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ESTIMATE OF CEREBRAL BLOOD FLOW IN *Squalus acanthias*

Barbara Kent, Ph.D., Marjorie Peirce and E. Converse Peirce II, M.D. Veterans Administration Hospital, Bronx, New York

Arteries directing blood to the brain arise rostral to the confluence of the efferent branchials of the first gill arch. Because there is no convenient injection site it has not been possible to determine brain blood flow with conventional intravascular injection methods. In this study small (15μ) diameter microspheres injected into the cardiac ventricle are used to estimate blood flow to the brain. Seven restrained male dogfish (1.7 ± 0.2 Kg) prepared as described earlier (Bull. MDIBL 26, 1971) were injected with 1 ml (1μCi) amounts of ^{85}Sr tagged 15μ diameter microspheres (3M). After an hour the fish were killed and the gills, brain, and kidneys were dissected and weighed. Analysis proceeded as described in report #29 of this bulletin. An average of 69 percent of the 15μ diameter microspheres were caught in the gills. Of the remaining 0.16 ± 0.02 percent were found in the brain and 0.37 ± 0.10 percent in the kidneys. Although the arterial blood supply to the brain of the dogfish is part of the systemic circulation and is in parallel with it there is no central point for injection of microspheres on the arterial side of the circulation that will include the brain. Microspheres injected into the heart that clear the gill capillaries will be carried in the systemic circulation in proportion to blood flow. Thirty-one percent of microspheres 15μ in diameter will pass through the gills. This is not surprising when one considers the diameter of a dogfish erythrocyte is reported to be 15μ also (Kisch, Exp. M. & Surg., 1951). The minimum estimate of blood flow to the brain based on percent of 15μ microspheres is 0.03 ml/gm/min. This is a small fraction of the blood flow through the first gill arch (2.76 ml/min, Bull MDIBL 26, 1971) and closely approximates average blood flow (0.023 ml/gm/min, Bull MDIBL 29, 1967) in the fish. This work was supported by the Veterans Administration Hospital, Bronx, New York 10468, Project #7240-03.

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BLOOD FLOW DISTRIBUTION IN *Squalus acanthias:* A SEQUEL

Barbara Kent, Ph.D., Marjorie Peirce, and E. Converse Peirce II, M.D., Veterans Administration Hospital, Bronx, New York

In a previous report (Bull. MDIBL 26, 1971) a preliminary study of blood flow distribution in *S. acanthias* was described using the tagged microsphere method. The number of tissues studied has been expanded and the results are reported here.

Six male dogfish (1.8 ± 0.4 Kg) swam unrestrained in a 0.3 M^3 tank supplied with fresh running sea water. An injection catheter was threaded from the caudal artery up the dorsal aorta to the level of the fifth gill arch. The fish were given 1000 units of heparin. Blood was sampled from the catheter at time 0 when microspheres were given at 30 minutes and at 90 minutes when the fish were killed.