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MARINE MAMMAL HEALTH MANAGEMENT BASED ON IMMUNE SYSTEM RESPONSE
TO STRESS AND INFECTIOUS DISEASE

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Knowledge of the interrelationship of stress, immunology and infectious disease is basic to management of preventive medicine programs. Diagnostic and prognostic indicators of the dynamics of this interrelationship are not as well defined in marine mammals as they are in terrestrial animals.

Our objectives were to correlate a newly developed immune system indicator, radioimmunoassay of immunoglobulins, with some indicators of stress: erythrocyte sedimentation rate, serum cortisol levels, eosinophil numbers, free iron in serum, blood gasses and more traditional complete blood counts, to determine some effects of stressors on the immune system of five newly collected Tursiops truncatus gilli. This data was analyzed and related to the dolphins responses to changes in bacteria cultured from their blow holes.

Analysis of periodic blood samples indicated increased sedimentation rates within one week and decreasing serum iron correlated with the change in bacterial flora from Vibrio alginolyticus, (normal in dolphins in Hawaii), to coagulase positive, Beta hemolytic, penicillin resistant Staphylococcus aureus. Several other parameters were measured and correlated with the progression of disease processes, from the collection date through adjustments to captivity.

Application of new technology in stress assessment, epidemiology and immunology of marine mammals was important in health management decisions for these newly captured dolphins.