

THE CONTROL OF VENTRICULAR FLUID PRODUCTION IN THE DOGFISH

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Ventricular fluid (VF) production rate was determined in dogfish (*S. acanthias*) by perfusing an inulin containing VF-like buffer from the lateral ventricle to the cerebellum at a steady rate. By knowing the rate of inflow, and the inulin concentration in the inflow and the outflow, it is possible to calculate VF production rates. Each animal was given curare, and gills were perfused with running sea water. Needles were introduced stereotactically into one of the lateral ventricles and into the cerebellar ventricle. After satisfactory ventricular perfusion had been attained, a 2-3 hour control period was run. Ouabain or acetazolamide was then added to the perfusing fluid and VF production rates were determined for 4-6 hours. Several fish, instead, received intra-arterial ouabain. In 4 fish, using 10^{-3} M ouabain, control production averaged 0.0060 ml/min, and a 63% decrease to 0.0022 ml/min occurred after addition of ouabain to the perfusate. In 3 fish concentration of ouabain in the perfusate was 10^{-5} M; their average control production was 0.0070 ml/min, which decreased 44% to 0.0039 ml/min. In 2 fish using 10^{-7} M ouabain in the perfusate no significant change in VF production (from 0.0041 to 0.0036 ml/min) was noted. In giving intra-arterial ouabain to dogfish it was noted that the approximate LD 50 for this drug was 0.1 mg/kg. Higher doses produced an initial increase in arterial pressure with increase in pulse pressure and heart rate, followed by slowing of heart rate, decrease in blood pressure and standstill of the heart in systole about 10-20 minutes after the administration of the drug. In 2 fish 0 mg/kg intra-arterial ouabain was tolerated well as determined by continuous arterial pressure monitoring. However, no change in VF production rate (from 0.0051 to 0.0052 ml/min) occurred. In 3 fish perfusing fluid containing 0.1 mg/ml of acetazolamide was used. This caused a 27% reduction in VF production rate (from 0.0056 to 0.0041 ml/min). This compares with a previously reported 50% reduction in VF production rate when acetazolamide is given intra-arterially at 3 mg/kg (Comp. Biochem. Physiol. 12, 171, 1964).

It thus appears that VF production rate in the dogfish is significantly reduced by high concentrations of intraventricular ouabain. Similar results may be obtained in the cat (Am. J. Physiol. 206, 1165, 1964). This reduction of VF formation rate may occur because of inhibition of Na-K activated ATP-ase by ouabain. It also appears that carbonic anhydrase is important in the regulation of VF production, as the strong inhibitor of the enzyme, acetazolamide, caused a significant reduction in VF production both when given into the ventricular system and into the bloodstream.

THE EFFECT OF FLUORIDE ION ON THE LONGEVITY OF *Campanularia flexuosa* HYDRANTHS

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Ageing might be considered according to Strehler a progressive loss of ability to adapt to