

in the fish cells, and carbonic anhydrase is inhibited, the system cannot move, because conditions are the same inside and outside the cell. These speculations are set down as incentive to further study.

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1965 #28

UREA SPACE IN Squalus acanthias

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Urea is an important chemical factor in osmotic regulation in elasmobranchs. High concentrations of urea found in body fluids of these species are apparently related to very low extra-renal and renal loss of metabolically generated urea. In addition, certain elasmobranch tissues appear to have special mechanisms for urea transport. In mammals, it is generally accepted that cell membranes are freely permeable to urea, and that final volume distribution of urea is equal to total body water. Little information is available concerning the volume of distribution of urea in elasmobranchs.

The volume of distribution of C^{14} urea was measured in 9 animals and compared to total body water as measured by n-acetylantipyrine (NAAP), a substance known to distribute itself throughout total body water. The volume of distribution was also compared to the volume of distribution to chemical analogues of urea, methylurea and thiourea. The C^{14} urea space was found to be 64% of total body weight as compared to NAAP space of 66% total body weight. These values were not significantly different. Methylurea and thiourea spaces were essentially the same as urea space. The correspondence between urea and NAAP spaces suggests equality of urea concentration across most cell membranes of this animal at equilibrium.

1965 #29

STUDIES OF LACTATE METABOLISM IN Squalus acanthias

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Measurements of blood lactate concentrations in the spiny dogfish, Squalus acanthias, have demonstrated concentrations that are substantially higher than those reported in other vertebrates. The mechanism of this high blood lactate concentration was investigated. In one phase of the study arterial lactate concentration was measured in 3 groups of animals: group A - 12 fish maintained in a salt water pen in the laboratory; group B - 12 fish maintained in live cars floating in the bay; and group C - 11 fish sampled on the boat within one minute of capture by hand line. The values were as follows: group A, 9.1 ± 5.3 mEg/L; group B, 6.9 ± 4.3 mEg/L; group C, 1.0 ± 0.2 mEg/L. The resting endogenous blood lactate concentrations of dogfish in their natural habitat appear to be similar to those of man.

The ability of elasmobranch gill to excrete lactate was investigated. Lactate concentrations