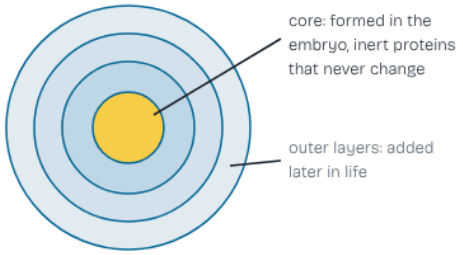
That is why

Why do Greenland sharks live for centuries?

A body that runs slowly in icy water and extra DNA repair genes; the proof of their age is sealed in the eye.

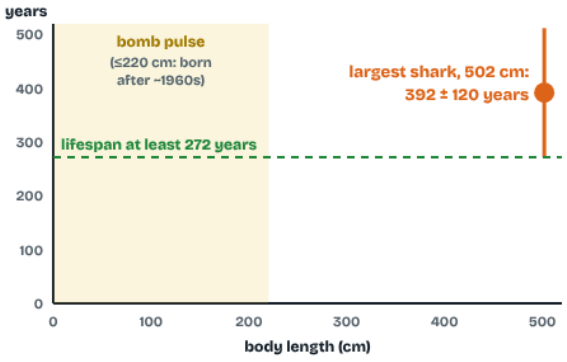
A Reading the age in the eye

Lens core = a time capsule



Backbones too soft for growth rings, so the eye holds the clue.

Body length vs estimated age (28 females)



B A life in slow motion

Cruising speed (6 tagged sharks)

0.34 m/s, about 1.2 km/h

One tail beat about every 7 seconds (0.15 Hz): the lowest for its size of any fish measured.

Grows less than 1 cm a year:

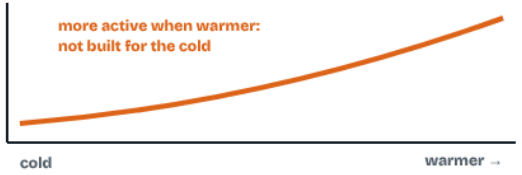


a whole century of growth: less than 1 meter

Maturity at about 156 ± 22 years.

Muscle tests (University of Manchester)

Enzyme activity vs water temperature



Young vs old sharks:

no real change in muscle energy use with age, unlike most animals. Schematic curve.

C A genome full of repairs

Genome size (base pairs)



Twice as long as ours; over 70% is "jumping genes" (transposable elements).

The repair crew



DNA is damaged thousands of times a day in every cell. A change in p53, the "guardian of the genome", too.

p53 is broken in about half of all human cancers. The team says more studies are needed to know how much these genes explain the long life.

Like a classic car: driven gently and constantly repaired, it keeps running for a century and more.

Free for learning thatiswhy.com

Free for learning, teaching and research. Please credit: That Is Why, thatiswhy.com

Diagram: https://thatiswhy.com/diagrams/why-greenland-sharks-live-long/ · Full guide: /why-greenland-sharks-live-for-centuries/