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Evidence of IRF5 Gene in Invertebrates: the Echinodermata

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Abstract

Recently evidence of IRF2, IRF4, IRF8 genes were whown in Echinodermata. Other" interferon" genes were looked for such as: IRF3, IRF5, IRF7 ones in Ophuirids and Crinoïds.

To day it can be said IRF5 gene exists in Ophiocomina nigra (Ophuirid, Echinodermata) and Antedon bifida (Crinoïd, Echinodermata).

Keywords: *Invertebrates; Echinodermata; IRF5 gene*

Introduction

Since we discovered Igkappa gene (IPA: invertebrate primitive antibody) in 3 classes of Echinodermata out of 5 (Ref.1), many other immune genes were revealed in them, such as IRF2 , IRF4, IRF8 genes (Ref.2).

The aim of this work is to look for IRF3, IRF5, IRF7 genes in Ophiocomina nigra(Ophuirids) and Antedon bifida (Crinoïds) 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 (Ref.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+ (Ref.4) with parameter word_size 7.

Results

A table recapitulates the characteristics of the found IRF5 transcriptome in Antedon bifida:

QueryID	Query name	SubjectID	Identity (%)	Length	Mismatch	Gapopen	Query cover (%)	E-value	Bitscore
NM_001098629.3	IRF5	TRINITY_DN11319_c1_g1_i1	85,71	42	4	2	1,00	5,00E-03	43,60

The Sequence of the Transcript is Now Following

>TRINITY_DN11319_c1_g1_i1 (IRF5)

5'GTGCAACAAGTACCTCTAATAGTAATAACACTAAAAACAAAGAAAGAACAATTGTACTAGAAGATGGCGATGATGATTCAGAAGATGAGGAAGACTATGATGCTGAAAAAGATGAGGAAGATGATGAGGAGGAGGAGGAGGATGAAGAAGAAGAAGTTGAAGAGGATGCAGACACTGAGGATGCTGGTGATGATACGGAGGACTACGGGTTTCCAGGAAGAGAGGAGCCTGGTAGTGACAGTGGATGTACAGCAGTAGTAGCCATTCTAAAG 3'

The Sequence of the IRF5 Transcriptome in Ophiocomina Nigra Corresponds to

TRINITY_DN54299_c0_g1_i1 (IRF5)

5'AAAAAAAAAAAAAAATATGTAGGGTGAGTTAATATGATGTAAACTCGCCAATATATTCTGGTACCAATCTCAAGCCATCTAATATTATATAAGCATGGACAATTATCTTGGTTTTAATGTCCTTTTTGAAATTGAACAGAGGGGCAGCCTTGATATGTATTCCCGAATTAAAAACCGACGCATTGCTCAGCAGGAAGAAACCCAAGATGGGGATGACAATGAGGAGGAAGAAGAGGAAGATGATTCAGAGGAGGACTCGGATGAGGATTCTAGTGATGATGACACATCATCTGAAGAAGAGAGTTCTGAAGAGGAACCCGGCAGAA 3'

We mention that IRF3 and IRF7 genes are not found in O.nigra, in A.bifida genomes.

Discussion Conclusion

This work constitutes a brief report on the true existence of an interferon gene in invertebrates.

In human this gene (IRF5) is implicated in the regulation of the immune system.

IRF5 gene is also present in Echinodermata, in the same manner of IRF2, IRF4, IRF8 genes. It's the first time they are described in Invertebrates. From a point of view of genomic evolution, it remains enigmatic but it is.

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