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Proteomic Analysis of the Purple Sea Urchin, *Strongylocentrotus purpuratus*, in Response to Acute Heat Stress

The protein expression profiles were studied to investigate the tolerance of sea urchins to acute heat stress. Adult purple sea urchins, *Strongylocentrotus purpuratus*, were obtained from Santa Barbara, Ca. They were acclimated to 10°C and were divided into four groups. Three of the groups were separately heat shocked to 15°C, 20°C and 25°C and returned to the control temperature of 10°C for a recovery time period. The ambulacral tissue within each sea urchin was removed and homogenized. Proteins were precipitated out of each sample solution, where they were separated according to their isoelectric point (pH 4-7) and molecular mass with two-dimensional gel electrophoresis. Protein spots that were significantly different between groups, using Delta 2D gel image analysis software, were excised and digested with trypsin. These protein peptides were analyzed with a matrix-assisted laser desorption ionization (MALDI) tandem time-of-flight mass spectrometer. Using the expression profiles of significant proteins between each of the heat shock groups and the control, we can construct a physiological model of the purple sea urchin under acute heat stress.