

## SUPPLEMENTARY TABLES

**Supplementary Table 1. Telomere length, rate of telomere shortening, lifespan, and DNA damage.**

Species	Telomere Length at Young Age (kb)	Rate of Telomere Shortening (bp/year)	Maximum Lifespan (years)	Average Lifespan	Rate of $\gamma$ H2AX increase (% positive cells/year)	Rate of increase of % short telomeres (%/year)
Goat ( <i>Capra hircus</i> )	10.4 [1]	363 [1]	20.8	16.5 [3]	0.668	0.218
Reindeer ( <i>Rangifer tarandus</i> )	19.8 [1]	531 [1]	21.8	15 [4–6]	1.24	0.947
Griffon vulture ( <i>Gyps fulvus</i> )	19.8 [1]	209 [1]	41.4	37 [5, 7]	0.472	0.451
Bottlenose dolphin ( <i>Tursiops truncatus</i> )	90.7 [1]	766 [1]	51.6	17 [8–11]	0.115	0.119
American flamingo ( <i>Phoenicopterus ruber</i> )	21.0 [1]	105 [1]	60	40 [12–17]	0.180	0.394

For each species in the study, the estimated initial telomere length (1), the rate of telomere shortening (1), the maximum lifespan, the average lifespan, the rate of DNA damage, and the rate of increase of % short telomeres is shown. The maximum lifespans were obtained from the AnAge database (2), and the average lifespans were obtained from various sources as referenced in the table.

**Supplementary Table 2. Data table used for multivariate linear regression.**

Species	Rate of $\gamma$ H2AX increase (% positive cells/year) (log)	Rate of increase of % short telomeres (%/year) (log)	Average lifespan (years) (log)	Maximum lifespan (years) (log)
Goat ( <i>Capra hircus</i> )	-0.175	0.314	1.22	1.32
Reindeer ( <i>Rangifer tarandus</i> )	0.0934	-0.02365	1.18	1.34
Griffon vulture ( <i>Gyps fulvus</i> )	-0.370	-0.346	1.57	1.62
Bottlenose dolphin ( <i>Tursiops truncatus</i> )	-0.939	-0.924	1.23	1.71
American flamingo ( <i>Phoenicopterus ruber</i> )	-0.745	-0.405	1.60	1.78

The log values of all of the datapoints were used for the regression. The input variables of rate of  $\gamma$ H2AX increase (% positive cells/year) and rate of increase of % short telomeres (%/year) were fit to either the average lifespan or the maximum species lifespan.

**Supplementary Table 3. Multivariate regression results for average lifespan.**

	<b>Estimate</b>	<b>Standard error</b>	<b>t-value</b>	<b>Pr(&gt; t )</b>
(Intercept)	1.27	0.193	6.57	0.0224 (*)
Rate of $\gamma$ H2AX increase (% positive cells/year) (log)	-0.283	0.590	-0.480	0.679
Rate of increase of % short telomeres (%/year) (log)	0.110	0.535	0.206	0.856

The estimate, standard error, t-value, and p-value of each variable is presented.

Residual standard error: 0.269 on 3 degrees of freedom

Multiple R-squared: 0.152, Adjusted R-squared: -0.695

F-statistic: 0.180 on 2 and 2 DF, p-value: 0.848

**Supplementary Table 4. Multivariate regression results for maximum lifespan.**

	<b>Estimate</b>	<b>Standard error</b>	<b>t-value</b>	<b>Pr(&gt; t )</b>
(Intercept)	1.38	0.0694	19.9	0.00252 (**)
Rate of $\gamma$ H2AX increase (% positive cells/year) (log)	-0.251	0.212	-1.18	0.358
Rate of increase of % short telomeres (%/year) (log)	-0.180	0.192	-0.938	0.447

The estimate, standard error, t-value, and p-value of each variable is presented.

Residual standard error: 0.0966 on 2 degrees of freedom

Multiple R-squared: 0.875, Adjusted R-squared: 0.750

F-statistic: 6.99 on 2 and 2 DF, p-value: 0.125