 Presence and role of steroidal hormones in Styela plicata

Laurenza A. (1)

Dottorato di Ricerca in: processi biologici e biomolecole

(1) Seconda Università di Napoli, Dipartimento di Scienze Giuridiche, Via Mazzocchi, 5 - Palazzo Melzi - 81055 S. M. C. Vetere CE

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Annunziata Laurenza and Lucio Botte
Department of Life Sciences, Faculty of Science, II University of Naples, 43 Vivaldi road, 81100 Caserta (Italy).

Historically, morphological homologies have been used to support a phylogenetic relationship between Hemichordata (Pterobranchia and Enteropneusta) with Echinodermata and Chordata.

In my PHD I have examined the functional morphology between neural gland complex, endostyle and ovary in the Ascidian's Styela plicata by means of immunohistochemical techniques.

The morphostructural, cytochemical and immunocytochemical evidence displayed in this thesis confirm, in agreement with previous findings showing, that the endostyle is homologous to the follicle of the thyroid gland of Vertebrate. Moreover, this thesis provides also in Styela plicata, hormonal evidence of a partial imitation of the hypothalamus-hypophysis-thyroid-ovary of Vertebrate axis can be observed.

The choice of material (neural complex and endostyle) for the investigation in Styela plicata was inspired by the systematic position occupied by the association of Stolidobranchiati in relation to the development of branchial structures and by presence in the nervous system in these animals of numerous substances like hormones in any ascidians. In particular, in the family of Styelidae, the wall of the branchial basket is equipped with numerous plicatoure, leading to a significant increase in the contact surface with water. A development of this area is an improvement of both the efficiency of gaseous exchange and also is a catch particles of food.

There is much evidence showing that the complex neural influence on the release of gametes during sexual maturity of Ciona intestinalis was also shown biochemically (Di fiore et al). This suggests a functional relationship between the two structures in the ascidian class, similarly to what happens in Vertebrates; pituitary-thyroid. The hypothesis of this feedback mechanism comes from in immunohistochemical investigations which showed that in the spawning period of the same tissue components also of TRH together of TSH, T4 and GnRH, FSH and LH and this suggests that these different hormones work together for a regulatory mechanism similar to that known in Vertebrates involving the neural complex and in the endostyle and influence on oovotestis's activity.