

EXECUTIVE SUMMARY [NON-CONFIDENTIAL, NON-TECHNICAL ABSTRACT FOR PUBLIC INFORMATION OR PROGRAM PROMOTION]: State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project relevant to California. Do not include proprietary or confidential information. This may be distributed before the funding decision has been finalized.

The gray whale carries large populations of crustacean ectoparasites, including at least three species of highly specialized amphipod crustaceans known as "whale lice" and one species of "whale barnacle". We will take advantage of this unique host-parasite system to better understand how differences in population size and important life-history traits, such as body size, population size, and reproductive mode, influence the rate of molecular evolution in DNA. In addition, because these ectoparasites have shared a long evolutionary history with gray whales, we can actually use information in the genes of the latter to infer the contemporary population genetic structure and long-term population history of gray whales. This has important implications for the conservation of gray whales, which are difficult to study directly. This study is an example of how a unique host-parasite system can be used to answer fundamental question in molecular biology and evolution, while at the same time providing valuable insights into conservation and biodiversity. This is particularly relevant to California because (1) it will train students in cutting-edge molecular and bioinformatic techniques, (2) it will provide new information on the biodiversity of crustaceans found in our coastal waters, and (3) it will provide new information on the population structure and history of the gray whale, one of our most charismatic mammals.