Brief Report

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Primitive immunoglobulins from ophiocomina nigra igkappa gene when compared to human immunoglobulin kappa locus bioinformatic data

Abstract

Entiere identities between Invertebrate Ophiocomina nigra IGKappa gene and Human IGK gene are confirmed, in the present work, at the level of immunoglobulin domains (constant and variable) and by informatic technology. From now on we 'll speak of Echinoderm primitive Immunoglobulins.

Keywords: immunogoblins, clone, sequence

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Introduction

The transcriptome of the Ophuirid : Ophiocomina nigra IGKappa gene which has been discovered recently.[1] Since it was synthesized de novo and cloned in a pUC-GW-Kan plasmid[2] which was a gift of Bo Huang laboratories+.

Materials

The original sequence of the Ophuirid IGKappa gene, after cloning, was the following in 5'-3'

Original sequence

GAGGAACTGCTCAGTTAGGACCCAGACGGAACCATGGAAGCCCCAGCGCAGCTTCTCTTCCTCCTGCTACTCTGGCTCCCAGATACCACTGGAGAAATAGTG
ATGACGCAGTCTCCAGCCACCCTGTCTGTGTCTCCAGGGGAAAGAGCCACCCTCTCCTGCAGGGCCAGTCAGAGTGTTACCAGCAACTTAGCCTGGTACCAG
CAGACACCTGGGCAGTCTCCCAGGCTCGTCATCTATGGTGCATCCAGCAGGGCCAGTGGTGTCCCAGCCAGGTTCAGTGGCAGTGGGTCTGGGACAGAGTT
CACTCTCACCATCAGCAGCCTGCAGTCTGAAGATTTTGCAGTTTATTACTGTCAGCAGTATAATAAGTGGCCGCACACTTTTGGCCAGGGGACCAAGCTGGAC
ATCAAACGAACTGTGGCTGCACCATCTGTCTTCATCTTCCCGCCATCTGATGAGCAGTTGAAATCTGGAACTGCCTCTGTTGTGTGCCTGCTGAATAACTTCTA
TCCCAGGGAGGCCAAAGTACAGTGGAAGGTGGATAACGCCCTCCAATCGGGTAACTCCCAGGAGAGTGTCACAGAGCAGGACAGCAAGGACAGCACCTAC
AGCCTCAGCAGCACCCTGACGCTGAGCAAAGCAGACTACGAGAAACACAAAGTCTACGCCTGCGAAGTCACCCATCAGGGCCTGAGCTCGCCCGTCACAA
AGAGCTTCAACAGGGGAGAGTGTTAGAGGGAGAAGTGCCCCCACCTGCTCCTCAGTTCCAGCCTGACCCCCTCCCATCCTTTGGCCTCTGACCCTTTTCCA
CAGGGGACCTACCCCTATTGCGGTCCTCCAGCTCATCTTTCACCTCACCCCCCTCCTCCTCCTTGGCTTTAATTATGCTAATGTTGGAGGAGAATGAATAAATAA
AGTGAATCTTTGCAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
AAA

Results and conclusion

The original gene, the original protein issued from this last one share total identity with Homo sapiens immunoglobulin kappa locus, mRNA (cDNA clone MGC:22645 IMAGE:4700961): they have a complete identity (Figure 1) and share nearly 100 AA common, in constant and variable domains respectively.

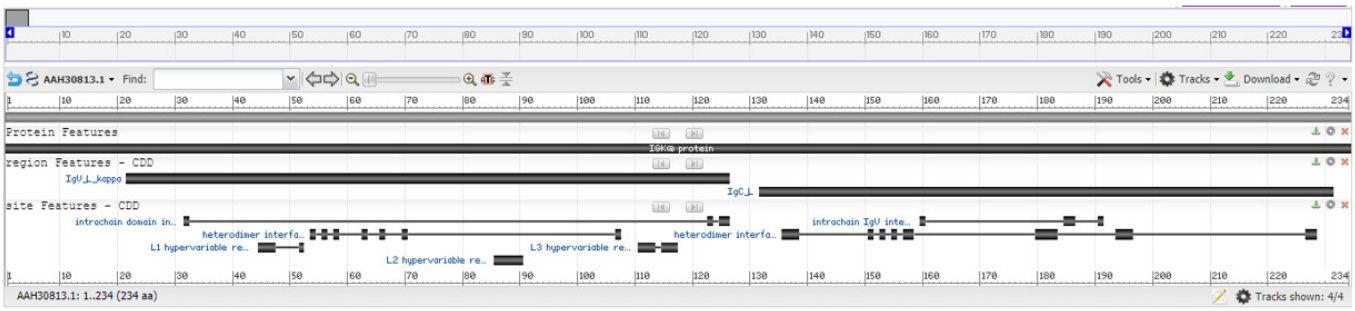

Figure 1 Sequencing of human IGK and Ophiocomina nigra IGKappa gene.

The sequence of the concerned gene is ID: BC030813.1

At last the Protein GenBank[3] has the following number: AAH30813.1 with 234 amino acids as shown below:

MEAPAQLLFLLLLWLPDTTGEIVMTQSPATLSVSPGERATLSCRASQSVTSNLAWYQQTPGQSPRLVIYGASSRASGVPARFSGSGSGTEFTLTISSLQSEDFAVYYCQ
QYNKWPHTFGQGTKLDIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQW
KVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

It is shown in conclusion, that an invertebrate Echinoderm (Ophuirid Class) IGKappa gene shares entire identity with a human immunoglobulin **IGK** (Figure 1). From now on we have to think of: Invertebrate Primitive Immunoglobulin's about Echinoderms as it is said about IPA (Invertebrate Primitive Antibody) also in **Echinoderms.** We have not yet the three-dimensional structure of this protein. On the other hand we have the sea star one which is, in a certain manner its "sister" in the genealogic tree.[4]

In fact, compared sequencing of Human IGK and Ophiocomina nigra IGKappa gene present more 90% in similarities as shown in Figure 1.

In the present time, we don't know the evolutionary process which leads from Echinoderms to Man, in matter of Immunoglobulin "Immunology". If there is an evolution in this process, many steps are requested to explain such a phenomenon, which appears, nevertheless, so suddenly, with also, MHC genes, CDR1, CDR2, CDR3 region? In the Invertebrate Primitive Antibody.[4]

+ We thank greatly Bo Huang Laboratories

IGK@ protein [Homo sapiens] graphic (in dark) by NCBI (https://www.ncbi.nlm.nih.gov/protein/AAH30813.1?report=graph) shares IG domains with Ophiocomina nigra IGKappa protein (in grey) issued from ophuirid IGKappa gene

GenBank: AAH30813.1 protein issued from IGK gene has two immunoglobulin domains:

Region 1

Region: IgV_L_kappa

Comment: Immunoglobulin (Ig) light chain, kappa type, Variable (V) domain

Location: 22…126

Common Length 105 aa

Region 2

Region: IgC_L

Comment : Immunoglobulin constant domain

Location : 132…231

Common Length 100 aa

Acknowledgments

None.

Conflicts of interest

The author declares that there are no conflicts of interest.

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