

Evidence of PECAM1 Gene in Invertebrates: The *Echinodermata*

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ABSTRACT

PECAM1 gene we met usually in human was discovered for the 1st time in invertebrates, in *Echinodermata*. Its parameters, its sequence in 5'-3' was clearly demonstrated in *Ophiocomina nigra* (Ophuirids) and in *Antedon bifida* (Crinoids).

Key words: *Echinodermata*, invertebrates, PECAM1 gene

INTRODUCTION

PECAM1 gene is a typical one we met usually invertebrates. The protein encoded by this gene is found on the surface of platelets, monocytes, neutrophils, and some types of T cells that are to say: Cells showing the “antigen.” PECAM1 gene is a member of the immunoglobulin superfamily.

Since we discovered invertebrate primitive antibody^[1,2] and invertebrate lymphocytes in *Echinodermata*, we decide to look for genes and cells which are implicated in showing the “antigen.”

- It is why we tried to discover in *Echinodermata* PECAM1 gene
- Ophuirid and crinoïd genomes were studied.

MATERIALS AND METHODS

Animals

Ophiocomina nigra (Ophuirid) and *Antedon bifida* (Crinoïd) were obtained at the station “Of Biologie Marine of Roscoff” France.

Obtention of ophuirid and crinoïd mRNA

Digestive coeca were excised from their bodies and mRNA was obtained from uptizol (interchim), then quality controls were operated.

Sequencing

Sequencing was made on Illumina NextSeq 500 with paired-end: 2. 75 bp.

The transcriptome was assembled from RNA-Seq FASTQ files using Trinity v2.1.1^[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+^[4] with parameter word_size 7.

RESULTS

Two tables [Tables 1 and 2] summarize the obtained results in the first *O. nigra* (Ophuirid genome) and second in *A. bifida* (Crinoïd):

The sequence of PECAM1 transcriptome in 5'-3' in ophiocomina genome is the following:

- 5' ATATATCATATATGATATAGTACCTTTGTTATATA TCATAATACATATAAATGTGTATTA
- TGTTATCTATAATTATATAATTTTCATATATAAGATG TATAATATGTATCATATATTATAT
- ATGTTATGTAATATATATAGTATATATAA GATGACACAGGATAAATATTATATACTATGA
- CATATAAAATATATGAGGTTATATGTTACATAT AAGGCATAGCACATAACATGTAATATA

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Table 1: *Ophiocomina nigra*

Query ID	Query name	Subject ID	Identity (%)	Length	Mismatch	Gap open	Query cover (%)	E-value	Bit-score
NM_000442.5	PECAM1	TRINITY_DN38594_c0_g1_i1	75,72	173	25	8	5,00	5,00E-11	71,30

Table 2: *Antedon bifida*

Query ID	Query name	Subject ID	Identity (%)	Length	Mismatch	Gap open	Query cover (%)	E-value	Bit-score
NM_000442.5	PECAM1	TRINITY_DN19334_c8_g2_i1	82,50	280	37	4	12,00	2,00E-60	235,00

- TATCATATATAATTTTTTTTTAGACAGAATCTTG TCCTGTTGCACAGGGTGGGGTACAAT
- GGCGCCATCTTTGCTCACTGCAACTTCTGCCT CACGGGTCCAAGCGATTGTCCTCCCTCA
- GCCTCCAGGTAGCTGGGACTACACCACAC TGGGACTACACCAGCTGCCACCATGCCTAG
- CTAATTTTTGTATTTTTGGTAGAGACAGGGTT TTGCCGTGTTGCCAGGCTGGTAGATCG
- G3’.

CONCLUSION

For the first time, evidence of the PECAM1 gene in *Echinodermata*, so in invertebrates, is given. We work, in the same manner with other particular human genes to demonstrate, *Echinodermata* are better evolved than other invertebrate phyla and further genomic studies concerning human and *Echinodermata* gene comparisons are coming, especially in cells “showing the antigen.”

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