

THE IMMORTAL (like Highlander)

You may have heard of the Hydra (*Hydrozoa*) as one of the few organisms often described as “immortal,” making it a fascinating focus for research on aging. A recent study by Sahm et al. (1) sheds light on this intriguing creature.

Notably, Hydra’s so-called “immortality” has been observed only in an individual taken into the lab in 1973 and maintained under controlled conditions. Thanks to its high stem cell turnover and exceptional regenerative abilities, it has shown no signs of aging in this environment. However, the story is quite different in nature, where Hydra faces significant external threats, including predation and environmental stress, limiting its lifespan to just a few weeks. This indicates that its extraordinary longevity in the lab is not an adaptation for survival in the wild but rather a consequence of idealized conditions.

The study also challenges the theory that aging is primarily driven by the accumulation of somatic mutations. Interestingly, Hydra exhibits a mutation rate slightly higher than that of humans, raising questions about the assumed link between low mutation rates and longevity. On the contrary, these mutations may have contributed to Hydra’s adaptability. The authors were able to show that some mutations have undergone strong positive selection since its cultivation began 50 years ago.

Lastly, it’s worth noting that lab-maintained Hydra reproduce asexually, whereas in the wild, Hydra switches to sexual reproduction under stressful conditions.

1. <https://genome.cshlp.org/content/early/2024/12/04/gr.279025.124>