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Existence of At Least 2 Classes of Ipa in Sea Star Immune System Comparisons Between Asterias Rubens and Other Asterids

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Introduction

In 1986, we isolated (Delmotte et al, Eur J Immunol) an antibody-like factor composed of 4 subunits of 30 kDa each: It was an anti-TNP (TNP=Trinitrophényl) antibody-like substance.

Later in 2011, with the help of Genomics, we discovered an anti-HRP Kappa gene (HRP=Horse-radish peroxidase) in the genome of the sea star Asterias rubens (Leclerc et al, Immunol. Lett) from animals immunized to HRP.

In 2014, A new gene: a sea star IG Kappa gene, showing 2 IG sites, was obtained, always from the Asterias rubens genome (Vincent et al, Meta gene): it was called: IPA (Invertebrate Primitive Antibody).

Then, we found a recombinant protein issued from the cloning of the sea star IG Kappa gene through HeK cells (Leclerc 2021, Ejbio)

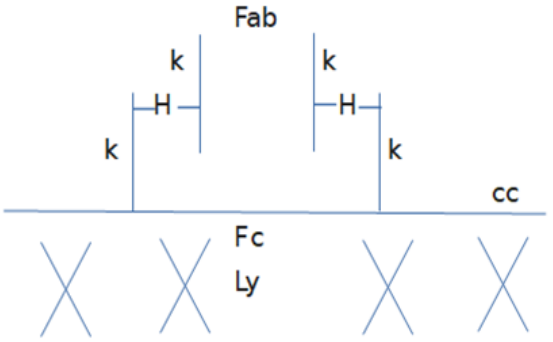
The corresponding protein, in SDS -Page had a molecular weight of 14kDa

Conclusion

There are at least 2 CLASSES OF IPA (Invertebrate Primitive Antibodies) that coexist in the sea star immune system. The first IPA (anti-TNP) has an M.W of 30kDa and may be compared to the sea star factor which was found in Asterias forbesi (Prendergast et al 1976 in Scand J. Immunol). The sea star factor doesn't possess Ig domains, it had an M.W of 38kDa and was composed according to Prendergast of a « heavy chain » and a « light one ». The second IPA has a molecular weight (MW) of 14 KDA.: it belongs to Kappa genes (light chain of IG), the first one remains enigmatic when compared to Vertebrate Immunoglobulins: a schema of this anti-TNP antibody was purposed by Leclerc in 2020 (Fig 1)

We try, for the first time, to imagine the anti-TNP IPA in the following schema: it shows on the cell coat(cc), 4 kappa chains(k) in equal length, the Fab fragment, the Fc receptor which is situated on the sea star lymphocyte side (Ly)

It's a tetrameric constitution.



Invertebrate Primitive Antibodies are supposed to possess anti-viral activity. And may constitute Nanobodies (Leclerc 2022), especially the anti-HRP antibody we try to imagine, in the future, first as schema, and secondly as nanobodies. (Leclerc 2022).

Conflict Of Interest

The authors declare no conflict of interest.

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