

MARISTEM: A COST Action Focused on Stem Cells of Aquatic Invertebrates

Authors : Arzu Karahan, Lorian Ballarin, Baruch Rinkevich

Abstract : Marine invertebrates, the highly diverse phyla of multicellular organisms, represent phenomena that are either not found or highly restricted in the vertebrates. These include phenomena like budding, fission, a fusion of ramets, and high regeneration power, such as the ability to create whole new organisms from either tiny parental fragment, many of which are controlled by totipotent, pluripotent, and multipotent stem cells. Thus, there is very much that can be learned from these organisms on the practical and evolutionary levels, further resembling Darwin's words, "It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change". The 'stem cell' notion highlights a cell that has the ability to continuously divide and differentiate into various progenitors and daughter cells. In vertebrates, adult stem cells are rare cells defined as lineage-restricted (multipotent at best) with tissue or organ-specific activities that are located in defined niches and further regulate the machinery of homeostasis, repair, and regeneration. They are usually categorized by their morphology, tissue of origin, plasticity, and potency. The above description not always holds when comparing the vertebrates with marine invertebrates' stem cells that display wider ranges of plasticity and diversity at the taxonomic and the cellular levels. While marine/aquatic invertebrates stem cells (MISC) have recently raised more scientific interest, the know-how is still behind the attraction they deserve. MISC, not only are highly potent but, in many cases, are abundant (e.g., 1/3 of the entire animal cells), do not locate in permanent niches, participates in delayed-aging and whole-body regeneration phenomena, the knowledge of which can be clinically relevant. Moreover, they have massive hidden potential for the discovery of new bioactive molecules that can be used for human health (antitumor, antimicrobial) and biotechnology. The MARISTEM COST action (Stem Cells of Marine/Aquatic Invertebrates: From Basic Research to Innovative Applications) aims to connect the European fragmented MISC community. Under this scientific umbrella, the action conceptualizes the idea for adult stem cells that do not share many properties with the vertebrates' stem cells, organizes meetings, summer schools, and workshops, stimulating young researchers, supplying technical and adviser support via short-term scientific studies, making new bridges between the MISC community and biomedical disciplines.

Keywords : aquatic/marine invertebrates, adult stem cell, regeneration, cell cultures, bioactive molecules

Conference Title : ICHISCR 2021 : International Conference on Hemato Immunology and Stem Cell Research

Conference Location : Jerusalem, Israel

Conference Dates : November 29-30, 2021