New Study Finds Genes Linked to Whales’ Huge Size

新研究发现与鲸鱼巨大体型相关的基因

Scientists have wondered long on the mystery of how whales got so big. A new study suggests some answers.

长期以来，科学家们一直想知道鲸鱼是如何长得这么大的谜团。一项新的研究给出了一些答案。

Whales are ocean animals. The fin, bowhead, gray, humpback and sperm whales are the largest animals living today. In fact, the blue whale is the largest animal known to have ever existed, bigger than any dinosaur.

鲸鱼是海洋动物。鳍鲸、弓头鲸、灰鲸、座头鲸和抹香鲸是当今最大的动物。事实上，蓝鲸是已知存在过的最大动物，比任何恐龙都大。

The recent study by researchers in Brazil found that four genes appear to play a big part in whales' huge size, a condition known as gigantism. The researchers said the four genes appear to have produced great size while easing the problems linked with it, such as cancer risk and lower reproductive ability.

巴西研究人员最近的研究发现，四种基因似乎在鲸鱼的巨大体型中发挥了重要作用，这种情况被称为巨人症。研究人员说，这四个基因似乎产生了巨大的体型，同时缓解了与之相关的问题，例如癌症风险和较低的生殖能力。

Whales are part of the ocean animal family called Cetaceans, which includes dolphins and porpoises. Scientists think the family developed 50 million years ago from animals like wolves, but is also related to today's cows, pigs, sheep and similar animals.

鲸鱼是称为鲸类动物的海洋动物家族的一部分，其中包括海豚和鼠海豚。科学家们认为，这个家族在 5000 万年前从狼等动物进化而来，但也与今天的牛、猪、羊和类似动物有亲缘关系。

Mariana Nery, a genetics expert with the University of Campinas (UNICAMP) in Brazil, was a lead writer of the report. It appeared in the publication Scientific Reports. Nery said her team has done the first study of gigantism in whales at the molecular level. She said, "Body size is a complex result of many genes, pathways, and physical and ecological processes."

巴西坎皮纳斯大学 (UNICAMP) 的遗传学专家 Mariana Nery 是该报告的主要作者。它出现在出版物科学报告中。Nery 说，她的团队首次在分子水平上对鲸鱼的巨人症进行了研究。她说，“身体大小是许多基因、通路以及物理和生态过程的复杂结果。”

The study examined seven kinds of whales that grow longer than 10 meters. Six of them are toothless animals. Instead, they have structures called baleen in their mouths that catch very small animals. The seventh species studied was the sperm whale, which has large teeth to feed on giant squid and ocean animals.

该研究检查了七种体长超过 10 米的鲸鱼。其中六只是没有牙齿的动物。相反，它们的嘴里有一种叫做鲸须的结构，可以捕捉非常小的动物。研究的第七个物种是抹香鲸，它有大牙齿，可以捕食巨型乌贼和海洋动物。

The whales can reach huge sizes. Humpback and right whales can reach 15 meters in length; the sperm and bowhead whales, 18 meters; the fin whale can reach 24 meters, and the biggest, the blue whale, has been measured at 30 meters.

鲸鱼可以达到巨大的尺寸。座头鲸和露脊鲸身长可达15米；抹香鲸和弓头鲸，18 米；长须鲸可达 24 米，最大的蓝鲸可达 30 米。

The researchers studied several genes linked to increased body size in other animals. They found four genes that appeared to be important in the development of whales.

研究人员研究了几个与其他动物体型增加有关的基因。他们发现了四种似乎对鲸鱼发育很重要的基因。

One of the genes is GHSR. It is involved in releasing growth hormone from the pituitary gland, a part of the body that releases important chemicals. Growth hormone can cause hunger and it can control metabolism and the growth of fat. The gene also controls cell division.

其中一个基因是 GHSR。它参与从脑垂体释放生长激素，脑垂体是释放重要化学物质的身体的一部分。生长激素可以引起饥饿感，它可以控制新陈代谢和脂肪的生长。该基因还控制细胞分裂。

A second gene is called IGFBP7. This gene is involved in cell growth and division. There is evidence that this gene acts to suppress cancer in many parts of the body including the prostate, breasts, lungs, colon and rectum.

第二个基因称为 IGFBP7。该基因参与细胞生长和分裂。有证据表明，该基因可以抑制身体许多部位的癌症，包括前列腺、乳房、肺、结肠和直肠。

NCAPG is a gene associated with growth in humans, horses, cattle, pigs and chickens. It can cause size and weight gain and affects the lives of cells.

NCAPG 是一种与人类、马、牛、猪和鸡的生长有关的基因。它会导致体型和体重增加，并影响细胞的生命。

The gene PLAG1 is associated with body growth in cows, pigs and sheep. It is involved in the growth of embryos and cell survival.

PLAG1 基因与牛、猪和羊的身体生长有关。它参与胚胎的生长和细胞存活。

The study also suggests that the genes such as GHSR and IGFBP7, which are linked to huge size, might also control cell development and suppress cancer. Huge size in nature is tied to shorter lifespans. But huge whales live long lives. The humpback whale can reach 50 years of age. The blue whale can reach 90 and, the study noted, the bowhead whale is the longest-lived mammal known, reaching 200 years of age.

该研究还表明，与巨大尺寸相关的 GHSR 和 IGFBP7 等基因也可能控制细胞发育并抑制癌症。自然界的巨大尺寸与较短的寿命有关。但是巨鲸的寿命很长。座头鲸可以活到50岁。蓝鲸可以活到 90 岁，研究指出，弓头鲸是已知最长寿的哺乳动物，可以活到 200 岁。

Felipe Andre Silva was lead writer of the study. He worked on the research while earning his master's degree in genetics and molecular biology.

费利佩·安德烈·席尔瓦 (Felipe Andre Silva) 是该研究的主要作者。他在获得遗传学和分子生物学硕士学位的同时从事这项研究。

He said gigantism in whales appeared relatively recently, around 5 million years ago. "Before that there were animals with large sizes…but these were exceptions, and most cetaceans did not exceed 10 meters in length," he said.

他说，鲸鱼的巨人症出现时间相对较晚，大约在 500 万年前。“在那之前，有体型较大的动物……但这些都是例外，大多数鲸类动物的长度不超过10 米，”他说。

Silva told Reuters news agency: "Gigantism may bring some advantages such as a lower chance of being preyed upon and a greater change of obtaining food."

席尔瓦告诉路透社：“巨人症可能会带来一些优势，比如被捕食的几率较低，获取食物的方式也比较多。”

Nery said a lot can be learned about the development, or evolution, of whales over long periods of time. She said, "These animals can teach us a lot about the evolutionary process itself." And whales remain popular and interesting to many people and gain a lot of attention. Nery added, "The evolution of cetaceans is a fantastic story…"

Nery 说，在很长一段时间内，关于鲸鱼的发展或进化可以学到很多东西。她说，“这些动物可以教会我们很多关于进化过程本身的知识。” 鲸鱼对许多人来说仍然很受欢迎和有趣，并引起了很多关注。Nery 补充道，“鲸类动物的进化是一个奇妙的故事……”