

Sex is 'nothing but trouble', geneticist says

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(Phys.org) —Sex determining genes in marsupials have shed some light on how the Y chromosome, which determines the male sex in humans, will quickly degenerate and eventually disappear, according to a world-renowned evolutionary geneticist.

During a lecture tonight, hosted by the Australian Academy of Science, thinker-in-residence with the University of Canberra's Institute for Applied Ecology Jennifer Graves will describe how the map of the marsupial genome is unlocking genetic secrets with deep implications for human health.

"Sex is nothing but trouble... genetically," Professor Graves said. "The chromosome that carries the sex determining gene loses active genes, so this creates the problem that [males and females](#) have different dosages of genes. Males have only one copy of the [X chromosome](#), which contains more than a thousand genes, while Y has only 45 genes. If one of these is mutated, they have no backup."

Professor Graves is an evolutionary geneticist who works on Australian animals, including kangaroos and platypus, devils (Tasmanian) and dragons (lizards). Her research team uses their distant relationship to humans to discover how genes and chromosomes and regulatory systems evolved, and how they work in all animals including us humans.

Using [DNA sequences](#), her laboratory has been able to answer questions about what genes are on the [sex chromosomes](#) and how do they work as well as explore the origin, function and fate of [human sex](#) genes and

chromosomes, famously predicting that the [Y chromosome](#) will disappear in a few million years.

"You'd think something as important as sex wouldn't change much in evolution - but it's exactly the opposite," Professor Graves said. "The genes and chromosomes that control sex really self-destruct in a blink of an evolutionary eye. When a chromosome acquires a new sex determining gene, this is the kiss of death for the chromosome; it will degenerate quickly and inexorably."

In addition to being thinker-in-residence with the University's Institute for Applied Ecology Professor Graves is distinguished professor at the La Trobe Institute of Molecular Science, and ANU emeritus professor and University of Melbourne Professorial fellow.

Provided by University of Canberra

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