

Marine organisms with eternal life can solve the riddle of aging

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Animals that reproduce asexually by somatic cloning have special mechanisms that delay ageing provide exceptionally good health. Scientists at the University of Gothenburg have shown how colony-forming ascidians (or sea squirts) can activate the enzyme telomerase, which protects DNA. This enzyme is more active also in humans who attain an advanced age.

"[Animals](#) that clone themselves, in which part of an individual's body is passes on to the next generations, have particularly interesting conditions related to remaining in good health to persist. This makes it useful to study these animals in order to understand mechanisms of ageing in humans", says Helen Nilsson Sköld of the Department of Marine Ecology, University of Gothenburg.

There are enormous differences in the lengths of life of the Earth's species. Some animals and plants that reproduce asexually can in principle achieve essentially eternal life; there are examples of deep-sea corals that are tens of thousands of years old. Helen Nilsson Sköld has decided to study sea squirts and starfish, which are species whose genes resemble closely those of humans.

"My research has shown that [sea squirts](#) rejuvenate themselves by activating the enzyme telomerase, and in this way extending their chromosomes and protecting their [DNA](#). They also have a special ability to discard 'junk' from their cells. Older parts of the animal are quite simply broken down, and are then partially recycled when new and

healthy parts grow out from the adult bodies."

Some species of starfish reproduce asexually by tearing apart their bodies, while others reproduce sexually only. This makes them particularly interesting animals to study. Both types of starfish can reconstruct lost body parts, but the species that reproduce asexually have considerably better health.

However, one consequence of asexual reproduction is that the species as a whole will have a very low genetic variation. This means that they will be particularly vulnerable to climate change, and the subsequent new types of changes in the environment. There is a high risk that these animals and plants will loose out – and then we will loose important knowledge about the riddle of ageing.

Provided by University of Gothenburg

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