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REPORT OF MEETING

XXth scientific meeting of the Italian Association of Developmental and Comparative Immunobiology (IADCI), 13 - 15 February 2019, Department of Biology, Ecology and Life Sciences, University of Calabria, Rende, Italy

Organizers: **A Giglio[1], P Brandmayr[1], F Talarico[1], A Mazzei[1], S Marsico[2], A Naccarato[3], F Cavaliere[1], ML Vommaro[1], MC Granieri[1]**

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I met you when I was very young,
at the beginning of my professional life,
and I immediately understood
that you were reserving many surprises;
I followed you in silence
when your secrets have been revealed;
how do you always be the same and always different,
the "God problem" revealed.
I admired your anatomy,
simple, elegant,
based on harmonic couplings of a wonderful domain,
classic like a Doric temple;
I admired the flexibility of your body:
the movements of the hips and elbows,
your fingers that shape the socket.
I was entranced by the dynamics of your dance.

Then I had the pleasure
to be the only one to own you in the frost of polar ice,
where you appeared to me alone,
only wonder, generated by an evolutionary miracle.

It is true that I have been unfaithful to you;
I was attracted to other molecules,
from the aesthetics of the baroque forms of the Toll-like Receptors,
from the molecular labyrinth of the third factor of the Complement,
that is leafed in luminous fragments up to the small,
but multipotent, anaphylatoxin.

Now I will not see the many sure marvels
that you reserve to those
who will follow you in the future
but I have the memory
to have loved the most beautiful of the molecules:
Immunoglobulin.

By Umberto Oreste, past Researcher at Institute of Protein Biochemistry, National Council of Research, Naples (Italy)

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It is now widely accepted that microplastics (MPs) represent a serious concern for aquatic environments, therefore assesment of biological pathways affected is crucially relevant.

This study focused on variations of liver transcriptome, histology of gastrointestinal tract and gills, and locomotor activity of exposed fish along various days after treatment.

Adult zebrafish (3 groups, N=12 each) were fed for 20 days with dry food alone (controls) or supplemented with a mix of pristine high-density polyethylene and polystyrene microplastics (0.1 or 1 mg/L), ranging in size from <25 to 90 µm.

The exposure to MPs resulted in differential transcription of 324 genes in total, already affected at the lower dose, mainly involved in cholesterol biosynthesis (fatty acid degradation) and immunity pathways.

Up-regulation of transcripts subserving response to extra-cellular antigens, and down-regulation of others involved in innate antimicrobial response, antiviral defense and maintenance of epithelial integrity highligted defective control of pathogen entry at epithelial barriers, confirmed by occurrence of histopathological signs in both intestine and gills. Furthermore, variations in energy utilization likely accounted also for alteration of circadian rhythm of locomotor activity.

Immunodetection of IgM, IgT and pIgR in mucosal tissues of Antarctic teleost

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We have previously investigated the immune response at hepato-biliary level in the Antarctic teleost *Trematomus bermacchii*, a species belonging to the Perciform suborder Notothenoidei, the most abundant component of the fish fauna living in the Antarctic ocean. By that time only the IgM isotype was known and well characterized at molecular and biochemical levels in Antarctic fish.

Over the past few years we have cloned and sequenced genes encoding other two key molecules of the mucosal immune system, IgT and polymeric Ig receptor (pIgR) of T. *bernacchii*. The present study aimed at investigating the localization in mucosal tissues of IgM, IgT and pIgR in an attempt to clarify the protein occurrence and transepithelial transport. Biochemical and immunohistochemical data provided convergent data about specific mechanisms operating apical release of IgT in exocrine way, as well as depicting peculiar (maybe ancestral) features compared with well-known mechanisms described for polymeric Igs transport in mammalian tissues.

F-type lectin from serum of *Trematomus bernacchii* (Boulenger, 1902): purification, characterization and bacterial agglutinating activity.

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Lectins belong to a protein family, present in almost all living organisms and involved in several biological processes, including immune responses. Peculiarity of these proteins is the ability to bind carbohydrates due to their carbohydrate-recognition domains (CRDs).

In fish, C lectin, F binding lectin (FBL), galectin, Rhamnose-binding lectin (RBL) and pentraxin have been identified in both cartilaginous and bony fish. In addition, selectins and other genes have been found in the currently available fish genomes.

The FBL, known as fucolectins, constitute the most recent lectin family identified and structurally characterized in teleosts. The FBL family is constituted by a large number of proteins exhibiting multiples of the F-type motif, either tandemly arrayed or in mosaic combinations with other domains.

In the present study, a FBL has been purified and characterized from serum of the Antarctic fish *Trematomus bernacchii* by affinity chromatography on fucose-agarose column. Assay of inhibition from carbohydrates in fact showed affinity of this lectin for the fucose. A convincing Hemoagglutinating activity (HA) was detected towards rabbits red blood cells (RBC) and at lesser extent towards sheep erythrocytes.

The HA activity was analyzed at different temperatures. It was maintained at temperature values comprised between 4 °C and 37 °C and was completely depleted after exposure at 50 °C. In SDS-PAGE analysis, the FBL exhibited an apparent Molecular weight of 30 kDa in non-reducing conditions and an increase to 32 kDa after reduction. This difference is recognized as a classical shrinkage of F-lectins, due to the present of internal disulfide bridges.

The F lectin present on the *T. bernacchii* transcriptome show a very similar and congruent structure with a theoretical Mw 32.16 kDa and an isoelectropoint of 5.21.

Bacterial agglutinant activity (BA) of serum and purified fractions was tested towards *E. coli*. The serum showed high activity after incubation at room temperature (18 °C), as well as in the fractions. The sequence, structure, sugars specificity, fucose inhibition, molecular weight, protein shrinkage and activity against bacteria collocate this molecule on F-lectin family and thus suggesting its involvement in host pathogen interactions.