The Protein Expression of the Sp.185/333 Gene Family in the Immune System of Purple Sea Urchins

Snead, Marcelle (School: The Cambridge School)

Researchers have recently found that the immune system of purple sea urchins is more diverse than previously believed. The diversity within the purple sea urchin immune system is derived from the array of different Sp. 185/333 proteins found within each individual urchin. Moreover, diversification is promoted by the frequent recombination of the proteins, leading to new proteins, which elicit new responses. Building on the research into the immune system of purple sea urchins done in the past decade, this experiment concentrates on proving the diversity of the protein expression of the Sp. 185/333 gene family in the immune system of purple sea urchins. This experiment shows the extent that their immune system is specific and similar to that of vertebrates, specifically humans. The main purpose of the experiment is to show that this immune gene has a component that directly targets certain bacteria. This experiment looked at how the proteins in the Sp. 185/333 gene family are expressed when challenged by three different bacteria and yeast. The data show that the Sp.185/333 proteins were expressed at different amounts depending on the bacteria the proteins were bound to. The findings of this experiment show that the purple sea urchin has a region in its immune system analogous to the alternative splicing region found in vertebrates. The purple sea urchin immune system has two responses, a general response, which is the same for all pathogens, and a specific response like that of vertebrates.