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Glandular Cells in Sea Star Lymphoïd Organ: Axial Organ Tem Observations

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ABSTRACT

We recall, in this work, the presence of an epithelio-neural system in the sea star axial organ and a glandular one. Many vesicles (from 100 to 500 angstroms) with a more or less opaque content in electron microscopy, appear in these last cells.

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Introduction

Recently, we have described à primitive nervous system in the sea star (Asterid, Echinodermata): Asterina gibbosa [1]. It belongs to an epithelio-neural system and seems to be constituted of synaptic-type vesicles: à 100 to 500 A (angströms) vesicles in diameter. Another type of vesicles seems also to be characteristic of glandular cells we study now in transmission electron microscopy.

Materials and Methods Animals

Sea stars Asterina gibbosa (Pennant) were purchased from the laboratory of Roscoff (France): they came from the Channel sea

TEM Methods

Asterina gibbosa were sacrified at time t=0

Axial organ (AO) were excised from sea stars.

AO were fixed in glutaraldehyd (1,5% in cacodylate buffer) then rinsed in buffer alone.

A post -fixation in Osmium tetroxyd (Os O4) at 2% in distilled water was realized.

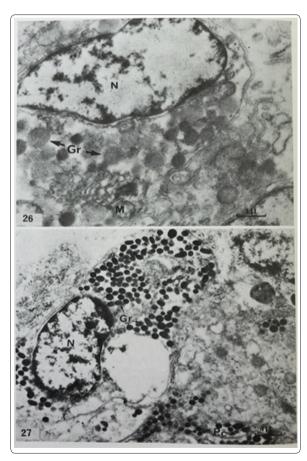
Then Dehydratation was performed (from alcohol 70° to 100°) followed by a «Pre-Inclusion».

At last Inclusion in Epon was done. Cuts with à LKB ultrotome and finally observations with a Hitachi Microscope were realized at room temperature.

Results

The Figure 26 shows, besides the nucleus (N), in the hyaloplasm, many vesicles of 300 Angstroms in diameter, which are associated to mitochondriae (M) and Golgi apparatus (G). It evokes typically a «Glandular cell». We note the clear content in electron microscopy of these vesicles.

As for Figure 27, vesicles have more opaque content in microscopy than in Figure 26. They are also more little in diameter than those precedently described (about 100 Angstroms). The cell which contains such vesicles resembles to a «Glial cell» [2].



Discussion Conclusion

In precedent works (Leclerc 1970, Leclerc and Delavault 1971) [3,4] we have described some synaptic vesicles in the coelomic membran and in the same manner at the level of the various sinus. It corresponds to sea star nervous system. We have described also larger vesicles belonging to glio-interstitial system. They resemble

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to those observed in Figure 27: it is spoken of glial cell. At last we mention a last type of « neuro-glandular » vesicles. (Figure 26) or « glandular » vesicles. Undoubtly a glandular system exists in the sea star axial organ with typical cells. The sea star lymphoïd organ is a sophisticated organ which contains lymphocytes, glandular cells and nervous cells besides muscular fibers. It constitutes a model of Adaptative Immunity in Invertebrates [5].

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