

hemopoietic precursor cells into muscle and myofibroblasts cells.

These studies enabled us to clarify some key processes concerning the role of cytokine signaling on progenitor cells differentiation, muscle regeneration and wound healing. Starting from these promising results, we propose the medicinal leech, whose experimental use is not subjected to legislative restrictions, as an emerging experimental model for the production of invertebrate cell lines endowed with innovative biotechnological potential and in support of vertebrate cell lines-based research.

To this aim, using the consolidated MG technique and combining it with the cytokines PDGF (Platelet-Derived Growth Factor) and EGF (Epidermal Growth Factor), we have isolated different leech cell populations and cultured them in vitro in a medium containing Fibroblast Growth Factor 2 (FGF2), Transforming Growth Factor- β (TGF- β) or *HvRNASET2* enzyme. The cell responses have been then evaluated by both morphological and immunocytochemical assays.

Concurrently, an expression vector (pEGFP-N1) containing the leech's Actin 1 minimal promoter was created in order to perform, for the first time, transfection experiments aimed at producing immortalized leech cell lines which, in addition to the relative scientific interest due to their sheer diversity, will provide the potential for multiple applications, such as assays for ecotoxicological analyses.

Session 3. Model organisms for basic and translational immunology. Chairpersons: Nicola Franchi, University of Modena and Reggio Emilia, Modena, Italy and Daniela Melillo, National Research Council of Italy, Naples, Italy

The multiple potentialities of anthozoans: analyses and comparisons between animal models

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Anthozoans are the richest class of species of the phylum Cnidaria. They are a candidate group for studying the evolution of mutualisms and immunity and despite their morphological simplicity exhibit a repertoire of immunological components with large genomes and gene families similar to those of the Bilateria.

Like other invertebrates, anthozoans immunity is based on self/non-self recognition mechanisms and allorecognition responses, therefore, maintaining their integrity and responding actively to selection pressures.

Highlight and investigate the link between innate immunity, homeostasis maintenance, inflammation, tissue remodelling and regeneration in Anthozoa could be useful to elucidate the adaptive capability features to different stress factors.

We have carried out studies demonstrating that all these processes are highly conserved among the

anthozoans species. We have compared the inflammatory responses and the morpho-functional aspects related to regeneration in different species of Mediterranean anthozoans using histological, cellular and molecular technical approaches on organisms, maintained in aquaria under environmental and pathogenic stressful conditions.

This approach appears to be a useful tool from baseline studies in immunology and anthozoans result valid models able to respond to environmental stress conditions. Important results have been obtained with potential biotechnological transferability in pharmacology.

The protochordate *Ciona robusta* as an experimental system for studies of gut microbial immune interactions

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The recognition that animals exist as metaorganisms suggests that attention should be focused on defining host-microbe interactions in not just pathogenic conditions, but during health as well. For example, the gut microbiota serves vital roles in various aspects of animal life, including development of the immune system and influence of host physiology. The gut immune system, and specifically the innate immune components, is at the forefront of the crosstalk between host and microbes, where colonization by commensal microbes is tolerated while pathogens are resisted. This dialogue is evolving and is shaped by encounters with a continuum of microbial species. Establishing diverse experimental systems is essential for understanding the fundamental rules legislating these ecological interactions.

Ciona robusta, a marine invertebrate belonging to the subphylum of Protochordate, a sister taxon to vertebrates, represents an ideal experimental system for such studies: it is a highly tractable model that engages with a complex environment using only innate immunity and develops into transparent juveniles with a digestive tract that is easy to stage, dissect and study the steps shaping microbial colonization dynamics.

Our group is establishing this model for defining critical host-microbiota interactions, combining approaches of microbiology, molecular biology, biochemistry, and functional assays. We have identified and characterized some components of the *Ciona* gut environment, and these include the presence of a gut epithelium layered with chitin-rich mucus, secreted immune effectors, namely the immunoglobulin-like variable region-containing chitin-binding proteins (VCBPs) and a stable gut microbiome in adults that includes abundant and diverse bacteriophages. A large catalog of cultured bacteria and fungi, from which cultured juveniles