URLs

GENOME EVOLUTION

Doubling or splicing: the intimate relationship

Alternative splicing and gene duplication are evolutionary forces that drive new biological functions. But how do these two modes of functional diversification relate to each other?

A study from Kopelman and colleagues now reveals an inverse correlation between the size of a gene's family and its propensity to produce alternative splice variants. Through evaluation of human gene families with reference to species with different times of divergence, the authors show that genes of family size 1 (singletons) use alternative splicing more than genes that have undergone duplications. Furthermore, comparisons between human and mouse orthologues under different duplication models show that the rate of alternative splicing is three times higher in conserved singletons than in genes that have been duplicated in both lineages.

So, do duplicates lose splice variants or do singletons acquire them? The authors found a positive correlation between the age of a duplication event and the fraction of alternative splicing — a model that is further supported by the recent observation that alternative splicing frequently evolves through exon duplication.

These results have implications for understanding the molecular evolutionary mechanisms that lead to genetic innovations, indicating that the pressure for new functions precedes duplication events.

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References and links

ORIGINAL RESEARCH PAPER Kopelman, N. M. *et al.* Alternative splicing and gene duplication are inversely correlated evolutionary mechanisms. *Nature Genet.* 15 May 2005 (doi:10.1038/ng1575)

WEB SITE

Itai Yanai's web page: <http://www.yanaiweb.com/itai.html>