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## **SPECIFIC INFLAMMATORY RESPONSE OF *ANEMONIA SULCATA* (CNIDARIA) AFTER BACTERIAL INJECTION CAUSE TISSUE REJECTION AND ENZYMATIC ACTIVITY ALTERATION**

The evolution of multicellular organisms was marked by adaptation to protect against pathogens. The mechanisms for discriminating the "self" from "non-self" have evolved into a long history of cellular and molecular strategies from damage repair to the co-evolution of host-pathogen interaction. The phylum of Cnidaria is one of the first branches in the tree of animal life to provide crucial insights on the evolution of immunity. Sea anemones (Anthozoa, Cnidaria) are benthic sessile species able to maintain the integrity of the tissues and allorecognition in colonial forms and to differentiate between symbionts and pathogenic intruders. We investigated the inflammatory response in sea anemone *Anemonia sulcata* following injection of various substances different in type and dimension, and observed clear, strong and specific reactions especially after injection of *Escherichia coli* and *Vibrio alginolyticus*. In particular we studied the effect of injection of different sized suspensions (LPS, Phenyl Sepharose, cellulose, red blood cells, bacteria) into the pedal disk of specimens in order to observe differential physical, biochemical and enzymatic reactions. The first phenomenon we observed was a body and foot swelling, followed by the formation of a yellowish rejection zone. A further study was also carried out by a histological analysis for the characterization of the area of rejection. This specific response suggested an extrusion of the material damaged by the animal, probably from the pores cinclides from which protrude the *acontia* in the pedal disk, a defense mechanism that has not yet been found in other cnidarians. Moreover, we analyzed enzymatic activity of protease, phosphatase and esterase, showing how the injection of different bacterial strains alters the expression of these enzymes, that catabolize prey tissues, suggesting a correlation between the appearance of the inflammatory reaction and the modification of enzymatic activities. Our study shows for the first time, a specific inflammatory-like response rejection and enzymatic responses following injection of bacteria in cnidarian.