The Genome of the Beluga Whale (Delphinapterus leucas).

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The beluga whale is a cetacean that inhabits arctic and subarctic regions, and is the only living member of the genus Delphinapterus. The genome of the beluga whale was determined using DNA sequencing approaches that employed both microfluidic partitioning library and non-partitioned library construction. The former allowed for the construction of a highly contiguous assembly with a scaffold N50 length of over 19 Mbp and total reconstruction of 2.32 Gbp. To aid our understanding of the functional elements, transcriptome data was also derived from brain, duodenum, heart, lung, spleen, and liver tissue. Assembled sequence and all of the underlying sequence data are available at the National Center for Biotechnology Information (NCBI) under the Bioproject accession number PRJNA360851A.

REFERENCE RANGES AND AGE-RELATED AND DIVING EXERCISE EFFECTS ON HEMATOLOGY AND SERUM CHEMISTRY OF FEMALE STELLER SEA LIONS (EUMETOPIAS JUBATUS).

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Abstract: Decreased health may have lowered the birth and survival rates of Steller sea lions (Eumetopias jubatus) in the Gulf of Alaska and Aleutian Islands over the past 30 yr. Reference ranges for clinical hematology and serum chemistry parameters needed to assess the health of wild sea lion populations are limited. Here, blood parameters were serially measured in 12 captive female Steller sea lions ranging in age from 3 wk to 16 yr to establish baseline values and investigate age-related changes. Whether diving activity affects hematology parameters in animals swimming in the ocean compared with animals in a traditional aquarium setting was also examined. Almost all blood parameters measured exhibited significant changes with age. Many of the age-related changes reflected developmental life history changes, including a change in diet during weaning, an improvement of diving capacity, and the maturity of the immune system. Mean corpuscular hemoglobin and mean corpuscular volume were also higher in the ocean diving group compared with the aquarium group, likely reflecting responses to increased exercise regimes. These data provide ranges of hematology and serum chemistry values needed to evaluate and compare the health and nutritional status of captive and wild Steller sea lions.
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Streptococcus phocae is a pathogen of marine mammals, although its pathogenicity remains poorly understood. Recovery of this bacterium from asymptomatic carriers suggests that it is an opportunistic pathogen. We investigated the role of S. phocae in naturally occurring disease and its significance as a pathogen based on postmortem investigations. Between 2007 and 2012, 1,696 whole carcasses, tissue samples, or both were submitted from the northeastern Pacific and Arctic Canada for diagnostic testing. Streptococcus phocae was cultured from phocids (n=66), otariids (n=12), harbor porpoises (Phocoena phocoena; n=5), and sea otters (Enhydra lutris; n=2). Pathologic manifestations of S. phocae-associated disease included localized, as well as systemic, inflammatory lesions with common findings of suppurative bronchopneumonia (n=17) and bacteremia (n=27). Lung lesions were frequently culture-positive for S. phocae, suggesting commensal colonization of the oropharynx with subsequent opportunistic infection of the respiratory tract during tissue injury, coinfection, immunosuppression, or other debilitating conditions. The presence of a positive spleen culture, and interpretations at necropsy and histopathology, were used to determine the presence of S. phocae bacteremia. Less frequent lesions that were culture positive for S. phocae included abscesses (n=9), meningitis (n=7), and cellulitis (n=1). The majority of cases with S. phocae lesions featured pre-existing conditions that presumably contributed to some degree of debilitation or immunosuppression, including emaciation (n=29), liver mercury accumulation (n=29), trauma (n=22), severe pulmonary or cardiovascular nematodiasis (n=9), concurrent bacterial or viral infections (n=8), or sarcocystosis (n=6). These findings suggest that S. phocae could be characterized as an opportunistic pathogen, associated with debilitating conditions in stranded and rehabilitating marine mammals. Wildlife investigators can use these results to draw more definitive conclusions regarding positive S. phocae cultures during postmortem studies in marine mammals.
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