

Twins & Mutations

Identical Twins vs. Fraternal Twins

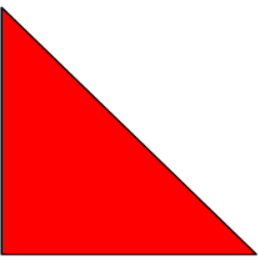
All offspring begin as one cell with a “male” and “female” gamete that have combined their DNA.

The offspring are unique for each individual fertilized gametes...but there is an exception.

Identical Twins vs. Fraternal Twins

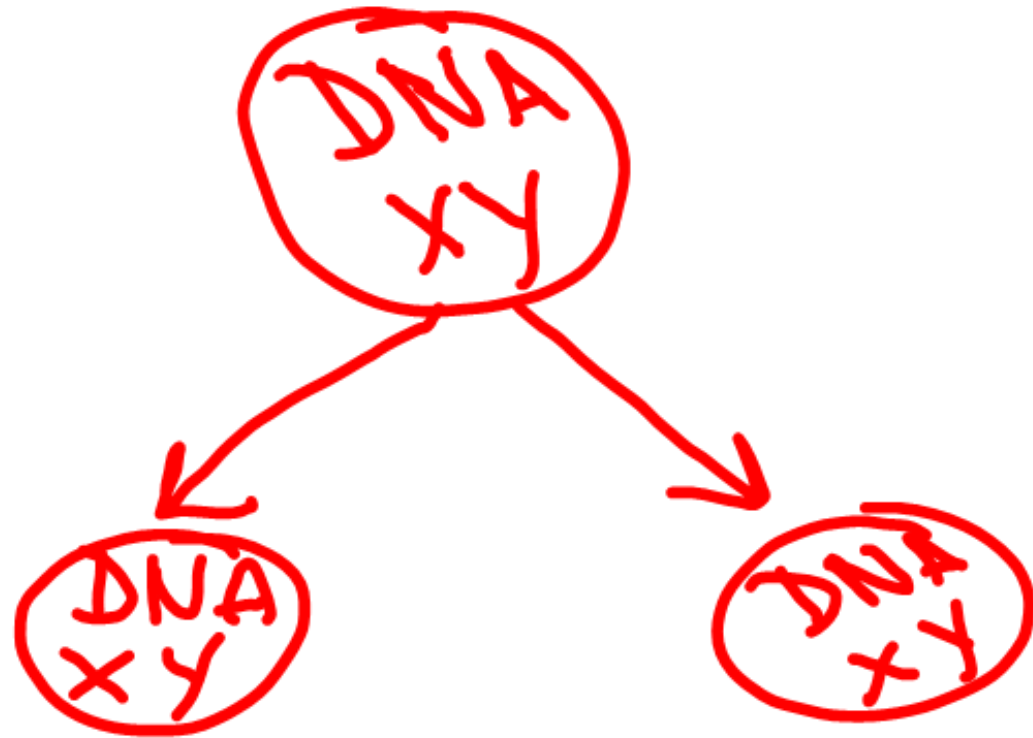
Identical

In the case of identical twins one “egg” is fertilized and then splits into two separate individuals. Since the two individuals came from the same fertilized gametes they have the same genotype...so they also have the same phenotype

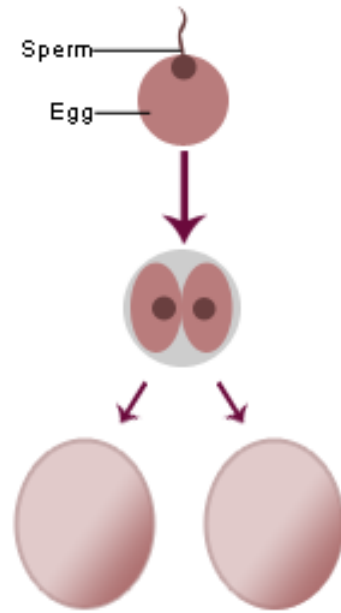


Identical Twins vs. Fraternal Twins

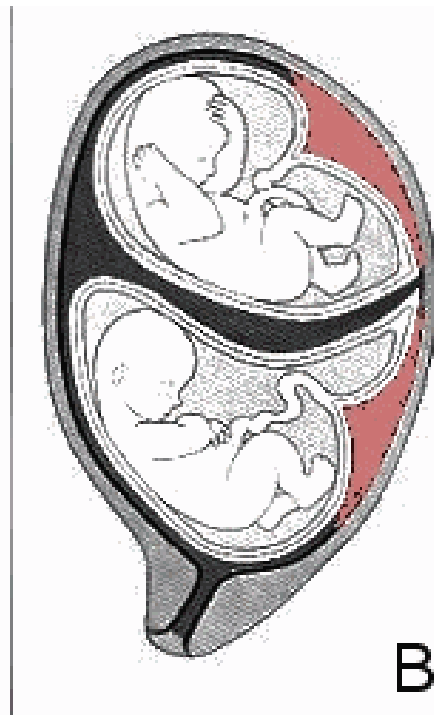
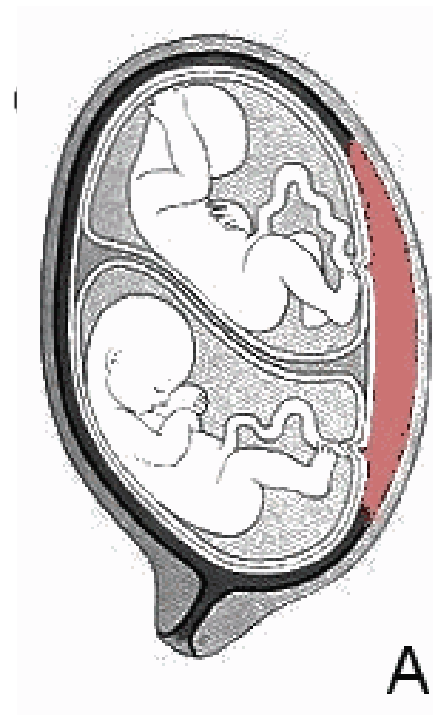
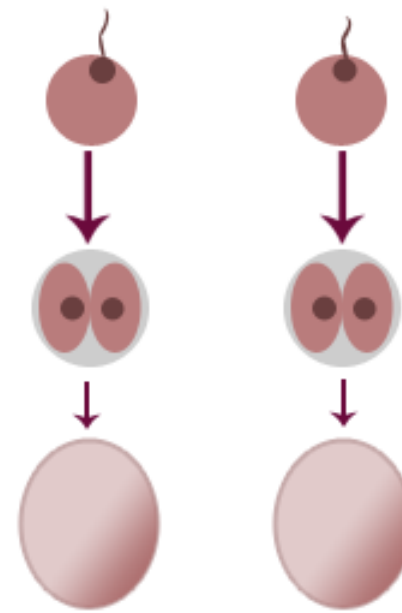
Diagram of Identical twin



a) Identical (Monozygotic) Twins



b) Fraternal (Dizygotic) Twins



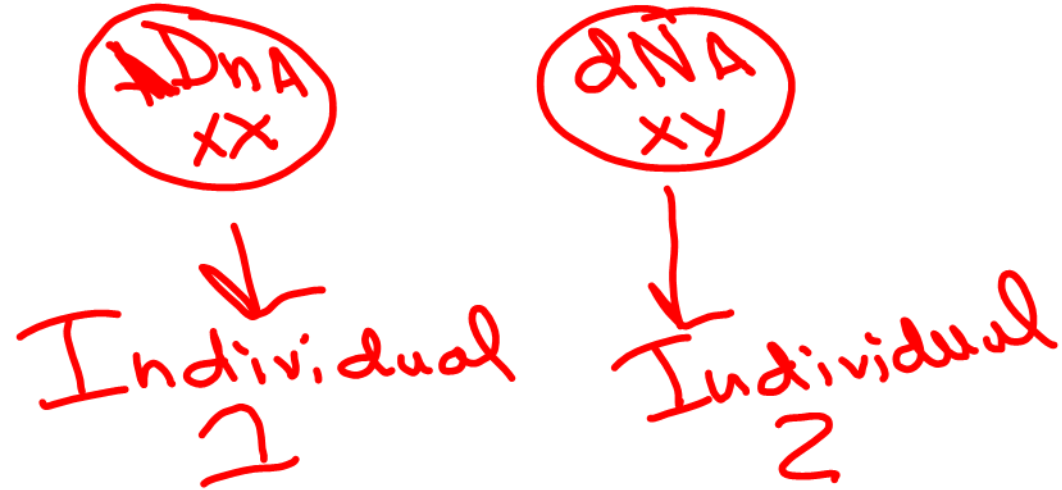
Identical Twins vs. Fraternal Twins

Fraternal (means “brotherly”)

In the case of fraternal twins two totally different eggs are fertilized. Since the two individuals came from different fertilized gametes they have different genotypes...so they also have the different phenotype

Identical Twins vs. Fraternal Twins

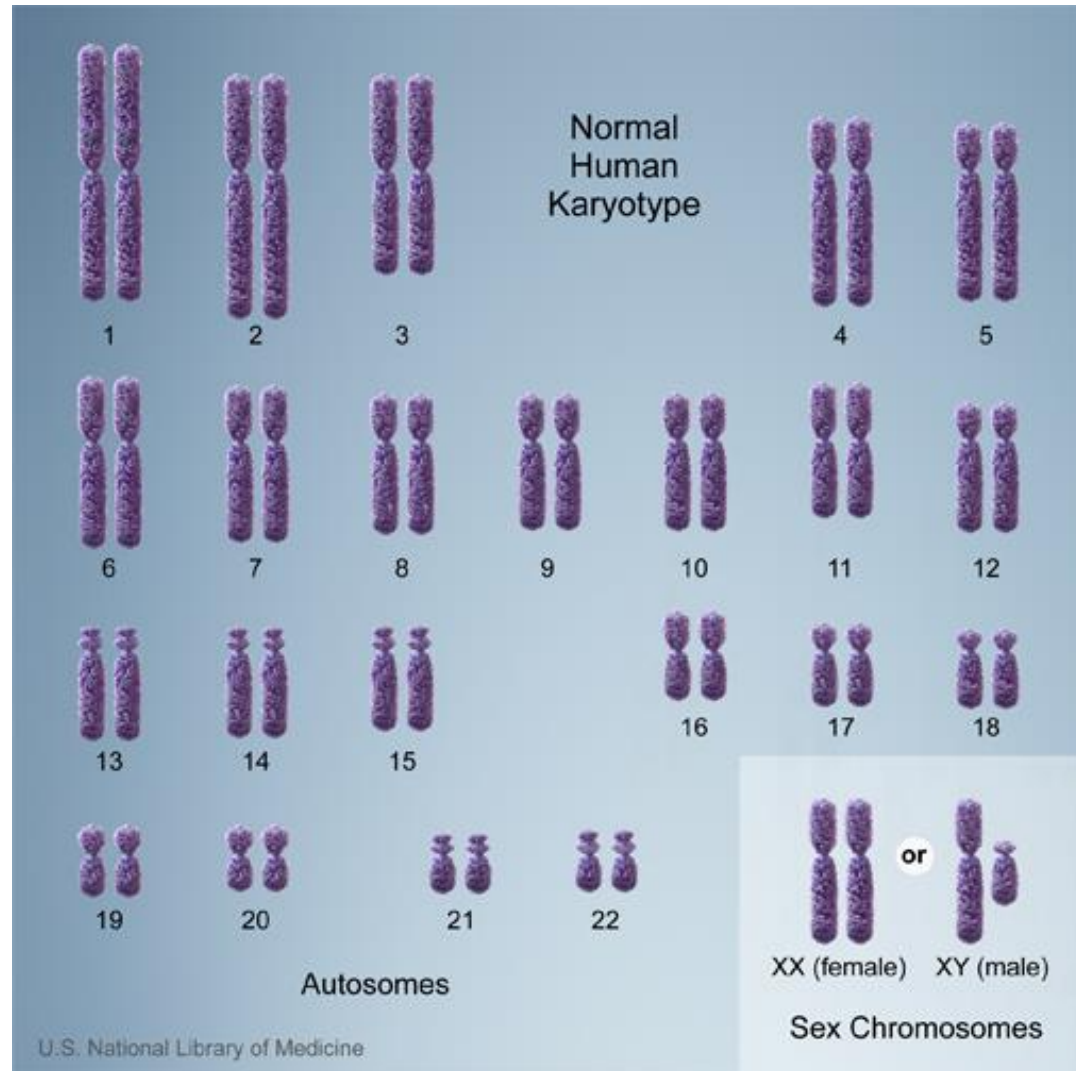
Diagram of Fraternal twins



Triplets



What is a mutation?



What is a mutation?

The DNA contains the instructions to make different proteins that make body parts

When a cell is dividing it copies the DNA in the nucleus

Sometimes the DNA is not copied exactly...that makes for instructions that are not the same as what you started with.

This change in the DNA's original instructions are called **MUTATIONS**.

What is a mutation?

Causes:

- a) Random mistakes in copying
- b) Changes caused by radiation (example: UV rays)
- c) Changes caused by chemicals (cigarette smoke & lung cancer)

What is a mutation?

The mutations can produce:

- 1- No effect at all, does NOT affect how the organism survives (i.e. hair color)
- 2- Beneficial (GOOD)- a mutation that allows the organism to better survive (i.e. resistance to diseases)
- 3- Harmful- a mutation that affects the survival of the organism (i.e. production of cancer cells)