange. A better knowledge of the changes which allow for such functional adaptation, both in the maternal mem-

*The technique of mucosal membrane was used in these two fishes.

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