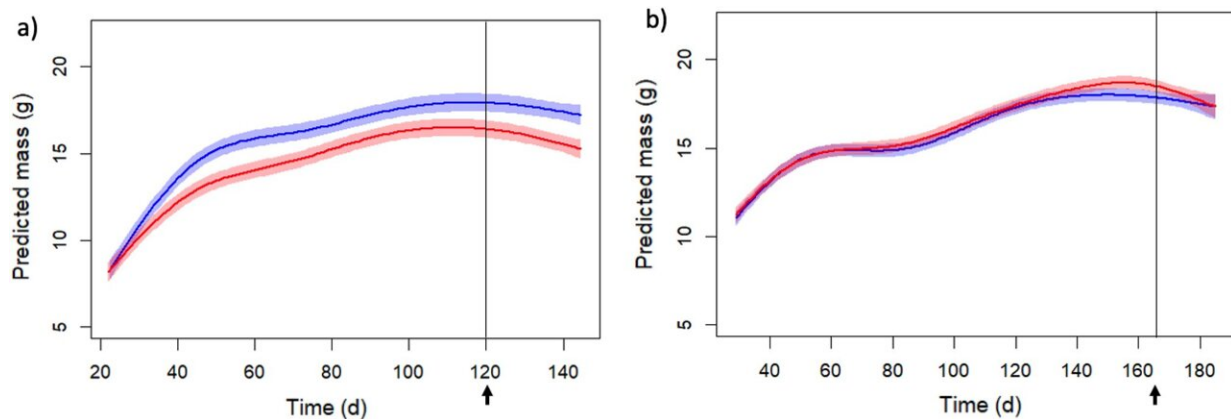


Female scent found to accelerate growth in juvenile male mice

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Changes in male body mass over time (age in days) showing the mean mass (continuous line) and 95% confidence intervals (shaded area) for males exposed to (a) female urine and (b) male urine (blue trend lines) compared to control male mice (red trend lines). Arrows and vertical lines show the mean day of the Salmonella challenges. Credit: *Scientific Reports* (2023). DOI: 10.1038/s41598-023-34548-3

Exposing female house mice (*Mus musculus*) to the scent of male urine is known to accelerate their sexual development in what scientists call the Vandenberg effect. A study recently published in *Scientific Reports* led by the University of Veterinary Medicine Vienna now shows that this effect works both ways. The study found that juvenile male mice grew significantly faster when exposed to female urinary scent.

In their study, the research team tested whether exposing juvenile male mice to female [urine](#) influences their growth and the size of their sexual organs. Three-week-old male house mice were exposed to female urine daily 5x/week for about 30 minutes over a period of three months. A [control group](#) was exposed to normal water only.

"We found that males exposed to females grew significantly faster and gained more body mass than control animals, despite all males being reared on the same amount of diet," says the study's first author, Sarah M. Zala of Vetmeduni's Konrad Lorenz Institute of Ethology, "but we detected no differences in males' [muscle mass](#) or sexual organs." Exposing juvenile males to male urine had no effect on their growth.

Last author Dustin J. Penn, also from the Konrad Lorenz Institute of Ethology, highlights the importance of the study, "Our results provide the first evidence to our knowledge that juvenile male mice accelerate their growth when exposed to the urine of adult females."

The researchers also tested whether the males' accelerated growth involved any functional trade-offs, where one benefit is given up in exchange for another, regarding the males' immune resistance to an experimental infection.

"We exposed juvenile male [mice](#) to a [bacterial pathogen](#) (Salmonella enterica) but found no evidence that increased growth had negative trade-offs on immune resistance to infectious disease," says Dustin J. Penn. "Bacterial clearance, [body mass](#) or survival during infection were no different when compared to the animals from the control group."

The exact mechanisms through which female urine triggers the accelerated growth response in males remains unclear, but an endocrine-mediated puberty acceleration seems conceivable. The new findings could prove useful for future studies aimed at influencing the growth or

sexual development of male animals using more natural methods.

According to the researchers, further studies are now needed to learn more about the mechanisms behind this effect. This would, for example, help to determine whether and how female urine exposure affects male growth and sexual development in a natural context.

More information: Sarah M. Zala et al, Female scent accelerates growth of juvenile male mice, *Scientific Reports* (2023). [DOI: 10.1038/s41598-023-34548-3](https://doi.org/10.1038/s41598-023-34548-3)

Provided by University of Veterinary Medicine—Vienna

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