Lect 5: Mutation Lecture

Which Alleles are from homozygous recessive parents: **TT x TT or tt x tt or TT x tt or Tt x Tt**	**Which Alleles are from homozygous dominant & recessive parents:** **TT x TT or tt x tt or TT x tt or Tt x Tt**
Which Alleles are from heterozygous parents : **TT x TT or tt x tt or TT x tt or Tt x Tt**	**Which Alleles are from homozygous dominant parents** **TT x TT or tt x tt or TT x tt or Tt x Tt**

show genotype of children of homozygous recessive& dominant parents. PLUS phenotype. Use letter T or t	**show genotype of children of homozygous recessive & Heterozygous parents. PLUS phenotype .Use letter T or t**

Define: Mutation:_____ resulting from an error in mitosis or meiosis or an environmental factor. Adds variation to genes and can be harmful, beneficial or neutral

Part 2 Mutations: Types of Mutations:

Inversion: a mutation in which a section of the chromosome is _____
Normal: 1 2 3 4 5 6 Inversion

Duplication: a mutation in which a section of the chromosome is_____
Normal: 1 2 3 4 5 6 Duplication:

Translocation: a chromosome mutation in which a section of chromosome is _____ to another chromosome
Normal: 1 2 3 4 5 6 Translocation:

Deletion: a chromosome mutation in which a portion of the chromosome is _____
Normal: 1 2 3 4 5 6 Deletion:

Write/Illustrate by example the following mutations: Normal: A B C D E F

INVERSION: _____

DUPLICATION: _____

TRANSLOCATION: _____

DELETION: _____

The Genetics of Parenthood Guide

Why do people, even closely related people, look slightly different from each other? The reason for these differences in physical characteristics (called phenotype) is the different combinations of genes possessed by each individual.

To illustrate the tremendous variety possible when you begin to combine genes, you and a classmate will establish the genotypes for a potential offspring. Your baby will receive a random combination of genes that each of you, as genetic parents, will contribute. Each normal human being has 46 chromosomes (23 pairs which are diploid -2 in a pair) in each cell. In forming the gametes (egg or sperm) one of each chromosome pair will be given, so these cells have only 23 single chromosomes (haploid- through meiosis). In this way, you contribute half of the genetic information (genotype) for the child; your partner will contribute the other half.

Because we don't know your REAL genotype, we'll assume that you and your partner are heterozygous (different genotype letters) for every facial trait. Which one of the two available alleles you contribute to your baby is random, like flipping a coin. In this lab, there are 36 gene pairs and 30 traits, but in reality there are thousands of different gene pairs, and so there are millions of possible gene combinations.

Several inheritance patterns are represented in this simulation, and it is important to review these. Inheritance of the traits in this simulation, have been simplified to serve as a model; actual inheritance of the traits are far more complex.

terms to know:

Allele: form of a gene. For every gene there can be 2 alleles

Phenotype: What the organism looks like (brown eyes, blue eyes)

Genotype: What the alleles are for a trait (BB, Bb, bb)

Dominant: allele which masks the expression of another because it's DOMINANT, represented by capital letters (B,R,V)

Recessive: allele which is expressed only if both parents contribute it, represented by small letters (b,r,v)

Incomplete Dominance: phenotype of the heterozygote is an intermediate form; represented by capital letters and subscripts (C_1, C_2) ; an example is red color tints in the hair

Polygenic: several genes contribute to the overall phenotype; an example is skin color

Sex-linked: commonly applied to genes on the X chromosome, the more current term is X-linked; genes on the y chromosome are "holandric". This activity will NOT have these examples

dihybrid: A hybrid for two different genes. Heterozygous for two pairs of alleles. AABb (etc)

mutation: a change in a gene or chromosome resulting from an error in mitosis or meiosis or an environmental factor. Adds variation to genes and can be harmful, beneficial or neutral.

Inversion: a mutation in which a section of the chromosome is inverted
Normal: 1 2 3 4 5 6 Inversion 1 5 4 3 2 6

Duplication: a mutation in which a section of the chromosome is duplicated
Normal: 1 2 3 4 5 6 Duplication: 1 2 **3 3** 4 5 6

Insertion or Translocation:a chromosome mutation in which a section of chromosome is **transferred to another chromosome**
Normal: 1 2 3 4 5 6 Translocation: 9 10 11 12 13 1 2 3

Deletion: a chromosome mutation in which a portion of the chromosome is left out or deleted
Normal: 1 2 3 4 5 6 Deletion: 1 2 3 5 6

Lect 6: Sandwich Mutation Lab

Normal:

1. Open bread
2. Take out 1 slice. This is bread slice 1
3. Take out 1 slice. This is bread slice 2.
4. Close bread.
5.Open jelly.
6. Place jelly on one bread slice
7. close jelly
8. Open P-nut butter
9. Place P-nut butter one bread slice
10. Close P-nut butter
11. Place the bread slices together so that the PB & J are inside
12. Eat the sandwich

Duplication

1. Open bread
2. Take out 1 slice. This is bread slice 1
3. Take out 1 slice. This is bread slice 2.
4. Close bread.
5.Open jelly.
6. Place jelly on one bread slice
6. Place jelly on one bread slice
7. close jelly
8. Open P-nut butter
9. Place P-nut butter one bread slice
10. Close P-nut butter
11. Place the bread slices together so that the PB & J are inside
12. Eat the sandwich

Inversion

1. Open bread
2. Take out 1 slice. This is bread slice 1
3. Take out 1 slice. This is bread slice 2.
4. Close bread.
5.Open jelly.
6. Place jelly on one bread slice
7. close jelly
12. Eat the sandwich
8. Open P-nut butter
9. Place P-nut butter one bread slice
10. Close P-nut butter
11. Place the bread slices together so that the PB & J are inside

Translocation

1. Open bread
2. Take out 1 slice. This is bread slice 1
3. Take out 1 slice. This is bread slice 2.
4. Close bread.
5.Open jelly.
6. Place jelly on one bread slice
7. close jelly
new 13. open cream cheese
new 14. place cream cheese on one slice
new 15. close cream cheese
11. Place the bread slices together so
12. Eat the sandwich

off to another sandwich...
8. Open P-nut butter
9. Place P-nut butter one bread slice
10. Close P-nut butter

Deletion

1. Open bread
2. Take out 1 slice. This is bread slice 1
3.
4. Close bread.
5.Open jelly.
6. Place jelly on one bread slice
7. close jelly
8. Open P-nut butter
9. Place P-nut butter one bread slice
10. Close P-nut butter
11. Place the bread slices together so that the PB & J are inside
12. Eat the sandwich

Conclusion: 5 sentences

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