

increase of apoptotic cells in gonads of specimens from the B-area, no matter the period. The collected data demonstrate that mussels are excellent sentinel organisms also for the assessment of endocrine disruptors, and point out the importance of water quality parameters on health status of mussel specimens. Understanding the vulnerability of mussel beds to specific contaminants could inform and improve the management of mussel farms.

Session 6.1. Environmental challenges and the immune response. Chairpersons: Piero G. Giulianini, University of Trieste, Trieste, Italy and Gianfranco Santovito, University of Padua, Padua, Italy

Bio-plastic recognition by mussels hemocytes

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The growing use of bio-polymers derivatives poses an increasingly pressing problem regarding their environmental sustainability. In particular, it should be still ascertained the claimed absence of direct and indirect influence on ecosystems and the health of living organisms, including humans.

Our goal was about assessing the potential effects of poly-lactates and polyhydroxyalkanoates, the most widely used bio polymers classes with promising different applications for replacing conventional plastics on natural aquatic environments.

We chose *M. galloprovincialis* as sentinel species since their extensive filter-feeding activity. When it is exposed to microparticles can bioaccumulate them in soft tissues and organs. In the immunobiological investigation, to highlight if bio-polymers can influence the marine ecosystems, *in vitro* exposure assays on bivalve mussel have been carried out, and their impacts have been explored, by evaluating the cellular response of hemocytes referred to their phagocytic and/or encapsulation activity.

Preliminary evidences have shown that bioplastic particles behave in a very similar way to fossil plastic triggering the immuno-system and activating the elimination of non-self particles via cellular response. As future perspectives, although it is widely recognized that *in vitro* testing is an effective method for defining the effects of emerging pollutants, the *in vitro* test will be further deepened with *in vivo* experiments.

The medicinal leech as a valuable model to evaluate the effect of polypropylene micro and nanoplastics on innate immune response activation

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Among the different types of plastic, polypropylene (PP) is one of the most widespread, widely used in the food and textile industries for disposable packaging and to produce surgical masks. Due to the enormous distribution and the consequent abundant presence of PP waste products, it is necessary to investigate the possible toxicity on living organisms. In particular, successful regeneration requires precise coordination of multiple processes, such as clearance of cellular debris, progenitor cell activation and proliferation, immunomodulation, angiogenesis, and granulation tissue formation. The presence of PP micro (MPs) and nanoplastics (NPs) could hinder regenerations as their ingestion depletes energy reserves, reduces nutrition, survival and immune response.

Here we demonstrate that the medicinal leech *Hirudo verbana*, considered as a substitute method not subject to legislative restrictions (Legislative Decree 26 /2014), is a useful and promising model to elucidate the effects of PP on the inflammatory response. Fluorescent PP, in which a probe was introduced into the carbon chains of the polymer, has been used to better follow the plastic fate in tissues and cells of leeches exposed to water dispersed PP MPs and NPs and to evaluate their potential effect on the innate immune response stimulation as compared to not exposed leeches. Data here presented demonstrate that PP debris entering leech tissues cause morphological changes in body wall organization and increase both inflammatory and fibrotic responses, altering proper extracellular matrix and collagen deposition.

Cytotoxicity of ether perfluoro carboxylic acid PFAS congeners in earthworm granulocytes

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Soil pollution has enormously increased in the last decades. From different type of pollutants Per- and polyfluoroalkyl substances (PFAS) are found in the soil due to their various industrial uses (e.g., anti-fire foams, fluoropolymer resins such as Teflon; separation processes; textiles; cosmetics) and their high persistence. Most emerging PFAS congeners do not have toxicity data that would allow an environmental assessment. Biological approaches to soil monitoring, such as the measurement of biochemical and cellular responses to pollutants (i.e., biomarkers) on organisms living in the soil, have become of major importance for the assessment of the quality of soil. Aim of this work was to investigate the effect of these substances from an eco-toxicological point of view on non-target species, using PFAS as a reference standard. For this purpose, our study focused on assessing the potential cytotoxicity and genotoxicity of four different PFAS congeners (PFOA, HFPO-DA, PF4MOBA, PF3MOPrA) on immune system cells