

# The gain and loss of genes during 600 million years of vertebrate evolution

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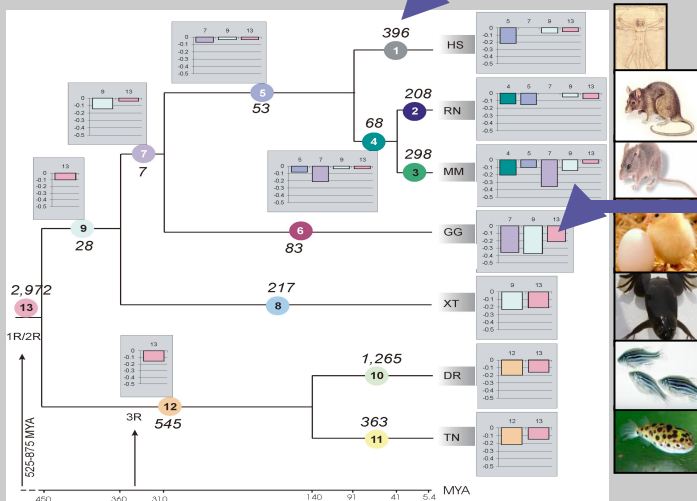
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## Duplications in the evolution of vertebrates:

Continuous mode of small-scale duplications

Large-scale duplication events (whole genome duplications):

- > 1R/2R: common ancestor of land vertebrates and fishes
- > 3R: fish-specific



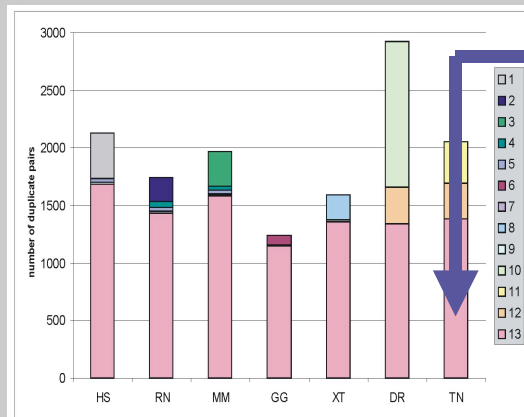
Number of duplication events on branch 1

Fraction of genes, coming from duplication events in branch 13, that are lost on branch 6

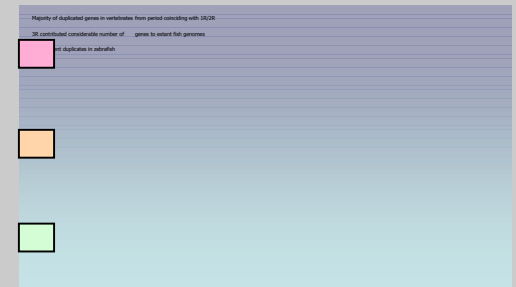
Ancient duplicates that have survived for many years can still be lost

Large differences in the number of species-specific duplication events

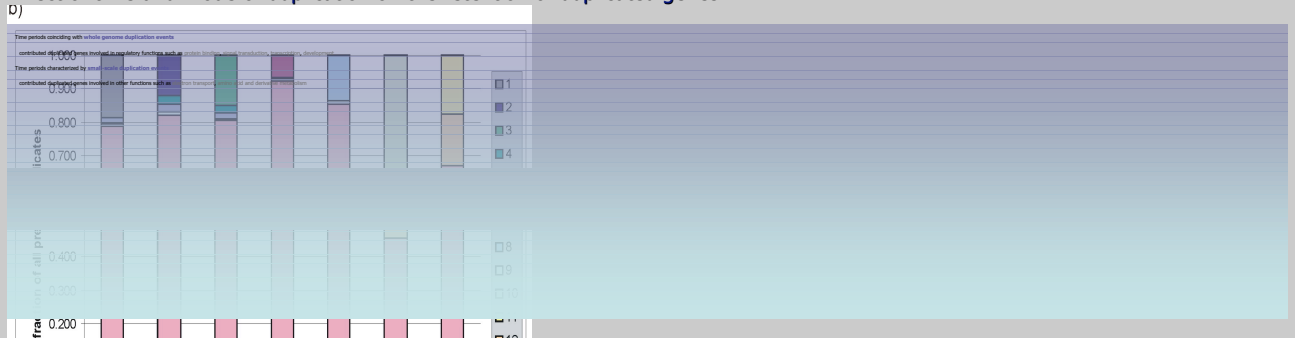
## Origin of duplicated genes in current vertebrate genomes



About 1,400 duplicated gene pairs in the *Tetraodon nigroviridis* genome originated through duplication events at a time coinciding with 1R/2R



## Effect of time and mode of duplication on the retention of duplicated genes



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