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evolution is defined as the change in the inherited traits of a population of organisms through successive generations when living organisms reproduce they pass on to their progeny a collection the selection of mates based on heritable traits gene flow the movement of genes into or out of a population study with quizlet and memorize flashcards containing terms like directional selection stabilizing selection disruptive selection and more genetic diversity in a population comes from two main mechanisms mutation and sexual reproduction mutation a change in dna is the ultimate source of new alleles or new genetic variation in any population the genetic changes that mutation causes can have one of three outcomes on the phenotype evolution is a process that results in changes in the genetic material of a population over time evolution reflects the adaptations of organisms to their changing environments and can result natural selection on polygenic traits can affect the distributions of phenotypes in three ways directional selection stabilizing selection or disruptive selection evolutionary fitness is the success in passing genes to the next generation evolutionary genetics examines the genetic relationships among groups of organisms and how changes in their genes shape the patterns of evolution and biodiversity chapter 16 2 evolution as genetic change essential questions how does natural selection affect single gene polygenic traits what is genetic drift what are 5 conditions needed to maintain genetic equilibrium until now we have discussed evolution as a change in the characteristics of a population of organisms but behind that phenotypic change is genetic change in population genetics the term evolution is defined as a change in the frequency of an allele in a population evolution as related to genomics refers to the process by which living organisms change over time through changes in the genome such evolutionary changes result from mutations that produce genomic variation giving rise to individuals whose biological functions or physical traits are altered in lecture two of a four part series evolutionary biologist david kingsley discusses how just a few small genetic changes can have a big effect on morphology using examples from maize dog breeding and stickleback fish a situation in which allele frequencies change as a result of the migration of a small subgroup of a population is known as the founder effect the evolution of fruit flies on different hawaiian islands what is an example of the founder effect the hardy weinberg principle predicts that five conditions can disturb genetic equilibrium and cause evolution to occur 1 nonrandom mating 2 small population size and 3 immigration or emigration 4 mutations or 5 natural selection the fur color is controlled by a single gene there are only two phenotypes for this trait gray or black fur describe how the relative frequency of fur color alleles is changing in this population and propose one explanation for this change essential questions how does natural selection affect single gene polygenic traits what is genetic drift what are 5 conditions needed to maintain genetic equilibrium natural selection on single gene traits can lead to changes in allele frequencies example lizard orange color allele could genetic variations that alter gene activity or protein function can introduce different traits in an organism if a trait is advantageous and helps the individual survive and reproduce the genetic variation is more likely to be passed to the next generation a process known as natural selection five conditions are required to maintain genetic equilibrium from generation to generation 1 there must be random mating 2 the population must be very large and 3 there can be no movement into or out of the population 4 no mutations and 5 no natural selection for at least the past 5 decades population genetics as a field has worked to describe the precise balance of forces that shape patterns of variation in genomes the problem is challenging because modeling the interactions between evolutionary processes is difficult and different processes can impact genetic variation in similar ways in the domain of digital literature burstiness is not just about diversity but also the joy of discovery chapter 16 2 evolution as genetic change excels in this dance of discoveries regular updates ensure that the content landscape is ever changing introducing readers to new authors genres and perspectives 17 2 evolution as genetic change in populations a random change in allele frequency founder effect this occurs when a few individuals colonize a new habitat these founding individuals carry alleles that differ in relative frequencies from the main population 17 2 evolution as genetic change in population we can view as success in passing genes to the next generation and we can view an as any genetically controlled trait that increases an individual s ability to pass along its 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genetic diversity in a population comes from two main mechanisms mutation and sexual reproduction mutation a change in dna is the ultimate source of new alleles or new genetic variation in any population the genetic changes that mutation causes can have one of three outcomes on the phenotype

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evolution is a process that results in changes in the genetic material of a population over time evolution reflects the adaptations of organisms to their changing environments and can result

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natural selection on polygenic traits can affect the distributions of phenotypes in three ways directional selection stabilizing selection or disruptive selection evolutionary fitness is the success in passing genes to the next generation

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until now we have discussed evolution as a change in the characteristics of a population of organisms but behind that phenotypic change is genetic change in population genetics the term evolution is defined as a change in the frequency of an allele in a population

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evolution as related to genomics refers to the process by which living organisms change over time through changes in the genome such evolutionary changes result from mutations that produce genomic variation giving rise to individuals whose biological functions or physical traits are altered

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a situation in which allele frequencies change as a result of the migration of a small subgroup of a population is known as the founder effect an example is the evolution of fruit flies on different hawaiian islands what is an example of the founder effect

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the hardy weinberg principle predicts that five conditions can disturb genetic equilibrium and cause evolution to occur 1 nonrandom mating 2 small population size and 3 immigration or emigration 4 mutations or 5 natural selection

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the fur color is controlled by a single gene there are only two phenotypes for this trait gray or black fur describe how the relative frequency of fur color alleles is changing in this population and propose one explanation for this change

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essential questions how does natural selection affect single gene polygenic traits what is genetic drift what are 5 conditions needed to maintain genetic equilibrium natural selection on single gene traits can lead to changes in allele frequencies example lizard orange color allele could

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genetic variations that alter gene activity or protein function can introduce different traits in an organism if a trait is advantageous and helps the individual survive and reproduce the genetic variation is more likely to be passed to the next generation a process known as natural selection

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five conditions are required to maintain genetic equilibrium from generation to generation 1 there must be random mating 2 the population must be very large and 3 there can be no movement into or out of the population 4 no mutations and 5 no natural selection

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for at least the past 5 decades population genetics as a field has worked to describe the precise balance of forces that shape patterns of variation in genomes the problem is challenging because modeling the interactions between evolutionary processes is difficult and different processes can impact genetic variation in similar ways

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