1964 #1

BROMINATION OF FLUORESCEINS BY THE UTERUS OF THE DOGFISH

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It has been reported that various phthalein dyes are brominated by the pregnant dogfish uterus <u>in vivo</u>. We have also shown that fluorescein was readily brominated to eosin, thus the sulfonic acid moiety could be replaced by the carboxylic group without adverse effect. The following bromofluoresceins were found to be brominated to eosin 48 hours after instillation in the uterus: 4-bromo, 2,4-dibromo, 2,7-dibromo, 4,5-dibromo, 2,4,5-tribromo, and 2,4,7-tribromofluorescein. After intrauterine administration of fluorescein, various bromofluoresceins could be recovered in 6, 12, and 24 hours and after 48 hours only eosin could be recovered, implicating a stepwise bromination. The role of the bromination system in the physiology of the dogfish is obscure and is being further investigated.

1964 #2

TRANSPORT OF ORGANIC DYES BY THE ISOLATED CHOROID PLEXUS OF ELAS-MOBRANCHII

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Recent observations have shown that isolated dogfish choroid plexus moved chlorphenol red an organic acid dye from an external artificial salt medium, representing the CSF, across the choroidal epithelial cells into the capillary lumen in a manner consistent with an active transport process (Rall and Sheldon, Biochemical Pharmacology, 1961, 11, 169). We have shown that fragments of choroid plexus (1 mm square) from dogfish pups (also lemon sharks, N. brevirostris) when placed into a dogfish or shark ringers media containing chlorphenol red also transported the dye into the capillary lumen. Various organic acidic and basic dyes were used in experiments with isolated fragments from adult dogfish choroid plexus (S. acanthias). The table below reports that acidic dyes such as phenol red, chlorphenol red, bromcresol green, indigo carmine and the basic dye neutral red were concentrated in the capillary lumen. On the other hand, both bromphenol blue and bromcresol green were taken up both by the cells and the lumen. Also both these dyes were taken up in the presence of 2,4-Dinitrophenol (DNP) whereas DNP inhibited the uptake of phenol red, chlorphenol red, bromcresol purple, and indigo carmine. The basic dye neutral red seemed to be taken up in the presence of DNP. These experiments are similar to those reported for dye uptake by the isolated proximal tubule of the flounder kidney (Forster and Hong, J. Cell. Comp. Physiol., 1958, 51, 259).

Dye	Molecular Weight	Uptake 30-60 min.		Uptake in presence of DNP 10 ⁻⁴ M	
		Lumen	Cell	Lumen	Cell
Phenol red	354	+	-	-	-
Chlorphenol red	424	+		0-0	-
Bromcresol purple	540	+	-		-
Bromphenol blue	670	+	+	+	+
Bromcresol green	698	+	+	+	+
Indigo carmine (sulfonic acid)	466	+		-	-
Neutral red (basic dye)	289	+	-	+	-

Preliminary observations also suggest that only isolated fragments of the choroid plexus could concentrate dyes. Thus choroid plexus attached to the brain failed to concentrate chlor-phenol red. More definitive work needs to be done with regard to this problem.

1964 #3

REPORT ON RESEARCH

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Investigations pursued intermittently concern the biology of the ciliates which are variously associated with the sea urchin <u>Strongylocentrotus droebachiensis</u>. Of the numerous observations that have been reported, the following are worthy of special mention.

In the first study of the series (Beers 1948 <u>Biol. Bull.</u> 94: 99-112), it was shown that division in several of the common endozoic ciliates, which are holotrichs, is a cyclical phenomenon, and it was suggested that an inherent rhythm is involved. More recent studies of an experimental nature have shown, however, that the outbreaks of division are usually correlated with the feeding habits of the host and thus are not inherent.

One of the ciliates, identified provisionally as <u>Euplotes balteatus</u> (Beers 1954 <u>Jour. Proto-</u><u>zool</u>. 1: 86-92), is of special interest for two reasons: first, it is a hypotrich rather than a holotrich and secondly, it seems to be adapting to endozoic life in the urchin. A recent revision of the genus <u>Euplotes</u> by the French protozoologist Michel Tuffrau directs attention to the importance of the dorsal kinetics and argyrophilic network as stable specific characters. A study of these structures is in progress in an effort to identify correctly the species from the urchin and to establish its relationship to free-living species.

The studies have provided the first record of the occurrence on echinoids of a ciliate which is obligately epizoic rather than endozoic. This ciliate, a peritrich described as <u>Urceolaria</u> <u>spinicola</u>, is found on the spines and pedicellariae. A study of its autecology is in progress, with special reference to its distribution on individual hosts, on hosts of different ages and on hosts from different localities.

Recent publications follow, excluding preliminary and progress reports.