

# Evidence of IRF5 Gene Besides IRF2, IRF4, and IRF8 genes in Invertebrates: The *Echinodermata*

Michel Leclerc

Orleans University, Orleans-La Source, France

## ABSTRACT

Recently, evidence of IRF2, IRF4, and IRF8 genes was shown in *Echinodermata*. Other “interferon” genes were looked for such as IRF3, IRF5, and IRF7 ones in Ophuirids and Crinoïds. Obviously, it can be said IRF5 gene exists in *Ophiocomina nigra* (Ophuirid, and *Echinodermata*) and *Antedon bifida* (Crinoïd, and *Echinodermata*).

**Key words:** Echinodermata, invertebrates, IRF2, IRF4, IRF5 gene, IRF8 genes

## INTRODUCTION

Since we discovered I $\kappa$  gene (invertebrate primitive antibody) in three classes of *Echinodermata* out of 5,<sup>[1]</sup> many other immune genes were revealed in them, such as IRF2, IRF4, and IRF8 genes.<sup>[2]</sup>

The aim of this work is to look for IRF3, IRF5, and IRF7 genes in *Ophiocomina nigra* (Ophuirids) and *Antedon bifida* (Crinoïds) genomes.

## MATERIALS AND METHODS

- Animals: *O. nigra* and *A. bifida* were purchased from the Marine Laboratory of Roscoff (France)
- Obtention of ophuirid and crinoïd mRNA: Digestive caeca were excised from the animal's bodies *O. nigra*, and *A. bifida* mRNA were obtained from Uptizol (Interchim). Quality control was operated
- Sequencing: Sequencing was made on Illumina NextSeq 500 with paired-end: 2.75 bp.

Transcriptome was assembled from RNA-Seq fastq files using Trinity v2.1.1<sup>[3]</sup> 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+<sup>[4]</sup> with parameter word\_size 7.

## RESULTS

A Table 1 recapitulates the characteristics of the found IRF5 transcriptome in *A. bifida*:

The sequence of the transcript is now following:

>TRINITY\_DN11319\_c1\_g1\_i1 (IRF5)

5'GTGCAACAAGTACCTCTAATAGTAATAACACTAAA  
AACAAAGAAAGAACAATTGTACTAG

AAGATGGCGATGATGATGATTCAGAAGATGAGGAA  
GACTATGATGCTGAAAAAGATGAGG

AAGATGATGAGGAGGAGGAGGAGGATGAAGAAGA  
AGAAGTTGAAGAGGATGCAGACACTG

AGGATGCTGGTGATGATACGGAGGACTACGGGTTT  
CCAGGAAGAGAGGAGCCTGGTAGTG

ACAGTGGATGTACAGCAGTAGTAGCCATTCTAAAG 3'.

The sequence of the IRF5 transcriptome in *O. nigra* corresponds to:

### Address for correspondence:

Michel Leclerc, Orleans University, Orleans-La Source, France. E-mail: mleclerc45@gmail.com

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Table 1: IRF5 gene

| QueryID        | Query name | Subject ID               | Identity (%) | Length | Mismatch | Gapopen | Query cover (%) | E-value  | Bit score |
|----------------|------------|--------------------------|--------------|--------|----------|---------|-----------------|----------|-----------|
| NM_001098629.3 | IRF5       | TRINITY_DN11319_c1_g1_i1 | 85.71        | 42     | 4        | 2       | 1.00            | 5.00E-03 | 43.60     |

TRINITY\_DN54299\_c0\_g1\_i1 (IRF5)

5'AAAAAAAAAAAAAAAAATATGTAGGGTGAGTTA ATA  
TGATGTAAACTCGCC AATATATTCTG

GTACCAATCTCAAGCCATCTAATATTATATAAGCATG  
G ACAATTATCTTGGTTTTAATGT

CCTTTTTGAAATTGAACAGAGGGGCAGCCTTGATA  
TGTATTCCCGAATTA AAAACCGACG

CATTGCTCAGCAGGAAGAAACCCAAGATGGGGATG  
ACAATGAGGAGGAAGAAGAGGAAGA

TGATTGAGGAGGACTCGGATGAGGATTCTAGT  
GATGATGACACATCATCT GAAGAAGA

GAGTTCTGAAGA GGAACCCGCGAGAA 3' We mention  
that IRF3 and IRF7 genes are not found in *O. nigra*, in  
*A. bifida* genomes.

## DISCUSSION AND 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, and IRF8 genes. It is the first time they are described in invertebrates. From a point of view of genomic evolution, it remains enigmatic, but it is.

## REFERENCES

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