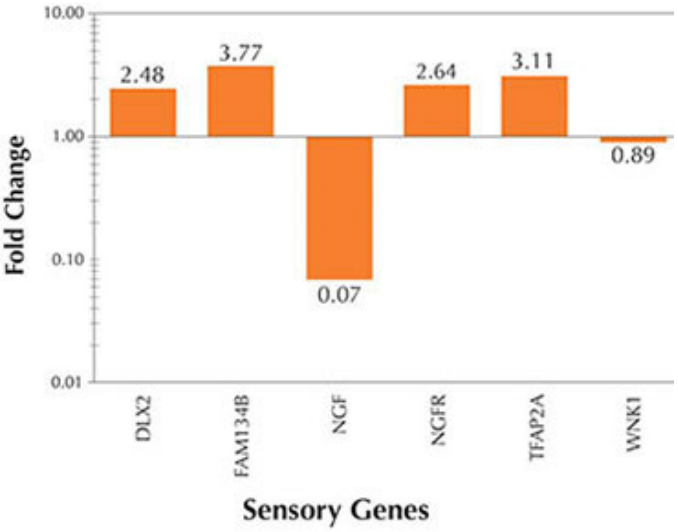
# Genetics

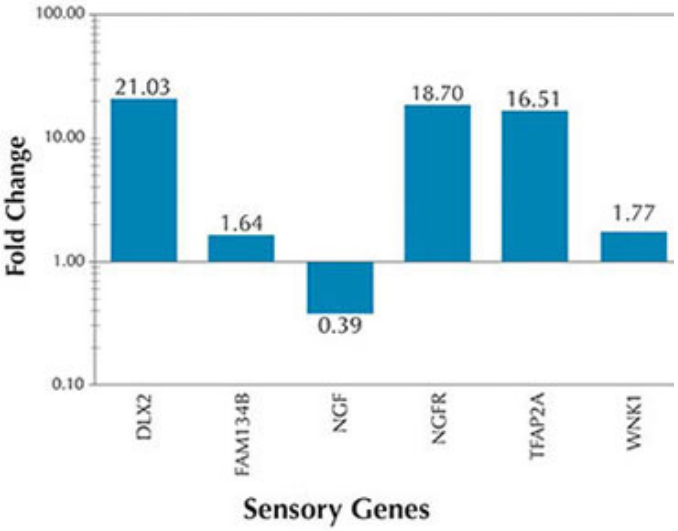
Since the narwhal has not been sequenced, a query of keywords “tooth” and “nerve” for the Tursiops truncatus genome was performed using the Ensembl database. The following genes – NGFR, DLX2, TFAP2A and GLI3 – were the only genes that resulted from the search. Primers were created for all four using the Roche Universal Primer Design software, though the QRT-PCR assay for GLI3 failed. Another approach to identifying additional sensory genes was based on the human genome; FAM134B and WNK1 (formerly HSN2) genes have been shown to be involved in hereditary sensory neuropathy type II, which has a pathology for the reduction or loss of the sensory perception of pain, temperature and touch (Kurth 2010). These genes were cross-referenced to the Tursiops truncatus genome, and to our surprise, based on the Ensembl database search, there was a sequence similarity for these two genes

The sensory and housekeeping genes were designed based on the Tursiops truncatus and Stenella coeruleoalba genomes, respectively. The Ensembl database (uswest.ensembl.org) was utilized to project transcripts involved in sensory nerve functions by using the closest relative of the narwhal whose genome had been sequenced (Tursiops truncates [Database version: 71.1]) (Hubbard et al., 2002; Flicek et al., 2012). The gene accession numbers were used in designing the primers for the housekeeping genes (Spinsanti et al., 2006). The Roche Universal ProbeLibrary probes and target-specific PCR primers were selected using the ProbeFinder Assay Design software (Rozen and Skaletsky, 2002; Kuo et al., 2006).

*The Sensory Genes tables at right are reproduced courtesy of The Anatomical Record.*




*Fold-change of sensory genes when compared to mandibular soft tissue.*




*Fold-change of sensory genes when compared to muscle tissue.*

2000-2017 ALL RIGHTS RESERVED, NARWHAL.ORG | SPRING NARWHAL ICE PHOTOGRAPHS, GLENN WILLIAMS
LANDSCAPE, EXPEDITION AND RESEARCH PHOTOGRAPHS, JOSEPH MEEHAN | ILLUSTRATIONS, KEVIN HAND