

MONITORING THE HEALTH STATUS OF THE CALIFORNIA SEA LION (*Zalophus californianus*) USING A CANINE MICROARRAY.

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California sea lions (*Zalophus californianus*) are a marine mammal species susceptible to a variety of stressors, including marine toxins, infectious diseases, malnutrition, and oil spills. These stressors can greatly affect the health of the animals. Traditional methods of diagnosis and health assessment involve veterinary examination and standard blood chemistry measurements. Approaches that can more accurately diagnose and monitor the condition of sea lion health in stranded and recuperating animals are needed. A canine microarray (Agilent Technologies) is being tested to determine if the array can be used to diagnose and monitor the health of the sea lion. The canine microarray was chosen because the dog is the closest relative to the sea lion for which a sequenced genome and a commercial microarray are available. We hypothesize that sea lion RNA will hybridize to the dog microarray with sufficient affinity to make the canine microarray a useful tool for distinguishing the transcriptomic profiles of various tissues and between exposures to various stressors. In order to test the canine microarray, total RNA was isolated from blood, bone marrow, brain, liver and kidney from sea lions exposed to domoic acid, a marine biotoxin, and from sea lions without documented domoic acid exposure. These are all potential target organs for the impact of known stressors in the sea lions' environment. RNA was labeled with Cy3 and Cy5 dyes and hybridized to a 4x44k canine oligonucleotide array. We observed that sea lion RNA from blood, bone marrow, brain, kidney, or liver hybridized with 30-40% efficiency to the canine microarray. In addition, we observed that the gene expression patterns of the various tissues could be distinguished using this array. The results are being analyzed to determine which dog genes are informative of gene expression in the sea lion. The canine microarray will be redesigned in light of these findings and used to test its effectiveness as a diagnostic and prognostic tool for sea lion health.

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