

Immune genes in echinodermata: asterids, ophuirids, crinoïds. Comparisons with echinids, holothurids

Abstract

We compare in the present report the found immune genes in the fifth classes of Echinodermata the Echinids, the Asterids, the Ophuirids, the Crinoïds, and the Holothurids. 3 classes show the existence of an IG Kappa gene, a Fc receptor gene a Fab gene. This phenomenon seems linked to the existence, in them, of an axial organ which is considered, in Asterids, as an ancestral lymphoïd organ.

Keywords: Invertebrates, Echinodermata, axial organ, IG Kappagene, primitive antibody

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Introduction

Recent data news concerns the existence or no-existence of an Invertebrate primitive antibody. They suggest that Echinodermata are the only Invertebrates to possess this last one. In fact we have found in them an Iggkappa gene, a Fab gene, a Fc receptor gene, a Cr receptor gene.¹⁻³ These discoveries were correlated to the presence of the well-known axial organ which is an ancestral lymphoïd organ, it is situated in the coelomic cavity of Echinodermata near the stone canal against it lies.⁴

Material and methods

animals : *Asterias rubens* (Asterids), *Ophiocomina nigra* (Ophuirids), *Antedon bifida* (Crinoïds)

were used They were collected in different marine laboratories:

Roscoff (France), Gothenburg (Sweden)

genomic methods Obtention of crinoïd mRNA Digestive coeca were excised from the *Asterias rubens* body second from *Ophiocomina nigra* body and third from the *Antedon bifida* body, mRNA was obtained from Uptizol (Interchim). Quality controls were operated, Sequencing Sequencing was made on Illumina Next Seq 500 with paired end : 2.75 bp, Transcriptome was assembled from RNA-Seq fastq files using Trinity v2.1.1 with default parameters. A blast database was created with the assembled transcripts using make blast db 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+ ,with parameter word_size.⁵⁻⁶

Result

Results are summarized in the following table 1.

Table 1 TEM results concerning sea star lymphocytes(T-like and B-like cells) and nd significates not determined

	Igkappa gene	IgKappa gene	Fab	Fc receptor gene	Cr receptor gene	Axial organ	Plasmocytic cells
<i>Asterias rubens</i>		+	+	+	+	+	+
Asterids							
<i>Ophiocomina nigra</i>		+	+	+	nd	+	+
Ophuirids							
<i>Antedon nigra</i>		+	nd	+	nd	+	nd
Crinoïds							
Echinids		-	-	-	-	+	-
Holothurids		-	-	-	-	-	nd

Discussion

It is said there are lymphocytes in Invertebrates, small ones (4µ in diameter) yes, but true lymphocytes. We call them in Asterids, B-like

ones and T-like ones or sea star lymphocytes, Furthermore Genomic studies assert the evidences of IG Kappa genes in Echinodermata, In Asterids, Ophuirids and Crinoïds, at our knowledge, Echinids would just present Innate Immunity (Figure 1 & Figure 2).

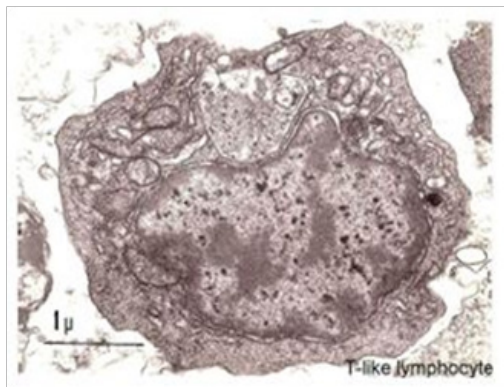


Figure 1 T-like lymphocyte

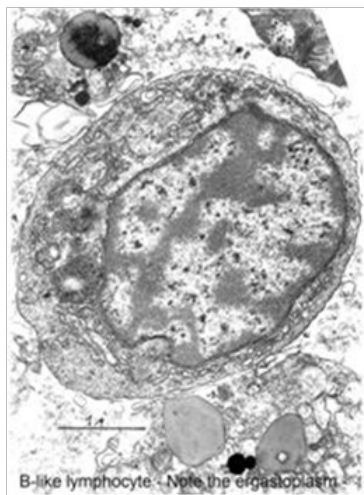


Figure 2 B-like lymphocyte, note the ergatoplasm

Conclusion

As for Holothurids, further studies are necessary to indicate the field of Innate Immunity and may be adaptative immunity in them.

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None.

Conflicts of interest

The author declares that there are no conflicts of interest.

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