1967 #36

ELECTROLYTE PATTERNS OF DOGFISH CARTILAGE (Squalus acanthias)

Gearald P. Rodnan, H. Victor Murdaugh, Carroll E. Cross, J. Eugene Millen, and Eugene D. Robin, Department of Medicine, University of Pittsburgh School of Medicine, Pittsburgh, Pa.

The possession of cartilage rather than bone in the skeleton represents a major and relatively unique feature of the elasmobranchs. However, little is known concerning the electrolyte composition of this tissue. Nor are there data concerning its role in electrolyte and acid-base metabolism.

Plasma and cartilage were obtained from nine adult female dogfish and analyzed for total water; Na^+, K^+, and Cl^- concentrations. In addition, sucrose was administered intravascularly and the magnitude of the sucrose space in cartilage determined. Finally, in five animals, analyses of plasma and cartilage electrolytes were performed four hours after the intravascular infusion of Na HCO_3.

The results are given in Table 1.

Table 1

	Plasma	Cartilage	$\frac{\text{Cartilage}}{\text{Plasma}}$
Na^+ mEq/L H_2O	267	336	1.23
Cl^- mEq/L H_2O	278	234	0.84
K^+ mEq/L H_2O	4.6	9.2	2.00
Sucrose space	20%		

It appears that $\frac{(Na^+)c}{(Na^+)p1}$ is equal to $\frac{(Cl^-)\ P1}{(Cl^-)\ c}$ suggesting that these ions may be in electrochemical equilibrium across cartilage cell membranes. Assuming that this is true the calculated transmembrane potential of cartilage cells would be -4.2 millivolts.

Marked increases in plasma HCO_3^- produce no substantial change in cartilage Na^+ of K^+ concentration suggesting that this tissue is not a major site of buffering by ion exchange.

The electrolyte pattern of dogfish cartilage appears to differ markedly from that reported for mammalian cartilage and continued studies of the role of this tissue in the general electrolyte metabolism of the dogfish appear warranted.

1967 #37

THE PHARMACOLOGY OF ETHYL m-AMINOBENZOATE (MS222) IN THE DOGFISH, Squalus acanthias

Vincent G. Stenger and Thomas H. Maren, University of Florida, Gainesville, Fla.

The permeability of the gill membrane to various drugs was studied in 1966 by two groups, Maren et al. (Bull. MDIBL 6:25, 1966) and Rall et al. (Bull. MDIBL 6:31, 1966). A direct correlation exists between lipid solubility and gill clearance, the lipid soluble drugs being cleared