



Evidence of Complement Receptor Genes in Invertebrates (Echinodermata)

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Abstract

Recently CR receptor gene was discovered in the Asterid : *Asterias rubens* (Echinodermata). Other Echinodermata show in their genomes the CR2 gene (CR2 Complement C3d receptor 2) i-e Ophuirids (*Ophiocomina nigra*) and Crinoïds (*Antedon bifida*)The sequences of their transcriptomes are presented.

Keywords: Receptor; Echinodermata

Introduction

Recently, CR receptor gene was discovered in an Invertebrate : the sea star *Asterias rubens* (Asterids, Echinodermata) [1]. It seems clear tous, to look for such genes in other Echinodermata: *Ophiocomina nigra* (Ophuirids), *Antedon bifida* (Crinoïds) which possess, in their genomes, the well-known IGKappa gene (corresponding to the Invertebrate Primitive Antibody [2,3].

The Complement C3b/C4b receptor 1 like and the CR2 Complement C3d receptor 2 genes were studied in *O. nigra* and *A. bifida* genomes

Materials and Methods

- **Animals:** *Ophiocomina nigra*, *Antedon bifida* were purchased from the Marine Laboratory of Roscoff(France)
- Obtention of ophuirid and crinoïd mRNA :Digestive coeca were excised from the animal's bodies. *O. nigra*, *A. bifida* mRNA were obtained from Uptizol (Interchim). Quality control 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 [4] 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+ [5] with parameter word_size 7.

Résultats and Discussion

We just find, in *Ophiocomina nigra* and *Antedon bifida* CR2 complement C3d receptor 2 gene.Complement C3b/C4 b receptor 1 like gene is not present significantly.

First we present the characteristics of CR2 transcriptome in *Antedon bifida* (Table)

The sequence one is following

>TRINITY_DN16054_c3_g1_i1 (CR2)

```
5GTCCACTATTAATTTGTTACAAAACACTAATTACGAATGTCAA-  
CAAGTCGGATATCATTT
```

```
ATTTTCTACTAAACTGAAATACTTTACTTTCAGTCTAGATAGCCTA-  
AACCCAAACTCGAT
```

```
TCAACATTTAATATTTTTAGAGATTAATATAATCTCAGATGAAG-  
TAGTAAACTAGTAAAC
```

```
ATTTAAAAATAAGCGCAAAGTGAAACTTCTATTATAG-  
GAATATTCAGTAATCATACCTTC
```

```
AAAAAATTAATCATGTATCATAAAGTTATTGGTACTGTAATG-  
CAAGTAGAATAGTAATAG
```

```
ATAAGAAGTCTTCCATTGGCAACCACTGCTTTTAAATAGATTT-  
TATTGTAAATAAAAAAT
```

```
ACTAAAGCAAAAAAAAAAAAAAAAAAAAAACAGAA3'
```

QueryID	Query name	Subject ID	Identity (%)	Length	Mismatch	Gapopen	Query cover (%)	E-value	Bitscore
NM_001006658.2	CR2	TRINITY_DN16054_c3_g1_i1	83,33	48	4	3	1,00	2,80E-02	41,70

We repertoriare the *Ophiocomina nigra* CR2 transcriptome sequence to compare

>TRINITY_DN65134_c0_g1_i1 (CR2)

5AAAACAGGCAAAAATGCTCTTTAGGAAAACACAAACGCGTCTC-CGGACTCTCCGCGTGTCT

CTGCATGTGCATCTGCATTGTA ACTCTGTATTACACA-CAAAAAAATATGCGAGTGTATT

TGCGAGTTGATCACGCATATGCCTACATGAGTTAGGTGGATAATT-GAAAGCTCCACATGG

AAAAAATTACGATACAGGAAGGTA AAAATTGTA AAAAAAATA-ATATCAAAAAAAAAAAAAA

AAAAAAAAAGACCACTCAAAACCAAGACAGAATGACGAAGAC-CACA3'

Conclusion

Blasts against human were performed. They lead us to envisage as highly true the evidence of CR and CR2 genes in Invertebrates (Echinodermata).

CR2 gene, in human, encodes a membrane protein which function as a receptor for Epstein-Barr virus binding on B and T lymphocytes. Echinodermata lymphocytes exist, do they possess such a receptor? That is the question! Further studies are necessary to clarify this problem.

When we compare the sequences of CR2 *Antedon bifida* and *Ophiocomina nigra* transcriptomes we observe slight differences in 5'-3', between them. They are due to alignment's differences. Nevertheless, it is obvious, that CR2 gene is present in these two Echinodermata.

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