

Reply to Vilar *et al.*: Sleep or hide, better for survival anytime

Although Vilar *et al.* (1) found our results (2) interesting, they claimed that our explanation is flawed. Our primary purpose was to show, despite preservation biases in our fossil mammal dataset, that small mammals have a lower genus and species turnover rate than large mammals (2). Our dataset represents a range of habitats, from subtropical to temperate, and from closed to open, changing through both space and time (3–5). Given the same changing environmental backdrop over the same geologic time period, and given our clear result that small mammals as a group have lower turnover rates, we further suggested that there is a subset of long-lived small mammal taxa in our data that are possibly more buffered against environmental change because of their physiological-behavioral attributes [sleep or hide (SLOH)]. Because we could not directly observe these attributes, we used a “nearest relative approach” to infer the presence or absence of SLOH traits for all genera (both large and small) in our database, wherever this approach was applicable (2).

We agree that SLOH behaviors are probably much less likely to evolve in large mammals, but we stress that we made no claim that SLOH behaviors evolved as an adaptation to Miocene climate change. We suggested only that SLOH mammal taxa may survive with a greater probability under changing environments, especially where environmental fluctuation is a greater factor in survivorship, such as in the temperate

realm, compared with the tropical realm, where biotic interactions could be a relatively stronger factor in shaping survivorship. Our data were necessarily predominantly Palaearctic, but further testing our proposed ideas beyond this domain will certainly be fruitful.

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Author contributions: L.H.L., M.F., E.B., K.L., H.M., L.F., and N.C.S. wrote the paper. The authors declare no conflict of interest.

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