

PublisherInfo		
PublisherName	:	BioMed Central
PublisherLocation	:	London
PublisherImprintName	:	BioMed Central

## Sex drives evolution

ArticleInfo		
ArticleID	:	4790
ArticleDOI	:	10.1186/gb-spotlight-20030613-01
ArticleCitationID	:	spotlight-20030613-01
ArticleSequenceNumber	:	142
ArticleCategory	:	Research news
ArticleFirstPage	:	1
ArticleLastPage	:	2
ArticleHistory	:	RegistrationDate : 2003-6-13 OnlineDate : 2003-6-13
ArticleCopyright	:	BioMed Central Ltd2003
ArticleGrants	:	
ArticleContext	:	130594411

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Following species divergence, differences arise in the expression levels of various genes, as a result of natural selection. Differences in gene expression levels also occur within a species but [between the sexes](#), with most of these differences being attributable to sexual dimorphism, and sex-specific behavior and reproduction. In the 13 June issue of [Science](#), Jose Ranz and colleagues at [Harvard University](#), USA, report the use of microarray technology coupled with statistical analysis to examine the evolutionary pattern of gene expression differences in *D. melanogaster* and *D. simulans*, which diverged about 2.5 million years ago, across the whole genome.

Ranz and coworkers analyzed both transcription products and genomic DNA in multiple hybridizations against microarrays containing 4,776 *Drosophila* coding sequences. Of these, 2,493 genes had not changed in relative expression levels since species divergence, and 57.5% of these showed sex-biased expression. The remaining half of the sequences on the microarrays, 2283 genes, showed expression levels that had altered between the species. Of these, only 16.6% showed the same alterations in expression levels between the sexes in both species; the remainder showed an evolutionary pattern that was sex-specific. Half of these retained the same gender bias, while the remainder showed gain or loss, and in 20 there was reversal of gender-specific bias. Most of the interspecific differences were found in male-biased genes, in agreement with the observation that male-specific morphological features evolve more rapidly than those of females. The distribution of the sex-biased genes was non-random, in contrast to the situation observed in mammals.

"The observations that 83% of the interspecific changes in gene expression are sex-dependent and that divergence in expression levels is greater in males suggest that sex-dependent selection is a major force driving the recent evolution of the *Drosophila* expression profile," the authors conclude.

## References

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