[4]NBFC, National Biodiversity Future Center, Palermo, Italy
*co-senior authors

Halla parthenopeia is a marine annelid which colonize soft bottom of the Mediterranean Sea. Due to its endemicity, ability to regenerate and to colonize habitats richly populated by pathogens it has a great potential as a model of study in different fields, including eco-immunology and blue biotechnologies. The latter aim to the identification of new compounds from marine organisms useful for the human health. During feeding, locomotion and predator defense, *H. parthenopeia* produces different types of mucus which are rich of bioactive compounds, with at present unknown biological roles and applications.

In order to observe its behaviour, to study its biology and to obtain a significant amount of mucus for bioactive compound purification, the worm husbandry was optimized in *ad hoc* designed aquarium systems. The easily collectable defense mucus, secreted by *H. parthenopeia*, contains a toxic anthraquinone known as Hallachrome. This compound showed a minimal inhibitor concentration (MIC) of 0.12 mM and 0.06 mM for Gram positive bacteria and for *Candida albicans*, respectively. Given the effect of Hallachrome on human pathogens, it could be used by animals as a defense against pathogens present in the sediment, or to control the microbial environment into the tunnels.

Antimicrobial peptides (AMPs) represent molecules that could integrate the action of Hallachrome. However, as for many non-model animals, studies on *H. parthenopeia* suffer from the lack of omics data and optimized experimental protocols. The whole-body RNA extraction protocol was optimized to obtain good quality RNA for transcriptomic studies. The *de novo* transcriptome, in association with tissue-specific proteomics, will serve as database for *H. parthenopeia* blue biotechnology-oriented studies.

While developing transcriptomic data, the purified mRNA was used for RT-PCR analysis aimed at identifying immune-related soluble factors constitutively expressed by the worm. First positive reactions included the AMP bactericidal/permeability-increasing protein (BPI)-like transcript and the immune mediator Lipopolysaccharide binding protein (LBP)-like transcript, immune-related factors already observed in other annelids.

In conclusion, this study presents the first evidence on the humoral defense of *H. parthenopeia* with the aim to offer a new research organism to the fields of eco-immunology and blue biotechnologies.

Actinins as novel broad-spectrum AMP isolated from the tentacle of Anthozoan *Actinia equina* (Linnaeus, 1758)

M Cammarata, M Dara, C La Corte, L Bisanti, V Catania, D Parrinello, MG Parisi

Marine Immunobiology Laboratory, Department of Earth and Marine Science Ed 16, University of Palermo, Palermo, Italy

Capturing activities and defense mechanisms of Cnidarian are strongly associated with toxins and peptide with antimicrobial properties. AMP are an important component of many organisms' innate immune system with a good inhibitory or killing effect against invaders pathogens.

We investigated the AMP activity of acid extracts obtained from tentacle and body of *Actinia equina* (Cnidaria, Anthozoa) against Gram positive (*Micrococcus lysodeikticus*) and Gram negative (*Escherichia coli*, *Vibrio alginolyticus*) bacteria. The peptide fractions showed interesting minimum inhibitory concentrations (MIC) values (concentrations up to 0.125 µg/ml) against tested pathogens. Tentacle acid extracts exhibiting a good antimicrobial activity, were further investigated, characterized and the peptides purified by reverse phase chromatography on solid phase Sep-Pak C8 column followed by several HPLC runs on C18 column. A broad-spectrum antibacterial peptides activity was detected in 40 % acetonitrile fractions.

The Peptide 6.2 has a molecular weight of 2612.91 Da and is composed of 27 amino acids (Actinin A); while peptide 7.3 has a molecular weight of 4323.07 Da and is composed of 35 amino acids (Actinin B).

The two peptides were completely sequenced and their aa sequence revealed similarity with the already described AMPs identified in amphibians and fish, with anti-Gram+ & Gram-, antifungal, candidacidal, anti- Methicillin-resistant *Staphylococcus aureus* (MRSA) activity Actinins A and B were chemically synthesized and tested in vitro against the above-mentioned bacterial pathogens. The analysis identified the peptide Actinin B which showed an interesting antibacterial and can be considered good candidates for new therapeutic applications.

Session 5. Embryogenesis, development and regeneration. Chairpersons: Annalisa Grimaldi University of Insubria, Varese, Italy and Jacopo Vizioli, University of Lille, Lille, France

Hemocytes, motile cells and immune-related mediators in adult sensory organ regeneration: evidence from the evolutionary distant models *Pomacea canaliculata* (Mollusca, Gastropoda) and *Nematostella vectensis* (Cnidaria, Anthozoa)

G Bergamini[1], S Sacchi[2], S Basu[3], M Ahmad[1], A Ferri[1], M Cocchi[1], A Ikmi[3], D Malagoli[2,4]
[1]*Department of Chemical and Geological Sciences, University of Modena and Reggio Emilia, Modena, Italy*
[2]*Department of Life Sciences, University of Modena and Reggio Emilia, Modena, Italy*
[3]*Developmental Biology Unit, European Molecular Biology Laboratory (EMBL), Heidelberg, Germany*
[4]*National Biodiversity Future Center (NBFC), Palermo, Italy*