AITI VIZZINI, FELICIA DI FALCO, DANIELA PARRINELLO, MARIA ANTONIETTA SANFRATELLO, MATTEO CAMMARATA

Department of Biological Chemical Pharmaceutical Science and Technology, Animal Biology and Anthropology Division, University of Palermo, Italy

CYTOKINES IN THE INFLAMMATORY RESPONSE OF THE ASCIDIAN *CIONA INTESTINALIS*

The *Ciona intestinalis* inflammatory response to several harmful agents have been demonstrated to be composed of a complex set reaction. The cellular reactions involve hemocyte activity and infiltration, cell disruption, while cell products can contribute to form capsule components and/or cause a wound. In this response the involvement of the pharynx, as the main immune-competent organ, has been disclosed by lipopolysaccharide (LPS) challenge that upregulates innate immunity genes. In vertebrate cytokines modulate the balance between humoral and cell-based immune responses, and they regulate the maturation, growth, and responsiveness of cell populations that have pleiotropic functions in a broad range of cell types. Proinflammatory cytokines, that are master key molecules of immune response and disease with large biotechnology and biomedical applications, plays a key role in the clearance of extracellular bacteria promoting cell infiltration and production of several cytokines. In this studies we focusing on identification and the role of Transforming Grow Factor (TGFβ), three form of Interleukins 17 (IL-17) and Tumor Necrosis Factor (TNFα) cytokines in the inflammatory process induced by LPS in ascidian *C. intestinalis*. Real time PCR analysis showed that *Ci*TNFα and *Ci*IL-17s were up-regulate at 1-4 hours post injection, suggesting that are involved in the first phase of inflammatory response; *Ci*TGF-β results transcriptionally up-regulated also in the first phase but significant in the secondary phase of inflammatory response (48-72 hours) in which a cell differentiation occur. *In situ* hybridization assays disclosed that the genes transcription was upregulated in the pharynx and expressed by hemocytes located in tightly packed cell groups within the vessel lumen inside the pharynx. The gene organisation, phylogenetic tree and structural modelling supported the close relationship with the vertebrate cytokines homologues.