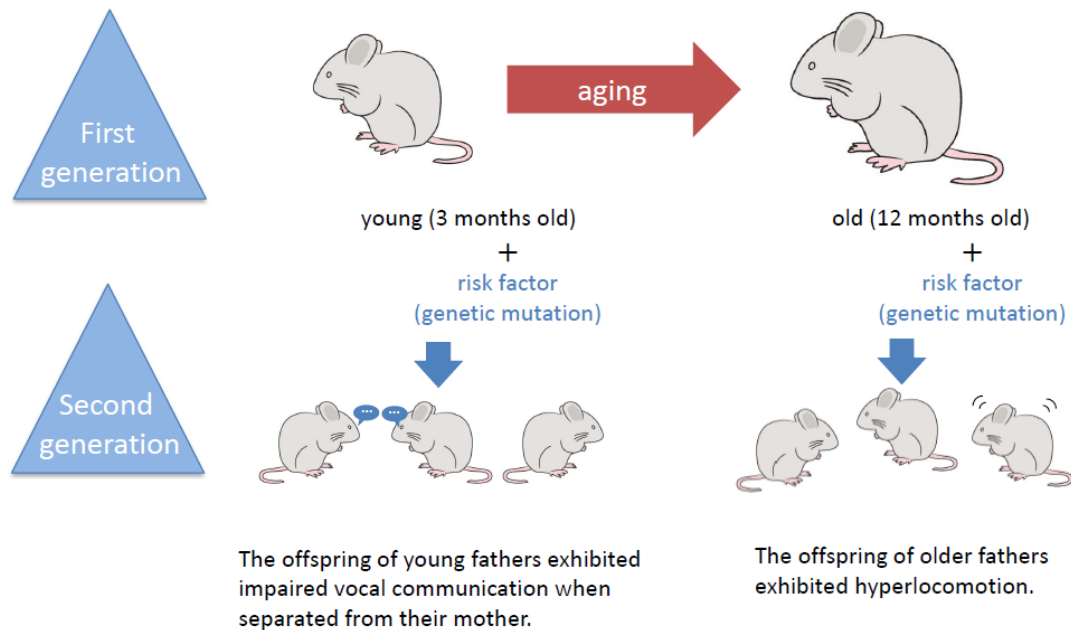


Paternal aging and its possible link to neurodevelopmental disorders

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Genetic risks may affect the behavior of the next generation, depending on the age of the father. Credit: Tohoku University Graduate School of Medicine

Neurodevelopmental disorders such as autism spectrum disorder (ASD) and attention deficit and hyperactivity disorder (ADHD) are on the rise but its underlying mechanisms are poorly understood.

Noriko Osumi, Kaichi Yoshizaki and colleagues at Tohoku University's Graduate School of Medicine collaborated with Shigeru Wakana and Tamio Furuse at RIKEN Bio-Resource Center, and Tucci Valter at Istituto Italiano di Tecnologia, to conduct comprehensive behavioral analyses on how paternal aging influences the behavior of offspring that inherit a genetic risk (a mutation in Pax6 gene).

In the experiments, in order to minimize the physical influence of the father, the male mouse was isolated and in vitro fertilization was used to impregnate the female. The researchers found that the offspring of young fathers exhibited impaired vocal communication, while the offspring of older fathers exhibited hyperlocomotion.

The results are significant for both animal researchers and the public. For researchers working on animal models, it shows that the age of male mice can influence the behavior of the offspring, so this should be a consideration when they are used to mate.

For the public, the research shows that paternal aging may exacerbate genetic risks - this could explain why there is a rapid rise in the ratio of children with ASD or ADHD, due to men having children later in life.

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More information: Kaichi Yoshizaki et al, Paternal Aging Affects Behavior in Pax6 Mutant Mice: A Gene/Environment Interaction in Understanding Neurodevelopmental Disorders, *PLOS ONE* (2016). [DOI: 10.1371/journal.pone.0166665](https://doi.org/10.1371/journal.pone.0166665)

Provided by Tohoku University

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