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## Narwhals beat the death sentence of low genetic diversity

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Low genetic diversity—often brought on by a mass die-off or inbreeding—has been considered a death knell for species from heath hens to Tasmanian tigers. Without lots of genetic material to reshuffle, future generations are less able to adapt to changing environmental conditions. Now, a new genetic analysis of narwhals is turning that notion on its head: Despite low genetic diversity, these “unicorns” of the ocean seem to be doing just fine.

Narwhals, medium-size whales that live in the Arctic, are known for some genetic quirks. After multiple studies uncovered low genetic diversity in several narwhal genes, a team of researchers decided to analyze the whale’s entire genome. Using DNA from the frozen liver tissue of a narwhal found near Greenland, they calculated the genetic variation of the species and estimated the population size of narwhals into the deep past.

Their results reveal **a profound lack of diversity across the narwhal’s genome**, they report today in *iScience*. Compared with 14 other mammal species, narwhals were far less genetically diverse. For example, bowhead whales have twice as much variation, while pandas’ genomes are more than three times as diverse. What’s more, the team found no evidence of an inbreeding or die-off “bottleneck.” Instead, narwhal populations appear to have declined slowly starting 2 million years ago and have maintained a low genetic diversity for the past million years. Such slowly shrinking diversity has been seen in **mountain gorillas** and **Channel Island foxes**, but this time, the common culprits of inbreeding and isolation don’t appear to be to blame.

The narwhal’s abundance—there are more than 170,000 living in the wild—may come from a population explosion driven by favorable environmental conditions 115,000 years ago. Since then, genetic diversity may simply have not had enough time to catch up. But the researchers note that the narwhal isn’t totally out of the woods; with a range restricted to the rapidly warming Arctic, it’s unclear whether the narwhal’s uniform genome will be able to cope with ongoing climate change.

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