

Scientists sequence genome of bowhead whale—longest-lived mammal

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Breathing holes of bowhead whale (*Balaena mysticetus*), Foxe Basin (Nunavut, Canada). Credit: Wikipedia/CC BY-SA 3.0

Scientists at the University of Liverpool have sequenced the genome of the bowhead whale, estimated to live for more than 200 years with low incidence of disease.

Published in the journal *Cell Reports*, the research could offer new insight into how animals and humans could achieve a long and healthy

life.

Scientists compared the genome with those from other shorter-lived mammals to discover [genetic differences](#) unique to the bowhead whale.

It is thought that large mammals, such as [whales](#), with over 1000 times more cells than humans, have a lower risk of developing cancer, suggesting that these creatures have natural mechanisms that can suppress disease more effectively than those of other animals.

Sequencing of the bowhead whale showed changes in genetic information that related to cell division, DNA repair, disease and ageing that with further analysis, could help inform future studies in longevity and cancer resistance.

Dr João Pedro de Magalhães, from the University of Liverpool's Institute of Integrative Biology, explains: "Our understanding of species' differences in longevity is very poor, and thus our findings provide novel candidate genes for future studies.

"We believe that different species evolved different 'tricks' to have a long lifespan, and by discovering those used by the bowhead whale we may be able to apply these findings to humans in order to fight age-related diseases."

The research may also provide clues into why there is significant variance in the size of some mammals.

Dr Magalhães added: "The bowhead's genome is the first among large whales to be sequenced, so this new information may help reveal physiological adaptations related to size that we have not been able to study in any great detail before.

"Whale cells have a much lower metabolic rate than those of smaller mammals, and we found changes in one specific gene involved in thermoregulation (UCP1) that may be related to metabolic differences in whale cells. This might allow us to see how and why [bowhead whales](#) and other similar creatures have sustained such an enormous size."

More information: *Cell Reports*, Keane et al.: "Insights into the evolution of longevity from the bowhead whale genome"

[www.cell.com/cell-reports/abstract ... 2211-1247\(14\)01019-5](http://www.cell.com/cell-reports/abstract/S2211-1247(14)01019-5)

Provided by University of Liverpool

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