

Human Oncologic Markers Genes In The Crinoïd:Antedon Bifida (Echinodermata)

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Abstract

Evidence of breast cancer 1 and 2 genes and Estrogen receptor 1 one were found in the genome of the crinoïd : Antedon bifida(an ancestral Echinodermata) in a significant manner.

Key words : Invertebrate, Echinodermata, Antedon bifida, human oncologic marker genes.

Thank you and best regards. Michel Leclerc

Results

Evidence of BRCA1, BRCA2, ESR1 genes occur in Antedon bifida

we complete this table by giving the sequences of BRCA1, BRCA2 transcriptomes :

>TRINITY_DN19334_c8_g2_i1 (BRCA1)

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5'TGTAATCCCAGCACTTTGGGAGGCCGAGGGGGCGGATCACGAGGTCAGGAGATCGAGAC
CATCTGGCTAACACAGTGAACCCCGTCTCTACTAAAAATACAAAAATTAGCCGGGCG
TGGTGGCGGGCGCTGTAGTCCCAGCTACTCGGGAGGCTGAGGCAGGAGAATGGCGTAA
CCCGGAGGCGGAGCTTGCAGTGCAGCCGAGATCGCGCCACTGCACTCCAGCCTGGGCGAC
AGAGCGAGACTCTGTCTCAAAAAAAAAAAAAAAAAAAAAA 3'
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>TRINITY_DN19334_c8_g1_i1 (BRCA2)

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5'GTGCTTAGAAATGCTGCATTATCCGGTGTATCACCTGAGGTCAGGAGTTCGAGACCAGC
CTGGCCAACATGGTGAACCCCGTCTCTATTAATAATACAAAAATTGGCCGGGCGCGTG
GCTCACGCCTGTAATCCAGCACTTTGGGAGGCTGAGGTGGTGGATCACCTGAGGTCAG
GAGTTGAGACCAGCCTGCCAACATGGTGAACCCCGTCTCTATTAATAATACAAAAAT
TGGCCGGGCGCGTGCTCACGCCTGTAATCC 3'
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At last, the sequence of ESR1 is shown

>TRINITY_DN20534_c0_g1_i5 (ESR1)

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5'CGAAGTGTGGTGATATATTGACATTAATTTAAATTTTTCAGAAGACAATATTCTGTGA
GGCAATGTAGCACATCAAGCATCATCAAAACGGAAGCTACAAACGGTGTAGTAGCAACA
TATCAGCAGCATTCTAAAACACATCAGACATCGCACCAGCAGCACAAAGCATACAACGCCA
AGACATCGAATTTTAGTACGACAAGTCGTATGCCGATGAACCGGAATGAAAGAAGTG
AAAGATCATCCATGTCACAAAAATATGTCTACCACTGCAGATTTTATCATCAGTATTT
GGTGCATTGCGCATGGTGAAATGACATTAAGTAAACGCCATAGGACCATTGCGTGGCATTG
TGGGTCAATTTACACAACCGGTGATGTCCAACAAGAGGAACAGTTGCAATCTGGATTCTA
GTTTATGGATCAGCTGGCGTAGCAGTGGGATTGTGGTACTTTGGGAAAAGAGTTATTGAG
ACAGTTGGCGAGGACTTAACACCATTACCGTTTCAAGTGCCTTACAATTGAACCTGGT
TCAGAACACACCGTTCTAGTTGCCTCCAACCTGGGAATACCAATAAGCACACCGCATTGT
AAAGTAGGATCAGTGGTTCGGCTGGATGGGTGAGAACAAAAACAGCAGTTGATTGGAAG
TTGTTCTATGGCATAATTGCAGCCTGGATCATCACACTTCTGCCACTGTTGGTCTTAGT
GCTCTGTCGATGTTCTGCTTCAGAAAACTAGTGTGAACAGAGTTGGATTTTAATAAT
GGTGTATGATAACATAAGTCGTATCATATTATGTTTACCAGGAATACATAGGAATATC
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Introduction

Many investigations concerning the genome of Antedon bifida have been performed in our laboratory (Ref. 1, 2, 3). It seemed interesting to look for genes implicated in cancerology diagnosis which is a true problem of Human Society.

BRCA1, BRCA2, CASC8, CASC16, ESR1, CRP genes were mainly studied.They encode

for cancer susceptibility proteins as breast, ovarian cancers.

Materials And Methods

Animals (Antedon bifida)

were obtained from « the station marine » of Roscoff (France)

Obtention of crinoïd mRNA

Digestive coeca were excised from the A. bifida body.

A. bifida mRNA was obtained from Uptizol (Interchim). Quality control were operated.

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.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.

CGGTAATACAAGGTCATGTGTGGCACAAAGTGTGGCTGTATCATGTAAGGTTAAGAGATGA
 GTATGGCCTATGATACTAGGCAATACATGTGGAGTCCATGTGTATGCTGTATTACCAAATA
 TCCATGTGATACTGGGAAAAATTTAGATAGAACAGAGAATCGGGTGCCTGTTTGGAAAAAT
 CCAATCCATAAGAAAAACAAAAGCCAGTAGCCTATGTCCACACAATGCGAATTCAGC
 AACTTTATTTATGTATTACAGGAAGCTAATATGGAATTAATAAGAGGGGAGGTTATTG
 TATATACGATTGATTGGTATTCCTAGTGACTGAGGGTATAGATGCCGGATATTGGCTG
 ATGCTGTCTTTGATGGTTAATGCATCCCTGGCCATCAAAAATGATTGCAGATAATAAA
 AGTTAACAAATGATCTGAACAGTATCGACTGTAACCTGTCGACGTCAGGATAAGAAATGGG
 GAGGCAGTGAACAAGTAATGGGAGAATATCTGTAATTTTATTTTATCACTTTCTGATG
 TACTGTACAAGTGCATATTGCACAATCCAAAATTTAAATTTAAAAAAAATCATCATAA
 TATATTGTATATGCATTAACAATAACTTATATAGATAATAGTAATTTTTTTAAATTAC
 ATTTTTGTAAATGAATACTTGTCTGTGAGAAGAATTATACTATTGTGTACTAAAGTT
 AGTTATACCTTCATAATAAATTTGATAACATTAACAATAAATAGAATGTATCTATATG
 TGCTTCTTTATAATGGTAATGAGTCAATATTTGAATTTAGCAAACCTCAACAGACTGCA
 CAAACTGTGATGCTTGAGTACAAAATATCTCGATGGTAAAAATCATGTGACAAGGTGTT
 TTGTAATAATAGTTAACATTTAGTAAAAATCCGAAAAAAAACAACATTTTTACTGTGTC
 CTCTTACGAGAGACTGATCTACTACCTTTATTCTATTATTACTTCTATTTAATTAATAC
 TACTAAAACCTGTATAATCCATAATCATATAAACCTTCTAGTTTTTTTTTCAATTTTA
 CTTAAATGTATTAATTTGTTTTTTTGGAGTAGAAATGTGACAACCATCAGCTCAAATC

CAACTTGTAAACATGCATTATTATTGGATTCAATAAAAAAAGAAGAATATATTTAAATA
 CACCGTATTTTACTTCAGTTTGTGCCCTACATAAGGTATTTTGGAAAAACCTTACTACTT
 AAAATATAATACCTTACAGTGGTACTACAATAAACCAAAACCTTTGTCAAATCAAATTAC
 GAAAAGTAATCTATTAATTGATTCTCAGAATACTAAAATTAGTAAATCCTTTAATCCTAA
 CCATATTTCTAAAACCACCAAGGAAAAATTACAATGTGCCAAGGATTACTCAGATTTA
 ATAAAAAATACAGTATATGTACAGTACAAGTTAAATTTTAGTTTAAAATGAAAATAATT
 GATTGAACGGGTTAAAAATCTTTCAGTTGTACAAGTTTGTGCCATATGACCTACTAAC
 CAATGAATAACAACGTGGAAGCTGATTATATAATTAACCAGCAAATTAATTTCTAAGAA
 ATCCCATAGTTCTTGTACCAATCTGTATATTACATTGTGTGTCAGGCTTTGAAGATAGGTA
 TCGCGGCATGGAAGGTCATGTCAGGTCGGAATGTGCTTCCAGACAGGTTACCAACA
 AACAAATCGCATAGCTTGTATGTAATCTTTGTATCCAAGGTGAAGCGATGGTATATTCCT
 GCAGGCAACAACATCAGTCTGTTCTTCCACGGCAATCTCACCAACGTTTCATCCCGA
 TCTCTAAAATCAAAGTAAACCTTCCATCCAGAACAAACCGAATCTCCTCATCCGTATGA
 AGATGTTCTCGAAAAAAGATTTTATTTTTTCTCATAATTTGGGAAGTTTCTCTGGAGAA
 ACAGTTATACAATCTCATAGGAATATCCTCTTTCTTTGCGTATTTTGTCAAGCAACCCT
 TCTTTTTGTAAATTTTCTGCATCTACAGCCAATATTTTATACCATGTGAATCCAAATAG
 TCTAAATCCAACATTTGACAGGCTTAGATGGTGTCAAGGCGTTGATCTTTTTCTTTA
 TCATTATCCATAAACCAAGGCTTTCACCATGTTGACGACTTTTAGTAGACCTATTAGGCC
 AAAGTATCTTTGATTTCAGTCGGAGACCCGCTTGGGAAATATGAC3

Table 01 :

Query ID	Query Name	Subject ID	Identity (%)	Length	Mismatch	Gapopen	Query cover	E-value	Bitscore
NM_007298.3	BRCA1	TRINITY_DN19334_c8_g2_i1	85.3	279	36	3	8	4,00E-75	283
NM_000059.3	BRCA2	TRINITY_DN19334_c8_g1_i1	84.07	113	18	0	1	2,00E-22	110
NM_000125.3	ESR1	TRINITY_DN20534_c0_g1_i5	89.74	39	0	4	1	1,00E-03	47,3

Conclusion And Discussion

In humans, BRCA1 and BRCA2 genes can be considered as oncologic markers. It is said that mutations of these genes are more common in certain ethnic populations than others ; they increase a woman’s risk of breast and ovarian cancer.

As for ESR1 gene, it encodes an estrogen receptor, a ligand activated transcription factor, composed of several domains important for hormone binding.

To find such genes in an invertebrate remains enigmatic but seems interesting from a point of view of the phylogeny of proteins and genomics

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