

Genetic Mutations

How Mutations Occur

- DNA in any cell can be altered by way of a number of factors:
 - environmental influences
 - certain chemicals
 - spontaneous mutations
 - errors that occur during the process of replication

Modern Genetic Research

- Human Genome Project
 - An international scientific research project
 - Determining the sequence of chemical base pairs which make up DNA
 - Identifying and mapping the approximately 20,000–25,000 genes of the human genome from both a physical and functional standpoint

- Genetic Engineering/Genetic Modification
 - The direct human manipulation of an organism's genome
 - Involves the introduction of foreign DNA or synthetic genes into the organism of interest
 - Vaccinations
 - Protect crops from insects and/or resistant to herbicides
 - Improve growth rate of food plants
 - Improve longevity of food (doesn't spoil as fast)

- Cloning (using biotechnology)
 - Reproductive cloning generally uses "somatic cell nuclear transfer" (SCNT) to create animals that are genetically identical
 - Scientists have made some major achievements with cloning, including the asexual reproduction of sheep and cows
 - Common practice in the horticultural world for hundreds of years

Ethics

- Just because we can doesn't necessarily mean we should
 - Genetically modified food
 - Stem cell research
 - Cloning animals
 - Cloning humans