The bowhead whale is estimated to live over 200 years and is possibly the longest-living mammal. These animals should possess protective molecular adaptations relevant to age-related disease, particularly cancer. Here, we report the sequencing and comparative analysis of the bowhead whale genome and two transcriptomes* from different populations. Our analysis ....

- Identifies bowhead-specific genes (in the DNA) that are linked to cancer resistance and longevity.
- Expands our understanding of longevity in mammals and genetic changes providing cancer resistance.
- Finds other changes in genes related to thermoregulation, sensory perception, dietary adaptations, and the immune response.

*Transcriptomes are the collection of RNA molecules coded for by the genome, the molecules that are used to make proteins for cell regulation, structure and function. Unlike DNA, the RNA differs among tissues depending on which genes are activated for the tissue-specific function.

Inuit bowhead whale hunters know well that bowheads live a very long time. Traditional knowledge suggests “two human lifetimes.” Science documented this TEK with the DWM bowhead genetics program while monitoring the genetic diversity of the BCB stock. However, we did not know why they live so long or why they seem to be so ‘healthy’. This new research is helping to discover the genetic basis of bowhead health and longevity which is tied to the genetic “health” of the population.

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For more information, see the full article: Keane et al. 2015. Insights into the evolution of longevity from the bowhead whale genome. Cell Reports 10:112-122. http://dx.doi.org/10.1016/j.celrep.2014.12.008