

Appendix: Comparison between genetic evolution and phenogenetic variation

Characteristic	Evolution	Phenogenetics
Overall principle	Descent with modification	Duplication with variation
Explains	Life through the history of organisms	Life through form and function, a somatic history with organisms
Source of variation	Gametic mutation	Differential gene expression
Means of sequestration	Mating barriers and speciation through mechanisms of genomic and ecological isolation	Partial sequestration with information transfer through signaling using arbitrary codes
Means of divergence	Adaptation by competitive response to external conditions	Functional specialization through programmed response to signaling and other internal conditions
Role of chance	Genetic drift	Molecular stochasticity in timing and concentration of components, somatic mutation and epigenetic modification (for example, methylation)