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## EXHIBIT A: EXECUTIVE SUMMARY

The proposed project directly addresses priority research detailed by the Delta Science Program to protect native fishes that depend on the Bay-Delta system; &#8220;Topic 1: Native Fish Biology and Ecology&#8221; focusing on &#8220;adaptations&#8221; to local habitats and physiological tolerances to key environmental stressors&#8221; in delta smelt (*Hypomesus transpacificus*). Temperature and salinity changes associated with anthropogenic climate change are likely to further exacerbate delta smelt population declines. We hypothesize that delta smelt tolerance to forecasted temperature rises and salinity intrusions into the Bay-Delta system can be assessed at a mechanistic level, and that acclimation thresholds can be established by means of genomic responses. This proposal builds upon successful development of a cDNA microarray for delta smelt containing approximately 2000 individual gene fragments, and the subsequent application of biomarkers for assessing the effects of chemical stressors on larval development with links to swimming behavior. We propose to develop a &#8220;Next Generation&#8221; oligonucleotide microarray in delta smelt, with ca. 15K genes, in order to assess mechanistic tolerance to changes in temperature and salinity. Genomic studies will be conducted integrating effects on energetic activity and swimming performance studies, in an interdisciplinary approach that will permit the establishment of links between tolerance mechanisms and adverse outcomes.