

## The IPA (Invertebrate Primitive Antibody) and Viral Diseases

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### INTRODUCTION

In the years 1980, we have discovered vaccination in Echinodermata by immunizations with various antigens (with or without Freund'adjuvant).

Later, with co-workers, we discovered the sea star IgKappa gene. Its sequence was composed of about 435 nucleotides.

The work was published at Meta-Gene in 2016 (Vincent N et al).

We have studied the effects of sea star IgKappa gene on cancerous human cells (Hela cells, Melanoma cells). Mainly the sea star Igkappa gene, incorporated in a plasmid (CMV plasmid), exerts a high spontaneous cytotoxicity against Hela cells.

But it doesn't constitute, in fact, in the present time, a good therapy for Cancer diseases.

On the other hand, we consider that the sea star Igkappa gene and the IPA (Invertebrate primitive antibody) are "PRIMITIVE" :

A primitive gene, a primitive protein..

So, as "Young" elements, they may play a role, in immunotherapy of various diseases, in particular viral diseases

It is why, we envisage to use them in coronavirus disease and particularly Covid 19 disease. We think that this primitive antibody

may add a positive effect to immunodeficiency pathology which was provoked by covid invading, viral invading.

To day we envisage Immunology with a new light: We have a sea star Igkappa gene, An Invertebrate Primitive Antibody.

The sea star Igkappa gene is very high in the phylogeny of the immune system of animals

It shows already two Ig sites ! The forms of Igkappa genes are all found in vertebrates, they share many details with the sea star, including the presence of Ig sites (Ref1 : Vincent N et al 2016)

### Sequence of the Sea Star Igkappa Gene

```
GGA TCC GGA GGA ATG CGTGGCAACA
TGGCGTCTCTATGGATGTTCTTCTT
TGTCGTGGGGATAACTTTACAACGGAGTTT
GGCGATTTACACGTTTCGCG
AGCAACCGTCCGACACTAGCGCGTTGCAG
GGGAGCACAGTGGTGCTTCAC
TGCTCCGTTGAGCAGTACATAAACACCAC
GGCCATCGTTTGGTGGAGCCG
TGACTCGGTCATCAGCCACAACAAAGACC
TGAAACTGTCCAGTCTAAACA
CCGACCAGCTCCAAAGGTACTCGATTTCA
GGCGACGCATCTCGGGGGGAA
TTCAACCTTAAAATAGTGAACCTTACC GCC
ACAGACGCCGCCAGTTACCG
CTGTCAGATG TAAGAA TTC
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This gene induces an anti-HRP (Horse-radish peroxydase) primitive antibody which can be also produced by human Hek 293 EBNA according the method of Durocher ( Ref.2) or by

Incorporation in a E.coli plasmid as it was said precedently.

In conclusion, the IPA may be used as a primitive synthetic antibody to cure the various immune deficiencies as the viral ones

### REFERENCES

- [1] Vincent N. et al (2014) Meta gene 2:320-22
- [2] Labbé D. et al (2018) Methods Mol. Biol 1850:1-16

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