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Evidence of Fab Fragment Gene in the Ophuirid : Ophiocomina Nigra (Echinodermata)

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Abstract

Recently, Fab fragment gene was discovered in the Asterid genome (Asterias rubens genome).More recently was found the Fab fragment gene in the Ophiocomina nigra genome with an e-value of 3,00E-12 and 89,38 identity (Homo sapiens/o.nigra).This discovery corroborates the presence of a primitive antibody in Ophuirids.

Keywords: Invertebrate, Ophuirids, Ophiocomina Nigra, Fab Fragment Gene, Primitive Antibody

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Introduction

The purpose of this paper is to draw attention to the emergence of primitive antibody [Ref. 1, 2] in two classes of Echinodermata :

The Asterids and the Ophuirids.

In the sea star primitive antibody, the presence of Fab fragment gene occured [Ref.3]

The aim of this communication is to look for Fab fragment gene in the genome of Ophiocomina nigra.

Materials and Methods

Ophiocomina nigra was otained from the Biology Station of Roscoff.

a) Ophiocomina nigra and its preparation to obtain mRNA have already been described [Ref. 2].Furthermore quality controls were made.

b) It is useful to add that :

Transcriptome was assembled from RNA-Seq fastq files using Trinity v2.1.1 [Ref.4] 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 .5) with parameter word_size 7.

Results :

The transcriptome presents the sequence of Fab fragment gene(e-value:3,00E-12)

>NM_133273.3 FCAR (2204) Fab fragment / Homo sapiens Fc fragment of IgA receptor (FCAR), transcript variant 5, mRNA
5′TCCACCCAAGAGCAACCTGGAACTAAGTTATTCGGCAACGAACTGTTCCACTTTGTTGTGAGGCAATAGA
TGTGGAAATTCCCTGACGAGGGGCTCTGTCCTCATACTTCCTGCGGAGCTTATTGTCGTAAGAATATCTG
TCATCCTGCTAATGTGCATTGAAAGGAGAGCAACGGGGCTGAGGCCGTGTCAGCACGATGGACCCCAAAC
AGACCACCCTCCTGTGTCTTGGGGACTTTCCCATGCCTTTCATATCTGCCAAATCGAGTCCTGTGATTCC
CTTGGATGGATCTGTGAAAATCCAGTGCCAGGCCATTCGTGAAGCTTACCTGACCCAGCTGATGATCATA
AAAAACTCCACGTACCGAGAGATAGGCAGAAGACTGAAGTTTTGGAATGAGACTGATCCTGAGTTCGTCA
TTGACCACATGGACGCAAACAAGGCAGGGCGCTATCAGTGCCAATATAGGATAGGGCACTACAGGTTCCG
GTACAGTGACACCCTGGAGCTGGTAGTGACAGACTCCATCCACCAAGATTACACGACGCAGAACTTGATC
CGCATGGCCGTGGCAGGACTGGTCCTCGTGGCTCTCTTGGCCATACTGGTTGAAAATTGGCACAGCCATA
CGGCACTGAACAAGGAAGCCTCGGCAGATGTGGCTGAACCGAGCTGGAGCCAACAGATGTGTCAGCCAGG
ATTGACCTTTGCACGAACACCAAGTGTCTGCAAGTAAACACCTGGAGGTGAAGGCAGAGAGGAGCCAGGA
CTGTGGAGTCCGACAAAGCTACTTGAAGGACACAAGAGAGAAAAGCTCACTAAGAAGCTTGAATCTACTT
TTTTTTTTTTTGAGACAGAGTCTGGCTCTGTCACCCAGGCTGGAGTGCAGTGGAGCAATCTCGGCTCAT
TGAACCTCTTGGGTTCAAGTGATTCTTGTGCCTCAGCCTCCCAAGTAGCTGGAATTACAGGCACATACCA
CTGCACCCAGCTAATTTTTGTATTTTTAGTAGAGATGGGGTTTCACTGTGTTGGCCAGGCTGGTCTCGAA
CTCCTGACCTCAGGTGATCCACCCACCTTGGCCTCCCAAAGTGCTGAGATTATAGGCATGAGCCACCACG
CCTGGCCAGATGCATGTTCAAACCAATCAAATGGTGTTTTCTTATGCAGGACTGATCGATTTGCACCCAC
CTTTCTGCACATAAGTTATGGTTTTCCATCTTATCTGTCTTCTGATTTTTTATATCCTGTTTAATTTCTT
CCTTCATTGTTCTTCTCTTTTTTTATTTATTTTATTTATTTTTATTTTTATTTTTATTTGAGACAGAGTC
TCACTCTGTTGCCCAGGCTGGAGTGCAGTGGCACGATCTCGGCTCACTGCAACCTCTGCCTCCTGGGTTC
AAGTGATTCTCCTGCCTCGGCCTCCCAAGTAGCTGGGATTGCAGGCTCCCACCATCACGCCCAGCTACTT
TTACAGTATTTTTAGTAGAGACGGGGTTTCATCACATTGGCCAAGCTGGTCTCAAACTTCTGACCTCGTG
ATCTGCCCGCCTCGGCCTCCCAAAGTGCTGGGATTACAGATGTGAGCCACTGCGCCCAGCCTTCTTTTTA
TATTTTTAAATGTGTCTTCCCCAAATATAAATGGTTGGTAAGCATGCCAAATATATTCAATAACCCCCCT
CCTTTATTTTTTTTTGTTGAAGTGAGGCTCTCCCTATGTTGCCTAAGCTGGTCTTGAACTCCTGGTCTCA
AGCAATCCTCCTACCTCAGCCTCCTGCTGTGTTCATCTACAAATTGATAAGAGTGAAAGTCATAATCCTA
CAGGAGGATTACCCTATTTATTTCACAAACCCTATTTCTACCGGATTTTCATACAAGGAATACAGGCATG
TGTTTCACCTCATTAATTTATTTTTTCACTTAGTTTTGATGATATTCACATATATTATCAAGTGTGCAAA
CATTAAATTCTTGTGTACAAAACTCAAATGGTCTTCCAAATAATTCCCCATTCTTTTTTCTTATAAACTT
TCACAGCTTTACCCTTGACAGACTTTACTCAAGGAAATCTAAGTTGGTCATATGTGGCTCTTTCACTGAT
TGCTATTTACTTCATTGTCCAGTAGCTTATGTATGAAAATATAATTATAAAATGTAAGGGTCCTACTTCC
AGTGAAACTGAAGGGACTTAGGCCCACTTTTATCCTTTACTGAGAGCTTATCTCTACTTGATAAAATTTC
TACTGTATTCTTGGCTTAACTCAGGTCCTGTGATTAAAAAAAAAATGCAAAGTA3′

Discussion-Conclusion

The identity of the sequence with Homo sapiens is of 89,38 %. The e-value is highly

significant..

In Asterias rubens Fab fragment gene was clearly expressed such as Fc receptor gene(Ref.3)

We ‘ll retain the fact that in Ophiocomina nigra, Fab fragment gene appears too in the sequencing.It corroborates indirectly, by its presence, the explanation of a primitive antibody, in ophuirids (Echinodermata)

We recall that Echinodermata shows immune specific humoral reactions, at least for asterids and ophuirids(Ref.1 and 6) : it makes their originality.

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