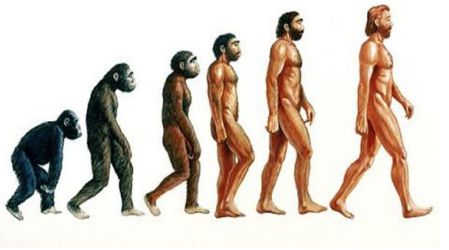
Genomics Shed Light on Mysteries of Evolution
Sequencing our way back to the origin of Vertebrates

The advent of Genomics enabled sequencing of whole genomes, providing insight into the evolutionary relationship of distant species. Scientists have long pondered on the evolution of vertebrates from an invertebrate ancestor and genomics might be the key to this mystery.

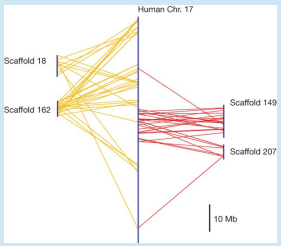
17 groups of linked genes shared between invertebrates and vertebrates and 90% of them conserved in Humans



Vertebrate conserved genes and genome organisation with invertabrate lineage

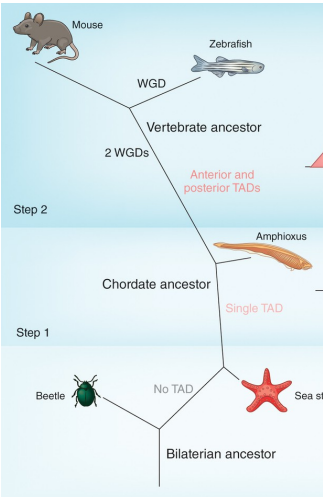
Amphioxous is an invertebrate descendant from the Chordate common ancestor.

Sequencing of its draft genome and matching scaffolds to human chromosomes showed that orthologues on one scaffold matched orthologues at specific human chromosome region, indicating that both ancestral genes and organisation was conserved



Chordate

Comparative Genomic studies established that these linked groups of genes were inherited from a Chordate, a common invertebrate-vertebrate ancestor



Genome-wide duplication caused vetebrate evolution

Once the vetebrate lineage was formed from Chordate, a genome wide duplication event occurred in the vertabrate lineage which caused divergence from their invertebrate ancestor

The genome-wide duplication event was confirmed by comparing paralogues in a sequenced prototype genome of the ancestor Chordate with those in human chromosomes. This showed that the human chromosome had numerous copies of the ancestry paralogues.

Main Reference: Putnam et al 2008