Great White Shark's DNA Could Be Key to Cancer Cure

The massive marine animal's super healing powers hold promise, say researchers.

February 27, 2019 By Casey Halter

As researchers continue to chase down a cure for cancer, some are taking their investigations outside the lab and into the natural world. Consider the new research published in the Proceedings of the National Academy of Sciences (PNAS) that suggests the DNA of great white sharks could lead scientists to a cure for cancer.

Researchers at the Save Our Seas Shark Research Center at Florida's Nova Southeastern University's in Dania Beach, shared findings from the first genetic map of great white sharks' DNA—revealing characteristics that seem to protect the animal against cancer and other age-related illnesses.

As the BBC reports, scientists acted on a hypothesis that since sharks have inhabited Earth for so long—at least 16 million years, marine biologists theorize—they have evolved such that their DNA can repair itself and is more tolerant to damage. Indeed, sharks are known to recover from serious wounds in a matter of weeks, sometimes days, baffling fishermen and marine biologists alike. Humans, on the other hand, have relatively new DNA in the evolutionary scheme of things, which, many people believe, renders us vulnerable to age- and mutation-related diseases such as cancer.

So what's in shark DNA that makes them so resilient? Researchers discovered gene sequences that code for super-effective blood-clotting agents as well as boosted scaffolding proteins responsible for the regeneration of new tissue and flesh. The new gene map also shows that sharks possess code for genome-stabilizing DNA repair mechanisms and tumor suppression. The result? A massive body size and relatively long life span (both ordinarily recipes for dangerous mutations) with a much lower risk of cancer than humans.

"Genome instability is a very important issue in many serious human diseases," said study co-leader Mahmoud Shivji, PhD. "Now we find that nature has developed clever strategies to maintain the stability of genomes in these large-bodied, long-lived sharks."

Moving forward, researchers hope to splice shark genes into transgenic mice that will be exposed to known carcinogens and monitored to measure the potential protective powers of shark DNA. The study's authors and colleagues from Cornell University College of Veterinary Medicine, the

Monterey Bay Aquarium and others hope the study will also help draw attention to the conservation of great white and other sharks, which have been rapidly declining in population as a result of hunting and overfishing.

Finally, scientists stress that it will be many years before this research aids in the development of cancer drugs and warn folks that the consumption of shark products in the meantime is of no benefit whatsoever.
