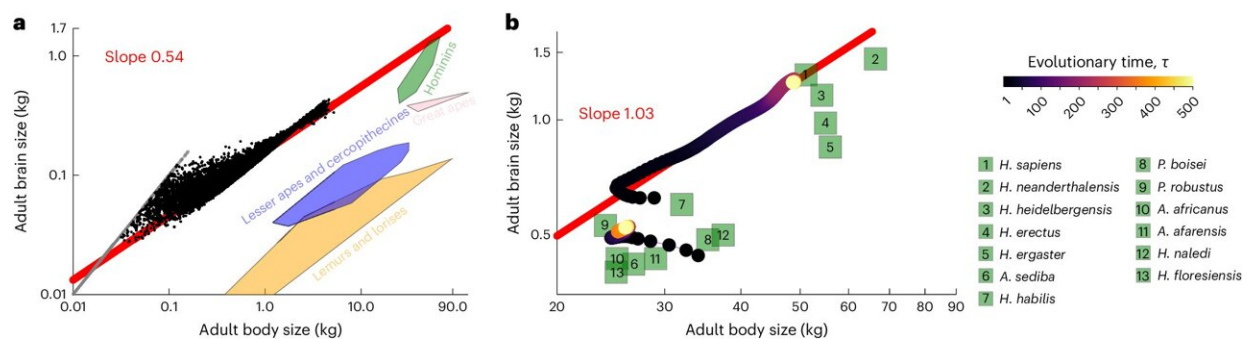


Evolutionary biologist suggests human brain grew as energy was freed from ovarian follicles

May 30 2024, by Bob Yirka



Brain–body allometries without and with evolution. a, Brain size at 40 years of age versus body size at 40 years of age on a log–log scale, developed under the brain model from 10^6 randomly sampled genotypes using the parameter values of the sapiens scenario. b, Brain size at 40 years of age versus body size at 40 years of age over evolutionary time on a log–log scale for two trajectories. The bottom trajectory uses the parameter values of the afarensis scenario and somewhatNaive2 ancestral genotypic traits. The top trajectory uses the parameter values of the sapiens scenario and the evolved genotypic traits of the bottom trajectory as ancestral genotypic traits. Credit: *Nature Human Behaviour* (2024). DOI: 10.1038/s41562-024-01887-8

Mauricio González-Forero, an evolutionary biologist at the University of St Andrews, in the U.K., is proposing a new theory to explain the massive growth of the human brain over its evolutionary history.

In his paper [published](#) in the journal *Nature Human Behavior*, he suggests that the [human brain](#) was primed to grow due to a variety of factors and only took off when energy previously used to maintain [ovarian follicles](#) was freed up, allowing the brain to use more than its prior share.

Over the years, many theories have been proposed to explain the growth of the human brain compared to that of early contemporaries such as the great apes. Many such theories revolve around humans descending from trees to become social foragers.

In more recent times, some have suggested that our brains grew larger as our intestines grew smaller, due to switching to a fermented diet, thereby freeing up resources.

González-Forero has previously proposed other theories, most of which involve changes to the body that freed up resources, resulting in changes to the way the body allocated [energy resources](#). In this new effort, he suggests that one such overlooked change might be the ovaries.

González-Forero began his study by noting that most theories seeking to explain brain growth have not been backed up by hard numbers. That led him to use mathematical tools to separate evolutionary adaption theories based on selection from those based on constraints that may have been holding back other adaptations. And that led him to human ovaries, or more specifically, to the number of ovarian follicles.

Ovarian follicles are spherical aggregations of cells found inside of the ovaries—they secrete hormones that control the phases of the menstrual cycle. By the time they reach puberty, most girls have between 200,000 and 300,000 follicles—each with the potential of releasing an egg cell.

González-Forero noted that as humans evolved, the energy needed to

maintain those follicles was reduced. And because humans still ate as much as they ever did, that freed up the energy for use as a resource by other [body parts](#) such as the brain.

In doing the math, González-Forero found that the amount of energy freed up from follicular maintenance roughly equaled the amount of energy increase needed for the human brain to grow to its current size. In his view, the brain was always ready to grow; it was simply held back by a lack of energy.

More information: Mauricio González-Forero, Evolutionary–developmental (evo-devo) dynamics of hominin brain size, *Nature Human Behaviour* (2024). [DOI: 10.1038/s41562-024-01887-8](https://doi.org/10.1038/s41562-024-01887-8)

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