

Histochemical Investigations on the Interrenal System of the ~~River~~
Lamprey (Lampetra planeri Bloch)

3 pages
Brook

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(Acta biol. med. germ., Band 24, 553-554 (1970)).

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It was agreed by Giacomini (1;2), Gaskell (3) and Sterba (4) to describe as interrenal cells the cell complexes occurring mainly in the walls of the principal veins and in the pronephric region of lampreys. Sterba (4) also demonstrated a similarity of this cell complex with the cells of the Zona fasciculata of the suprarenal gland of the sucker (i.e. fish?). Chester Jones and Phillips (5) found cortisol and corticosterone in the blood of the sea lamprey (Petromyzon marinus). Molnar and Szabo (6), who could specifically activated a definite cell type in the meso adenohipophysis through the application of the suprarenal cortex inhibitor aldactone on the Transylvanian lamprey (Eudontomyzon danfordi Regan), achieved results which speak for the control of corticosteroid production through the hypophysis.

These hitherto existing data leave open the question as to whether the place of synthesis for corticosteroid is to be seen in the cell complexes described as interrenal cells in cyclostomata. Obviously it could be assumed that histochemical investigations could give further data on this still unsolved problem.

In many larval, metamorphosing and adult Lampetra planeri as well as an adult Petromyzon marinus the pronephric area was particularly studied, as here the strongest concentration of interrenal cells is present. It could be established with Sudan black B and Sudan IV propyl glycol that in the cells under investigation compared with surrounding tissue a very high content of lipids is present. In some there were shown phospholipids (copper-phthalocyaninex), unsaturated lipids (osmium acid-blackening) and acetyl phosphatides (plasmal reaction). Evidence of cholesterol also yielded positive results (Schultz reaction; proof according to Hadler et al. (7)). On the other hand all experiments showed that 5-3-hydroxysteroid-dehydrogenase with dehydroepiandrosterone (3-hydroxy-5-androsten-17-on) as a

substratum produced negative or uncertain results (methods after Levy et al. (8), Galil and Deane (9), Hart (10), Bjersing (11), Wiebe (12)). Also the alcohol -dehydrogenase (method after Hardonk (13)) could not be established histochemically. Evidence of the NADH-tetrazolium-reductase (method after Bjersing (11)) and of the lactate-dehydrogenase (method after Pearse (14)) yielded strongly positive reactions.

With the existing results of the histochemical experiments it turns out quite particularly that in the so-called interrenal cells of Lampetra planeri and Petromyzon marinus the evidence of the 5-3 -hydroxysteroid-dehydrogenase is negative or only uncertain, although in recent years this enzyme, important for the corticosteroid synthesis, has been histochemically demonstrated in the interrenal cells of all the gnathostomata thereupon studied. From this situation the following questions first of all arise:

1. In the so-called interrenal cells of Lampetra planeri and Petromyzon marinus, are the existing volumes of 5-3 -hydroxysteroid-dehydrogenase so minute, that they cannot be further demonstrated by histochemical methods?
2. Have lampreys a method of synthesizing corticosteroids which differs from that of the higher vertebrates?
3. Do the so-called interrenal cells of lampreys in fact correspond to the suprarenal cortical cells of the higher vertebrates?

The answers to these questions must remain in reserve for further investigations. At this point it should unfortunately be shown that the hitherto attained results mean that the so-called interrenal cells of lampreys show a greater similarity with the cells of Corpuscles of Stannius of the bony fish (collection s. (15)) than with the interrenal cells of the higher vertebrates.

Literature

1. GIACOMINI, E.: *Monitore zool. ital.* 13 (1902).
2. GIACOMINI, E.: *Monitore zool. ital.* 15 (1904).
3. GASKELL, J.F.: *J. Physiol., Lond.* 44 59-67 (1912).
4. STERBA, G.: *Zool. Anz.* 155, 151-168 (1955).
5. CHESTER JONES, J. u. J.G. PHILLIPS: *Symp. Zool. Soc. Lond., Nr.1,* 17-32 (1960).
6. MOLNAR, B. u. Zs. SZABO: *Acta biol. hung.* 19, 373-379 (1968).
7. HADLER, W.A., L.M. ZITI, O. DE LUCCA u. A.S. PATELLI: *Acta histochem.* 30, 70-78 (1968).
8. LEVY, H., H.W. DEANE u. B.L. RUBIN: *Endocrinology* 65, 932-943 (1959).

Literature (cont..)

9. GALL, A.K.A. u. H.W. DEANE: J. Reprod. Fert. 11, 333-338 (1966).
10. HART, D. McKAY: Histochemie 6, 17-23 (1966).
11. BJERSING, L. : Histochemie 10, 295-304 (1967).
12. WIEBE, J.P. : Gen. Comp. Endocr. 12, 256-266 (1969).
13. HARDONK, M.J. : Histochemie 5, 234-243 (1965).
14. PEARSE, A.G.E. : Histochemistry, Theoretical and Applied. 2. ed. Churchill, London 1960.
15. KRISHNAMURTHY, V.G. : Gen. comp. Endocr. 11, 92-103 (1968).

Notice

Please note that these translations were produced to assist the scientific staff of the FBA (Freshwater Biological Association) in their research. These translations were done by scientific staff with relevant language skills and not by professional translators.