Genetic Variation

- two main sources of genetic variation: mutations & gene shuffling that results from sexual reproduction
- in population -> individuals interbreed -> common group of genes (gene pool)
- gene pool: all different genes & alleles in a population
- relative frequency: number of times the allele occurs in a gene pool compared to number of times other alleles for the same gene occur
- evolution is any change in the relative freequency of a population

Sources of Genetic

- sexual reproduction does not hcange relative frequency

Single-Gene & Polygenic Traits

- numbe of phenotypes produced for a trait depends on how many genes control the trait
- single gene trait: trait conrolled by single gene with two alleles (widow's peak) -> bar graph
- polygenic trait: many traits controlled by two or more genes (height) -> bell-shaped curve

Natural Selection on Single-Gene Traits

- natural selection on single-gene traits -> changes in allele frequencies -> evolution

Natural Selection on Polygenic Traits

- natural selection can affect the distribution of phenotypes in three ways: directional selection, stabilizing selection, or disruptive selection
- directional selection: individuals at one end of curve have a higher fitness than middle or other end
- stabalizing selection: individuals near center of curve have higher fitness than eithe sides of curve
- disruptive selection: individuals at upper & lower ends of curve have higher fitness than individuals near the middle

Genetic Drift

- genetic drift: random change in allele frequency
- genetic drift can occur when a small group of a population colonizes a new habitat
- founder effect: allele frequencies change as a result of the migration of a small subgroup of a population

Hardy-Weinberg & Genetic Equillibrium

- Hardy-Weinberg Principle: allele frequencies in a population will remain constant unless one or more factors cause those freqeuncies to change
- genetic equilibrium: frequencies remain constant
- five conditions to manatin genetic eq. -> random mating, large pop, no movement in/our of pop, no mutations, no natural selection

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Published 27th May, 2023.
Last updated 25th May, 2023.
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