1963 #25

HISTOCHEMICAL STUDIES OF LYSOSOME ACTIVITY IN HYDROID REGRESSION-REPLACEMENT CYCLES

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The regression-replacement cycle of Campanularia flexuosa, a calyptoblastic hydroid, was studied histochemically to determine the possible relationship between lysosome activity and this remarkable senescence cycle. The distribution and fluctuation of acid phosphatase, cathepsin and aryl sulfatase were observed as an index of lysosome action.

The individual hydranth was a longevity of 3-7 days. During this period the hydranth can capture food, digest the food and supply the adjacent members of the colony with the captured nutrients. At the first visible onset of senescence, the tentacles withdraw into the hypostome and the individual undergoes an autolytic digestion. Strehler has studied the acid phosphatase activity (Gomori) during the cycle using this enzyme as an index to lysosome activity and areas of cellular death. Using Burstone techniques for acid phosphatase, our data corroborates Strehler's findings that acid phosphatase activity is associated with regression and lysis. The aryl-sulfatase data indicates a sudden increase in lysosome activity paralleling senescence and increasing progressively over the period of regression. Preliminary analysis of cathepsin B data have not agreed with the previous observations; there not being a significant increase in activity during senescence. This is being checked. High acid phosphatase, aryl sulfatase and cathepsin B are found in regions of new growth and in regions of digestive activity. The relationship of lysosome activity and phagocytic activity is being investigated.

Electron microscope studies of the regressing hydranth have revealed a structure in tentacle cells which might be identified as a lysosome. The relationship between stage of regression and lysosome fragility is now being investigated.

This work was supported by a research grant from NIH.

1963 #26

POTENTIAL DIFFERENCE OF THE VENTRICULAR FLUID *in vivo* AND *in vitro* IN THE DOGFISH

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The mechanism of secretion of cerebrospinal fluid (CSF) by the choroid plexus (CP) is unknown and attempts to analyze the mechanism *in vivo* are difficult. The technical advantages of an *in vitro* system led us to explore the CP of the dogfish, S. acanthias. The fourth ventricular CP of this elasmobranch is a 4 x 7 mm sheet which separates ventricular CSF (VF) from the non-neural extradural fluid (EDF) which freely communicates with the general extra-cellular space of the body. This membrane was placed in a Ussing type chamber (aperture, 10 mm^2) and bathed in aerated elasmobranch ringers. The electric potential difference varied from 1-3 mv, with VP positive in all of the experiments. This p.d. was independent of the pH of the Ringers solution and stable for at least 3 hours. The membrane was viable after mounting as evidenced by