

# Genetics & The Human Journey

Chances are you know some families whose members all seem to share one or more common physical characteristics and you have often heard phrases such as “He looks just like his dad.” or “The Johnson brothers all look alike.” The opposite might also be true and you might hear something like “She doesn’t look like either her mother or her father, her hair is very blond and both her parents have dark hair.”

Although most of us have never studied the science of **Genetics** (our genes), we know it is used to explain how traits as basic as skin, eye, and hair colors are inherited from our biological parents. The science is also critical to understanding how susceptible we are to diseases which run in families because they are tied to our heredity. Sickle-cell anemia, coronary heart diseases, cystic fibrosis, asthma, high blood pressure, and diabetes are just a few examples of diseases that often have a genetic cause. Genetic makeup varies substantially from one person to the next and our genes also influence our personality, intelligence, physical appearance and other traits. Learning and environment also play very important roles.

The word **Genetics** comes from the root word gene. It is estimated that every human cell contains approximately 30,000 genes and these genes are the units of heredity that are passed from our parents to our self and our siblings. It is also estimated that the human body is made up of 50 to 100 trillion cells which when combined form our more complex tissues and organs. Essentially genes are the “blueprint” that determines how your cells will function, but an amazing thing is that our body cells are not all alike. There are major differences between brain cells, red blood cells (the only ones not to have a nucleus), muscle cells, fat cells, etc.

To have a very basic understanding of **Genetics** we also need to understand some of the basic genetic terms. The following are from the November 14, 2001 issue of the Journal of the American Medical Association:

**Heritability:** the degree to which a characteristic is determined by a person’s genes.

**Genetic Disorders:** diseases or disorders caused by gene mutations or chromosomal defects (most often when a child is born with an abnormal number of chromosomes or extra or missing pieces of chromosomes)

**Chromosomes:** packets of genes in a cell. Humans have 23 pairs (46 total) of chromosomes. One member of each pair is inherited from your mother and the other from your father. Two of the 46 chromosomes (X,Y) are sex chromosomes that determine whether you are male or female.

**Genome:** an entire system of genes. Genomics is the study of how genes interact and influence the biology and physical characteristics of living things.

**DNA:** abbreviation for deoxyribonucleic acid. This is the chemical inside a gene that carries genetic instructions for making living things. DNA is made up of two long twisting molecules called “the double helix” (looks like a twisted ladder), although it can adopt many different shapes and conformations.

**Mutations:** changes to DNA. Sometimes these changes will be passed on to your children.

We are all interested in our personal family genetics but have you wondered about the history of mankind? Not evolution or how “life” first came into being, not the “big bang” theory or one of several religious theories....but, how the human being has biologically changed over the past 60,000 or so years and how the human race migrated on planet Earth. National Geographic and the IBM Corporation are now into the fifth year of a research effort to collect and genotype at least 100,000 DNA samples from people around the world in order to probe questions about our ancestry and the migrations patterns of humans. The Genography Project combines the latest technology in molecular genetics with computational computer science to trace our genetic heritage back to our ancestors. The general public has been invited to participate by purchasing a kit in order to provide a painless cheek swab to acquire DNA samples. In return participants receive a personalized genetic analysis of their deep ancestral history which traces your relatives’ journeys around our planet.

Would you like to learn more about human genetics, where our ancestors lived and moved as populations and why today we look different from one another? Would you like to know the country where we likely first lived? Would you like to know the mysteries this project is trying to solve? Once a month (usually every third Tuesday) the Delta College *50+...Just Like Gold Program* has a “Bits and Bites” program (a bite to eat first then a bit of information about a subject that is of particular interest to those of us 50+ in age). The Tuesday, February 16, 2010 meeting will be about this topic. You are invited to join us but please call in advance as reservations are necessary and there is a small charge for lunch. If you become a member of the Delta College *50+...Just Like Gold Program* you will pay reduced fees for the monthly meetings as well as all other programs.

Edward Abby said in 1991: “Longevity, like intelligence and good looks and health and strength of character is largely a matter of genetic heritage. Therefore, choose your parents with care.” I encourage you to choose to continue your learning!

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