Conservation of Gene Orientation in Fungi

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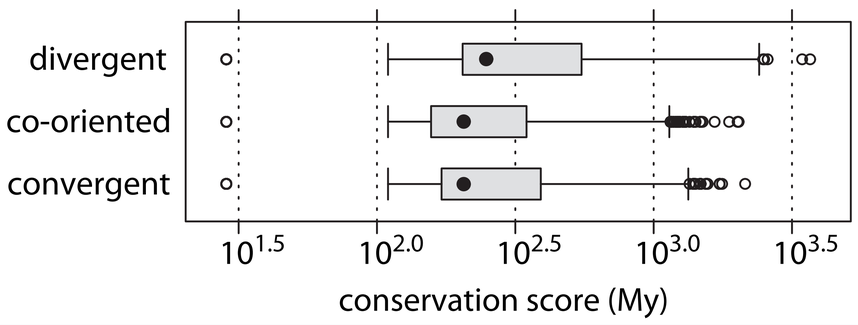
Introduction

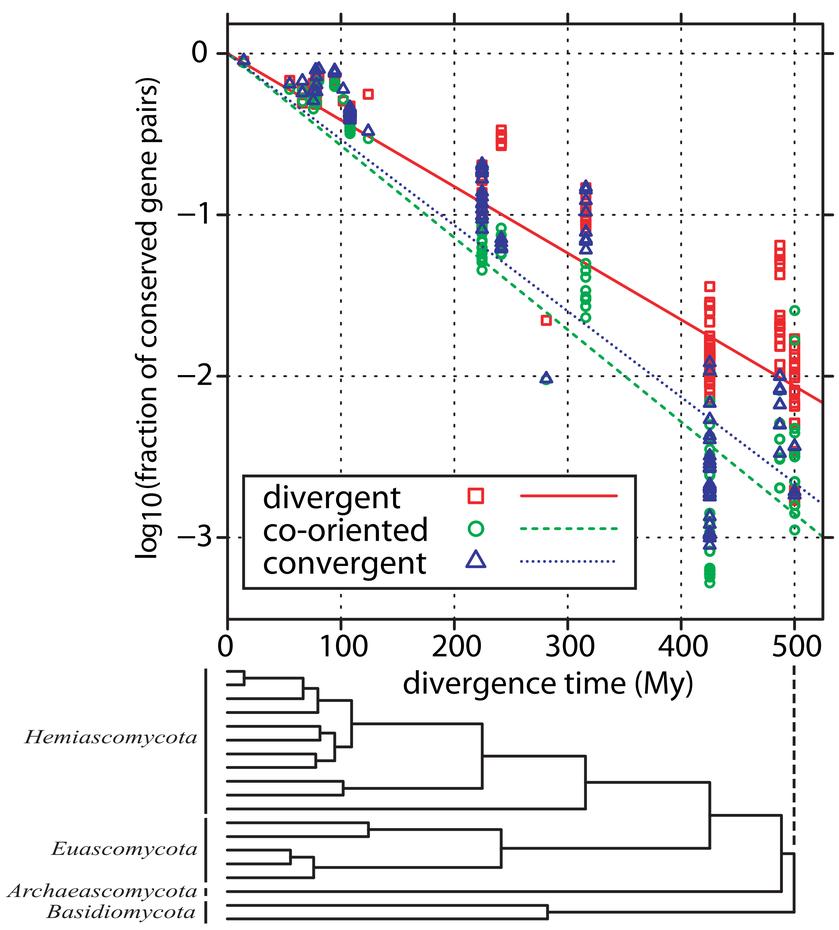
We quantified the conservation of divergent (←→), co-oriented (→→) and convergent (→←) genes in the genomes of 19 asco- and basidiomyceteous fungi.

Conservation based on Dollo parsimony

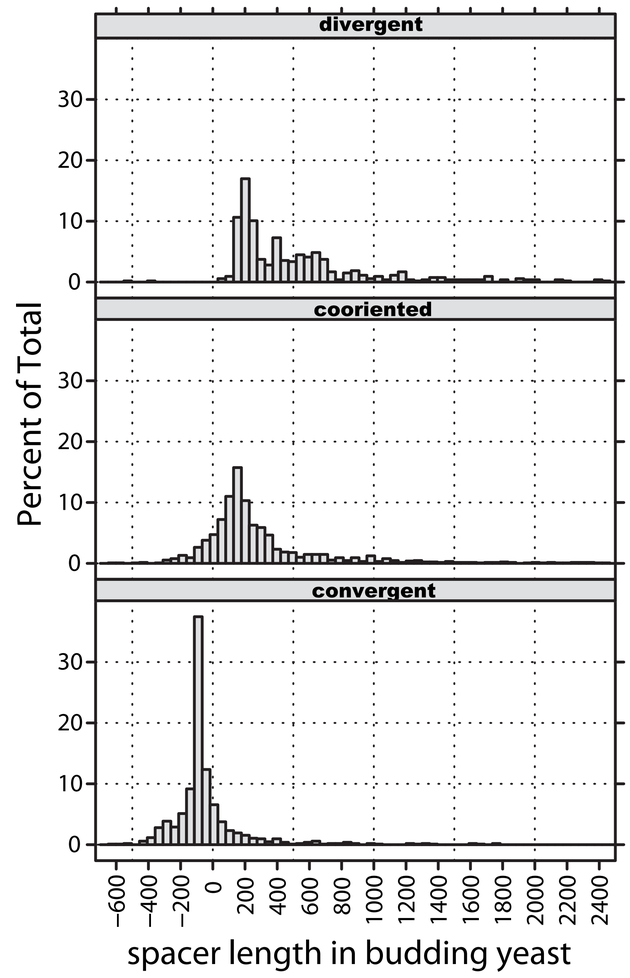
Divergently transcribed gene pairs are on average 61 million years longer conserved than co-oriented gene pairs, leading to a 3-fold higher probability of conservation of divergent gene orientation at a score cutoff of 1000 million years.



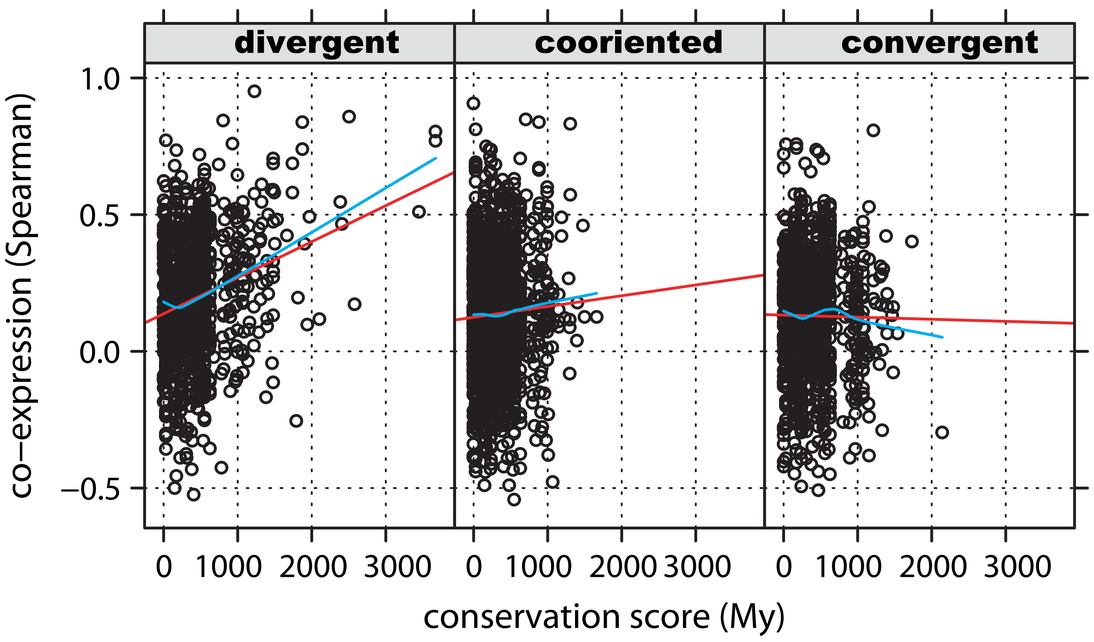
Divergent gene pairs are more conserved ...



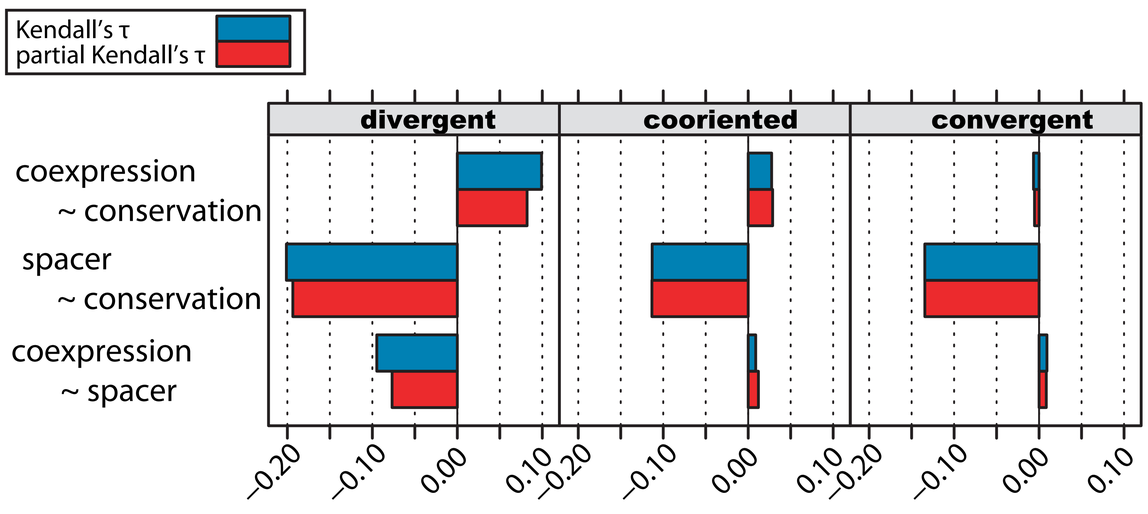
... although they are more distant!



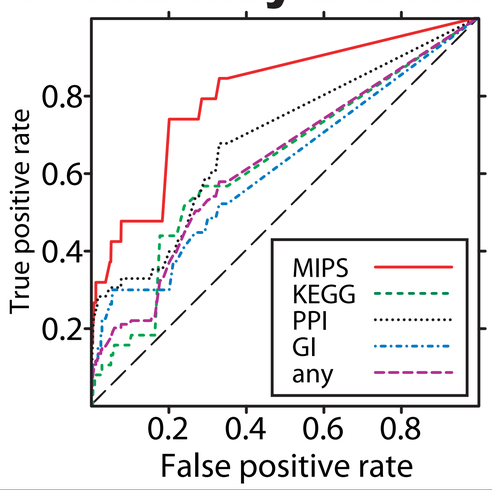
For divergent gene pairs the conservation correlates with co-expression ...

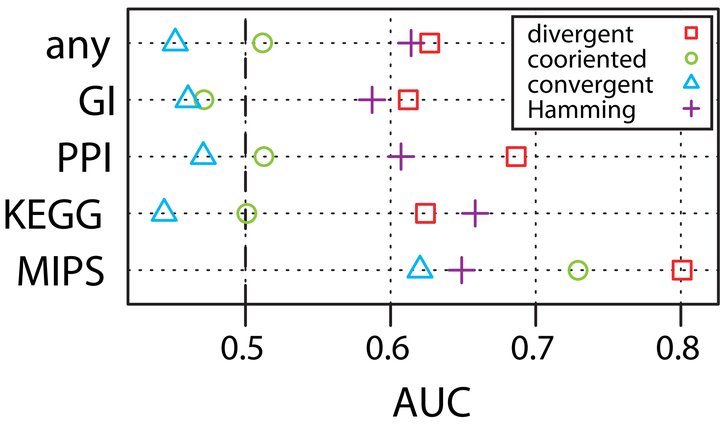


... independent of spacer length ...



... and they are functionally related!

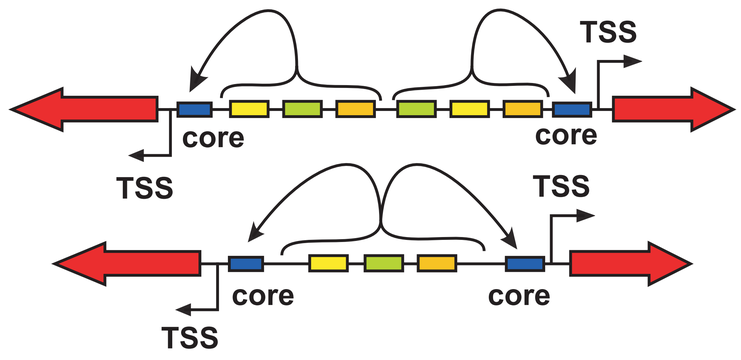




Shared TFs suggest bidirectional promoters between conserved divergent gene pairs

≤ 500 My
#TF(div.) > #TF(coor.)
$p<3.3\times10^{-8}$, Δmeans=0.50

> 500 My
#TF(div.) ~ #TF(coo.)
p=0.19, Δmeans=0.07



... even when controlling for spacer length
(≤ 500 My: $p<2.4\times10^{-4}$; > 500 My: p=0.53; one-sided U tests)

Acknowledgements

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