

ORIGIN OF THE SPINDLE CELL IN Myxine

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The marine cyclostome, Myxine glutinosa, appears to occupy a pivotal evolutionary position between invertebrates, in which the sophisticated and biologically complex immune mechanisms of the vertebrates are absent, and the other cyclostomes in which these mechanisms are relatively intact. Consequently, it has been of interest to examine in detail the immunologic capacity of this species from the cellular viewpoint.

Previously, it was established that the peripheral blood of Myxine contains a lymphoid cell which, by morphologic and electron micrographic criteria, resembled that of the lamprey and higher vertebrates. The objective of this investigation was to examine in further detail certain reactions of the hagfish lymphoid cells. Two significant observations were made during 1969.

First, it was established that the spindle shaped cell which apparently derives from the pronephros rounds up and becomes lymphoid in character in vitro. This was found to be a temperature dependent process. At temperatures between 15° and 20° C the spindle shape was re-acquired. In some ways the phenomenon resembled the deformation of a sickled erythrocyte under low oxygen tension in sickle-cell disease of man. The significance of this observation is yet to be understood, and cells taken under a variety of conditions are being examined by electron microscopy at the present time.

The other major endeavor was to determine whether mixed cell cultures of allogeneic peripheral lymphoid cells were capable of DNA incorporation in vitro. Cultures were established between a number of randomly selected animals in which 5×10^6 cells from each donor were mixed in a medium especially devised to support these cells. In those cultures which were kept 30 days at 18° C and pulsed for an additional 7 days with tritiated thymidine, a significantly higher incorporation of tritiated thymidine was observed in the allogeneic than in the syngeneic cultures in two out of three animals in which satisfactory experiments were possible. If these experiments are verified by additional similar studies, it would indicate there is an in vitro reactivity of lymphoid cells which corresponds to the chronic homograft rejection phenomenon which has been described recently by Hildeman and colleagues.

LOCALIZATION OF THE DILUTING SEGMENT IN THE DOGFISH NEPHRON: A MICRO-PUNCTURE STUDY

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To localize the segment of the dogfish nephron in which low water permeability permits the generation of hypoosmotic tubular urine, samples of fluid from progressively more distal segments were taken by micropuncture and analyzed for osmolality using a Clifton cryostat. The experimental animals were those described in report #40, this volume; 9 from seawater and 5 from diluted seawater environment.

Fish were prepared as described (see below); a lower midline incision was made and the