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to You



NATIONAL HUMAN
GENOME RESEARCH INSTITUTE

www.genome.gov

NIH Publication No: 03-5377
April 2003

A Brief Guide to Genetics.

What makes you different from everyone else?

All humans are basically the same; that is, we are all members of the same species. Yet we are each also unique, with different traits that allow us to stand out as individuals. Some people are short, others tall. There are a variety of eye, skin and hair colors. These physical similarities and differences are due to similarities and differences in our genetic instructions. Our own set of genetic instructions, our "genes," determines our particular traits, inherited from our parents.



Genes come in the form of DNA (deoxyribonucleic acid), a long, thread-like molecule that carries within its coil all of our genetic information. A genome is all of a living organism's DNA. It is the complete set of genetic instructions for building, running and maintaining that organism. Virtually every single cell in the body carries a complete copy of all of the DNA that makes up the genome. All living things, from bacteria to plants to animals, have genomes. Every species has its own genome. Simple organisms, such as bacteria, have small genomes with several hundred to several thousand genes in them. By contrast, humans have a relatively large genome with about 30,000 genes. In any two humans, 99.9% of their DNA is identical. However, the entire set of genetic instructions is so large that the 0.1% variation allows for millions of possible differences. This tiny fraction of DNA where variations occur leads to the enormous diversity that makes each of us unique. Yet, the same variation that causes the differences in our appearance also leads to differences in our likelihood of getting any particular disease.

Knowledge about the effects of DNA variation between individuals can lead to better understanding of diseases and to advances in medicine.

