Ch 23.1 Notes

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Vocab

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Microevolution: Evolutionary change in populations, we can define evolution on its smallest scale.

Genetic Variation: Differences among individuals in the composition of their genes or other DNA sequences.

Neutral Variation: Differences in DNA sequence that do not confer a selective advantage or disadvantage.

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Microevolution and allele frequency changes

Microevolution

* Evolutionary changes in a population
* Change in allele frequency of a population over generations

Causes of allele frequency changes

* Natural selection (we talked about this)
* Genetic drift
  + Based on chance events
* Gene flow
  + Transfer of alleles between populations

Genetic variation makes evolution possible

Genetic variation in a population increases the chance that some individuals will survive.

Genetic variation comes from several sources.

Genetic variation and survival

Expression of different phenotypes depends on genetic variation.

* Differences among individuals (genes/DNA)

Lots of variation= wide range of phenotypes

More variation= more likely that some individuals can survive if environment changes

Different combinations of alleles= mating

How frequent an allele appears= allele frequency

* Number of times allele occurs in gene pool/total number of alleles for that gene in the gene pool

Sources of genetic variation

Mutation

* RANDOM change in DNA sequence
* Can form a new allele
* IF mutation is in gamete, can be passed on

Recombination (crossing over)

* New allele combinations
* During meiosis
* Shuffling of alleles, NOT making new ones

Why aren’t mutations in nonreproductive cells sources of genetic variation?

If a certain trait’s allele frequency is 100%, describe the genetic variation for that trait in the population.

How can “heterozygote protection” help maintain a harmful allele?

Altering gene number

* Errors in meiosis
  + Unequal crossing over
  + Slippage during DNA replication
  + Transposable elements
    - “Jumping genes”
    - Genes that can move locations.
  + Rapid reproduction
    - Fast reproduction= more chances for mutations