

Determination of the CDR (CDR1, CDR2) Complementary-Determining Region Invertebrate Primitive Antibody from Sea Star

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ABSTRACT

The IPA (Invertebrate Primitive Antibody) was recently discovered, in the same time of Asterias rubens lymphocytes, humoral specific immune responses and Genomic assays with the sea star IGKappa gene.or anti Horse-radish peroxydase. CDR1 and CDR2 were described in this paper. That corroborates the name of Invertebrate Primitive Antibody and not IG Like protein as it is thought by some people.

Keywords: Invertebrates, Invertebrate Primitive Antibody, CDR1, CDR2.

INTRODUCTION

10 years ago, we tried to clone, for the first time, the Asterias rubens sea star IGKappa gene by the use and the help of E.coli as amplificator [1]. It allowed, in a second time, to verify that the Young Protein, or anti-HRP Protein recognizes the HRP antigen [1]. The work which follows was made possible to the great open-mindedness of Dr S.Kossida (IGH Montpellier).

It consists to research Complementary Determining Regions called more briefly CDR1, CDR2, CDR3. Or Complementary-Determining Regions.

MATERIAL AND METHODS

A recalling of the anti-HRP sea star sequence [1] IGKappa gene (Figure 1) and the method of F.Ehrenmann and Lefranc [2,3] from the IMGT V domain directory were used.

First, anti-HRP sequence in nucleotids/

5'GGA TCC GGA GGA ATG CGTGGCAACATGGCGTCTCTATGGATGTTCTTCTT
TGTCGTGGGGATAACTTTACAACGGAGTTTGGCGATTTACACGTTTCGCG
AGCAACCGTCGGACACTAGCGCGTTGCAGGGGAGCACAGTGGTGCTTCAC
TGCTCCGTTGAGCAGTACATAAACACCACCGCCATCGTTTGGTGGAGCCG
TGACTCGGTCATCAGCCACAACAAAGACCTGAAACTGTCCAGTCTAAACA
CCGACCAGCTCCAAAGGTACTCGATTTCAGGCGACGCATCTCGGGGGGAA
TTCAACCTTAAAATAGTGAACTTTACCGCCACAGACGCCGCCAGTTACCG
CTGTCAGATG TAA GAA TTC3'

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with the tranlation https://web.expasy.org/translate/

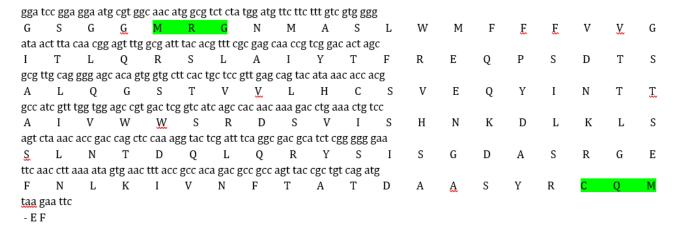


Figure 1. Sea star (Starfish) IGKappa gene sequencing.

OR in ANOTHER WAY

MRGNMASLWMFFFVVGITLQRSLAIYTFREQPS-DTSALQGSTVVLHCSVEQYINTTAIVWWSRDSVISHNKDLK-LSSLNTDQLQRYSISGDASRGEFNLKIVNFTATDAASYRCQMFA

RESULTS

2 tables issued from IMGT resume the following analysis below: I):

https://www.imgt.org/3Dstructure-DB/cgi/DomainGa-pAlign.cgi with default settings, 17/01/2024

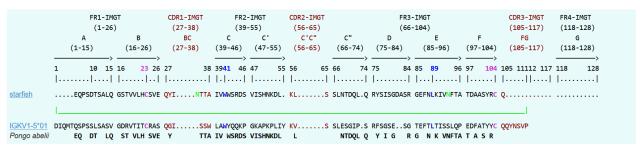
IMGT/DomainGapAlign version: 4.10.3 (2021-12-06)

Closest reference gene and allele(s) from the IMGT V domain directory: (All species)

Species	Gene and allele	Domain	Domain label	Smith-Waterman score	% identity	Overlap	Show alignment
Pongo abelii	IGKV1-5*01	1	V-KAPPA	121	33.3	90	•
Pongo pygmaeus	IGKV1-8*01	1	V-KAPPA	121	33.3	90	0
Homo sapiens	IGKV1-5*03	1	V-KAPPA	119	33.3	90	0
Homo sapiens	IGKV1-5*04	1	V-KAPPA	119	33.3	90	0
Homo sapiens	IGKV1-5*05	1	V-KAPPA	119	33.3	90	0
Species	Gene and allele	Domain	Domain label	Smith-Waterman score	% identity	Overlap	
Pongo pygmaeus	IGKJ4*01	1		7	100.0	1	

II) Table II Alignments

Alignment with the closest gene and allele from the IMGT V domain directory: (All species)



>starfish|IGKV1-5*01|33.3|||Pongo abelii

FTATDAASYRCQ.....

.....EQPSDTSALQGSTVVLHCSVEQYI.....NTTAIVWWSRDS-VISHNKDL.KL......SSLNTDQL.QRYSISGDASRGEFNLKIVN- The conserved amino acids (positions 23, 41, 89, 104) are found in the starfish sequence.

This molecule appears to have an IG AA sequence as seen from the above analysis.

 If it aligns with the Pongo IGKV1-5, the percentage of alignment is 33%, so it is a sequence that seems to have similarities to an IGKV gene when it comes to conserved amino acids.

DISCUSSION

It appears clearly that CDR1 and CDR2 exist in the sea star primitive antibody and not clearly for CDR3 (1 amino acid which is conserved).

Undoubtly

These new parameters [4] corroborate the existence of an Invertebrate Primitive Antbody and NOT IG-LIKE as it is often said. We recall also the discovery by us of T and B sea star lymphocytes [5] Humoral specific response [6] Genomic data [7].

ALL these elements assess the existence of an IPA: Invertebrate Primitive Antibody which shares strong sequence alignments (at least for CDR1 and CDR2) with the Primate: Pongo pygmaeus.

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