Evidence of *Il2* and *Il6* Genes in the Crinoïd: *Antedon bifida* (Echinodermata)

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For the first time, in 1984, the concept of lymphokine-like substances was evoked in an Echinodermata: the sea star *Asterias rubens* (1). Later, in 1996, it was spoken of interleukin (*Il2*, *Il4*, and *Il6* in the same animal (2)). Immunogenomics contributed to determine evidence of the presence of *Il2* (3) and *Il4* genes in Echinodermata but not of *Il6* gene.

The aim of this work, was the research of this last one, in an ancestral Echinodermata: the *Antedon bifida* which belongs to the class of Crinoïds. *Antedon bifida* was obtained at the station of Biologie Marine of Roscoff, France. Digestive coeca were excised from the A. bifida body. mRNA was obtained from Uptizol (Interchim, France), and quality control was operated. 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-blastdb 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.

Table 1 summarizes the obtained results with sea star *Il2* and *Il6* transcriptomes, when compared to Homo sapiens and *Mus musculus* ones. Figure 1 shows the corresponding sequences in 5’-3’ direction.

Although *Il2* gene appears like something well-known in Echinodermata, *Il6* gene evidence was not yet related in invertebrates. Beck and Habicht spoke of *Il6*-like protein in 1996 in invertebrates (6). So it is the first time that *Il6* gene is found in invertebrates. Our work in *Antedon bifida*, a Crinoïd, an ancestral Echinodermata shows that in

<table>
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<th>Query ID</th>
<th>Symbol</th>
<th>Species</th>
<th>Transcript ID</th>
<th>Identity (%)</th>
<th>Length</th>
<th>Mismatch</th>
<th>Gapopen</th>
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<td>0</td>
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<td>5.00E-08</td>
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<td>NM_001314054.1</td>
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<td><em>Mus musculus</em></td>
<td>TRINITY_DN19147_c3_g2_i1</td>
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<td>25</td>
<td>0</td>
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an original way.

In summary cytokine genes such as *Il1*, *Il2*, *Il4*, *Il6* exist in invertebrates. The present finding highlights the novelty of our work.

**Conflict of interest**

The authors declared no conflict of interest.

**References**