

Anti-Aging: State of the Art

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Is aging necessary?

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Animals that don't age

- hydra (biologically immortal) [Martinez(1998)]
- naked mole rats [Ruby and Smith(2018)]
- tortoises [Miller(2001)]
- some sharks [Pennisi(2016)]
- some clams [Munro and Blier(2012)]

Objection: but it's natural
(or: there is no way it could work)

Examples of old animals:

- sharks
- moles
- others
- and many more

Conclusion: it's not natural

Studies with Mice

and how much life got extended: living twice as long QUALY is possible



Daniel E Martinez.

Mortality patterns suggest lack of senescence in hydra.

Experimental gerontology, 33(3):217–225, 1998.



JK Miller.

Escaping senescence: demographic data from the three-toed box turtle (*terrapene carolina triunguis*).

Experimental Gerontology, 36(4-6):829–832, 2001.

Sources ii



Daniel Munro and Pierre U Blier.

The extreme longevity of *arctica islandica* is associated with increased peroxidation resistance in mitochondrial membranes.

Aging cell, 11(5):845–855, 2012.



Elizabeth Pennisi.

Greenland shark may live 400 years, smashing longevity record — science — aaas.

https://www.sciencemag.org/news/2016/08/
greenland-shark-may-live-400-years-smashing-longevi
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-By%20Elizabeth%20Pennisi&text=Imagine%
20having%20to%20wait%20a,by%20at%20least%20a%
20century., 08 2016.
(Accessed on 2021-05-24).



J Graham Ruby and Megan Smith.

Naked mole-rat mortality rates defy gompertzian laws by not increasing with age.

elif, 7:e31157, 2018.