New Cytokine Genes In An Invertebrate: Thromboxane Ones In Echinodermata

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Abstract

Two main points assert the existence of platelets in Echinodermata (Invertebrates)
- The evidence of thromboxane genes in an ophuirid, Ophiocomina nigra.
- The appearance of T.E.M platelets, in the asterid, Asterias rubens Ophuirids and asterids possess an IGKAPPA gene each.

Introduction

The appearance of platelets, in Asterias rubens was just described [1], (Figure 1): They resemble blood platelets of vertebrates. The aim of this work is to look for genes implicated in the initiation and synthesis of thromboxane (Thromboxane A synthetase gene, Thromboxane A2 receptor gene) in another Echinodermata : Ophiocomina nigra (ophuirids). Thromboxane in vertebrates is a cytokine, regulated by immune system ones.

Materials and Methods

Ophiocomina nigra was purchased by the Laboratory of Roscoff (France). Digestive coeca were excised.

- Ophiocomina nigra and its preparation to obtain mRNA have already been described [2]. Furthermore quality controls were made.
- Sequencing: Transcriptome was assembled from RNA-Seq fastq files using Trinity v2.1.1 [3] with default parameters. A Blast database was created with the assembled transcripts using makeblastdb application from ncbi-blast+ (v2.2.31+). The sequences of transcripts of interest were then blasted against this database using blastn application from ncbi-blast+ [4] with parameter word_size 7.

On the other hand, a Table 1 summarizes the genomic results.

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Table 1: TBXA2R represents the human thromboxane A2 receptor gene, TBXAS1 the human synthetase one.

Figure 1: we observe a sea star Asterias rubens platelet in T.E.M [1].
Discussion and Conclusion

Thromboxane A2 gene, we found in ophuirids (Echinodermata) induces a cytokine in human [5]. Thromboxane A2 produced by activated platelets, has prothrombotic properties. It stimulates activation of new platelets as well as increases platelet aggregation [5]. Genomic results assert the evidence of a new cytokine in invertebrate: the thromboxane. Furthermore T.E.M results [1], (Figure 1) show structures which resemble blood platelets. In conclusion, it was clearly shown that platelets and thromboxane cytokine exist in Echinodermata.

References


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