

Sex chromosomes of birds as reservoir for jumping genes

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Occurring in the genomes of most living organisms, transposable elements (TEs) are short DNA sequences that have the ability change their position. By means of various molecular mechanisms—so-called

copy-paste or cut-and-paste—they can 'jump' to another place within the genome. The genes contained in transposable elements are therefore known as jumping genes. Depending on the position into which they insert in the genome, this can have negative consequences for the host—the organism lending its genome which they inhabit. Host species thus evolved protection mechanisms to restrict the activity of TEs. However, TEs have found ways to circumvent these protection mechanisms.

The LMU biologists Vera Warmuth and Jochen Wolf have now been able to demonstrate that the sex chromosome of crows exhibits particularly high TE activity, meaning that the protection mechanisms are less effective in this chromosome than in other chromosomes. In birds, only females possess a sex-specific chromosome. Particularly high TE activity on sex-specific chromosomes had previously been identified only in the model organism *Drosophila melanogaster*—the fruit fly—where the sex chromosome occurs exclusively in males. In the fruit fly, uncontrolled TE activity on the sex chromosome accelerates the aging process of males. The scientists hypothesize that high TE activity on sex chromosomes could potentially have fitness consequences in female birds.

More information: Vera M Warmuth et al, Ineffective silencing of transposable elements on an avian W Chromosome, *Genome Research* (2022). [DOI: 10.1101/gr.275465.121](https://doi.org/10.1101/gr.275465.121)

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