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CRP Gene in an Invertebrate: Ophiocomina Nigra (Echinodermata)

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ABSTRACT

Recently, we had discovered thromboxane genes and platelets by the use of T.E.M in an INVERTEBRATE: Ophiocomina nigra (Echinodermata).

We find today C reactive protein (CRP) gene always in this invertebrate.

INTRODUCTION

The inflammatory C-reactive protein (CRP) promotes thrombosis after vascular injury presumably via potentiation of thromboxane activity.

The acute phase response (APR) is an early INNATE immune function which is initiated by inflammatory signals and CRP gene.

The CRP gene has been found in ALL VERTEBRATES and FISH : the Salmon (Ref.1) and other teleost species such as rainbow trout, arctic char and goldfish but NEVER in INVERTEBRATES.

Thromboxane genes were discovered in INVERTEBRATES and particularly in the Echinodermata : Ophiocomina nigra (Ref.2).

The aim of this paper is to look for CRP gene in the Ophiocomina nigra genome.

MATERIALS AND METHODS

a) Animals

Ophiocomina nigra was purchased from the Marine Laboratory of Roscoff(France)

b) Obtention of Ophuirid mRNA

Digestive coeca were excised from the O.nigra body. O.nigra mRNA was obtained from Uptizol (Interchim). Quality control were operated.

c) 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

The characteristics of the transcriptome CRP , then the sequence in 5'-3' appear just under the high significant e-value (9,00 E-84) and the Bitscore (311,00) :

QueryID	Query Name	SubjectID	Identity (%)	Length	Mismatch	Gapopen	Query cover (%)	E-value	Bitscore
NM_000567.3	CRP	TRINITY_DN2742_c0_g1_i1	75,17	721	148	25	37,00	9,00 E-84	311,00

>TRINITY_DN2742_c0_g1_i1

5'GGACTTCTTGCCCTTGATCTTTCAGACA
GAGCTCTGTCCTCTTAGTCCGGATCCCAG
CAG
AGTCGACAGCCATGGAGAAGCTACTATG
GTGTCTTCTGATCACGATAAGCTTCTCTC
AGG
CTTTTGGTCATGAAGACATGTCTAAACAG
GCCTTCGTATTTCCCGGAGTGTCAGCTAC
TG
CCTATGTGTCCCTGGAAGCAGAGTCAAA
GAAGCCACTGGAAGCCTTCACTGTGTGT
CTCT
ATGCCCACGCTGATGTGAGCCGAAGCTT
CAGCATCTTCTCTTACGCTACCAAGACGA
GCT
TTAACGAGATTCTTCTGTTTTGGACTAGG
GGTCAAGGGTTTAGTATTGCAGTAGGTGG

GC
CTGAAATACTGTTCAGTGCTTCAGAAATT
CCTGAGGTACCAACACACATCTGTGCCA
CCT
GGGAGTCTGCTACAGGAATTGTAGAGCT
TTGGCTTGACGGGAAACCCAGGGTGCGG
AAAA
GTCTGCAGAAGGGCTACATTGTGGGGAC
AAATGCAAGCATCATCTTGGGGCAGGAG
CAGG
ACTCGTATGGCGGTGGCTTTGACGCGAAT
CAGTCTTTGGTGGGAGACATTGGAGATG
TGA
ACATGTGGGACTTTGTGCTATCTCCAGAA
CAGATCAATGCAGTCTATGTTGGTAGGGT
AT
TCAGCCCCAATGTTTTGAACTGGCGGGC
ACTGAAGTATGAAACACACGGTGATGTG
TTTA
TCAAGCCGCAGCTGTGGCCCTTGACTGA
CTGTTGTGAGTCCTGAGGCACCTCCTGG
GATT
ACATTCTCTCCCTTGTCCCTCCTTATGAAC
CTTTTAACCCCAGCAGATGTTGTAGATCT
G
TTTTGTGAATATGGCCTTTCACTTCTCTGC
TCTGTGGTCCTCAGCACTAGAGCATGGAA
T
TTAAATGTAAGGCTTCCAGCATGTGCATC
CCACTACTCTTTATCAAAGAGAACCTGAC
TT
ACCCACGGTGTGTGTATGTGTATTTAATTA
AAAAATTTTTAGACATAATCCTTCTCCCTC
ACACAGATGAGAAACCAGATGCACAGAA
AGGAGAATAATTTTTTATTGTTTTTGTTTC
AG
AATGTCATATTGAATGGTGTACTTATATCC
TTTCTATCCCTCCCTCTTCAAATCCTCTAC
TATCCCCCCCAATTCTCCCTCGAATTCATG
ATGTCTTATAATTAGCCTTATATGCACATA
CACATCTATCTATCTATCTATCTATCTATCT
ATCTATCTATCTATCTATCTATC**3'**

Conclusion and Discussion

It is obvious CRP gene exists in the Ophiocomina nigra genome : all the characteristics of the transcriptome described in this paper are highly significant.

It will in the future be of major interest to explore the interactions between the CRP gene and the Thromboxane ones in this invertebrate.

Anyway, we observe again the presence of genes in Echinodermata which had, till now, never been shown, in an Invertebrate.

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