Sex chromosomes have reverted to autosomes multiple times in flies

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At the GSA Drosophila Research Conference, scientists will present evidence of many reversals of sex chromosome to autosomes in flies. They identified nine independently evolved sex chromosomes in a wider variety of fly species than had previously been examined and determined that these newly formed X-chromosomes have become dosage compensated, to balance the relative gene expression between males and females.

In previous research (Nature, July 2013), UC Berkeley scientists Beatriz Vicoso, Ph.D., and Doris Bachtrog, Ph.D., determined that genes on the so-called "dot chromosome," or fourth chromosome, of the fruit fly Drosophilia melanogaster are X-linked in three other related fly species.

These and other findings revealed that the fruit fly's "dot chromosome" had descended from a differentiated X chromosome and suggests that several of the chromosome's puzzling features are remnants of its heritage as a sex chromosome. For example, the expression levels of genes on the "dot chromosome" generally are higher in female than in male fly embryos during early development.

At the GSA *Drosophila* Research Conference, Drs. Vicoso and Bachtrog will present evidence of many reversals of sex chromosome to autosome in flies. They identified nine independently evolved sex chromosomes in a wider variety of species than had previously been examined and determined that these newly formed X-chromosomes have become dosage compensated, to balance the relative gene expression between

males and females.

Drs. Bachtrog and Vicoso also found evidence of female-biased expression of these chromosomes in the gonads, as expected if sexual antagonism in the form of opposing selective pressures in males versus females played an important role in shaping the expression of this chromosome.

More information: Abstract: "Frequent sex chromosome transitions in Dipterans." Beatriz Vicoso, Doris Bachtrog. UC Berkeley, Berkeley, CA. abstracts.genetics-gsa.org/cgi … il.pl?absno=14531897

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