

Macro Roundup Article

Headline: [Animal Mutation Rates Reveal Traits That Speed Evolution](#)

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Tweet: [. @QuantaMagazine reports on a @Nature study that tracked the tempo of evolution across 68 species and found that the mutation rate per year was higher than expected.](#)

Summary: A massive analysis of 68 diverse vertebrate species, from lizards and penguins to humans and whales, has made the first large-scale comparison of the rates at which species mutate — a first step toward understanding how quickly they can evolve. The findings, published in the journal *Nature*, unearthed surprising insights into how the tempo for mutations can change and what sets that pace. The most surprising finding that emerged from the data was the wide range of germline mutation rates. When the researchers measured how often the mutations occurred per generation, the species varied by only about fortyfold. But when they looked at the mutation rates per year rather than per generation, the range increased to about 120-fold, which was larger than previous studies had suggested. The study authors found that the higher the average effective population size for a species, the lower its mutation rate. That provided good evidence for the “drift-barrier hypothesis” devised a little over a decade ago. “Selection is relentlessly trying to reduce the mutation rate because most mutations are deleterious,” Michael Lynch, an evolutionary biologist at Arizona State University explained. But in species with smaller effective population sizes, natural selection gets weaker because genetic drift—the effect of pure chance on the spread of a mutation—gets stronger. That allows the mutation rate to rise.

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