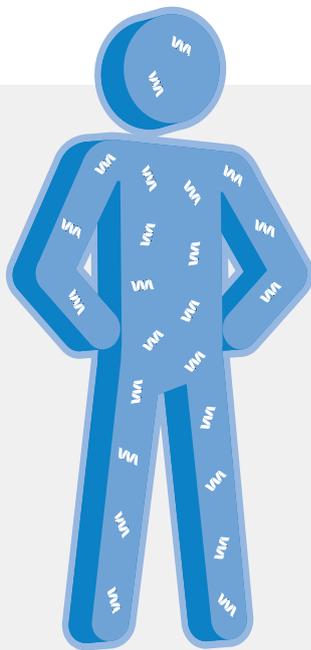


# WHAT IS A GENE?

VOLUME 1.0

You've probably heard about **genes** and how you got your hair colour from one biological parent and your eye colour from the other. But there is so much more to **genetics** and how genes work in the body.



## MAKING PROTEINS

The key role of genes is to provide the instructions for making **proteins**. Proteins are the building blocks of the body and serve important functions like repairing tissue and helping blood to clot.

 = Protein

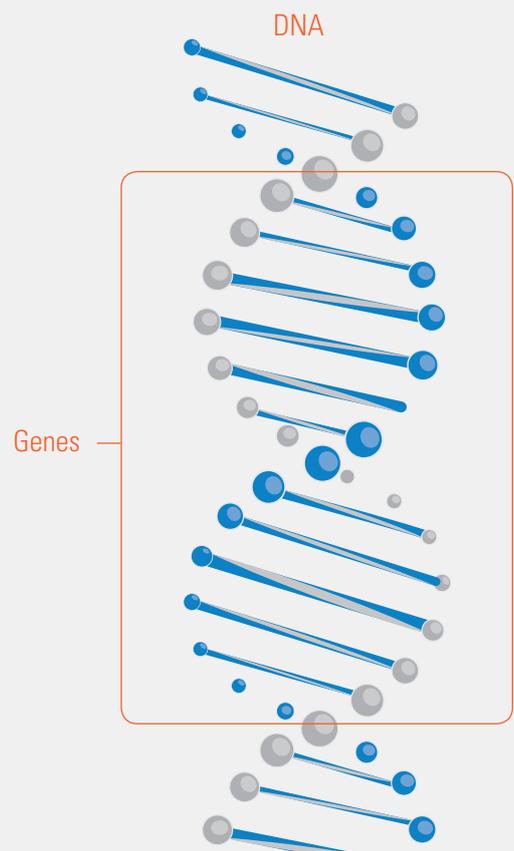


## GENES ARE SEGMENTS OF DNA

Think of **DNA** as the language used in your genetic instructions. DNA is made up of components called **nucleotide bases** that are like the letters of a word. You must have the correct nucleotide bases in the correct order for the gene to fulfill its intended purpose—producing proteins with normal function.

DNA stands for deoxyribonucleic acid. The 4 nucleotide bases responsible for gene construction are adenine (A), guanine (G), cytosine (C), and thymine (T). These nucleotides pair up with each other, A with T and C with G.

*continued on back*

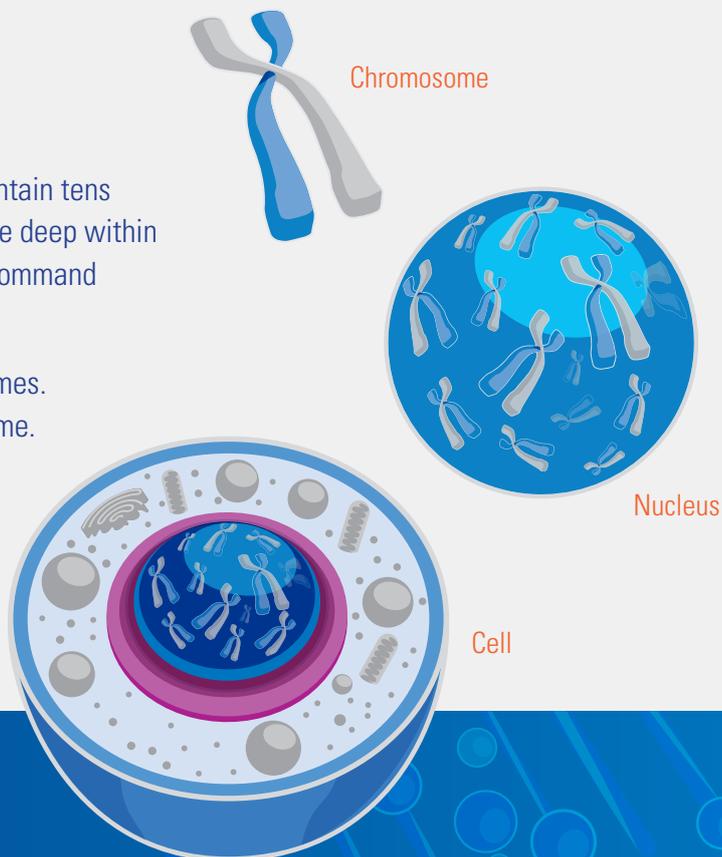


continued from front

## GENES ARE SEGMENTS OF DNA

They can be found in our **chromosomes**, which contain tens of thousands of known genes. Your chromosomes lie deep within a structure called the **nucleus**, which acts as the command center of the **cells** that make up your body.

Human cells typically contain 23 pairs of chromosomes. In males and females, 22 of those pairs look the same. The 23rd pair, also called the sex chromosomes, differs between males and females. Females have two copies of the X chromosome while males have a single pair of X and Y chromosomes.



A gene is a unit of DNA, usually located on a chromosome, that controls the development of one or more traits and is the basic unit by which genetic information is passed from parent to offspring.

## GLOSSARY

**Cell**—The fundamental, structural, and functional unit of living organisms. In biology, a cell is the smallest unit that can live on its own. All living organisms and the tissues of the body are made of cells. A cell has 3 main parts: the cell membrane, the nucleus, and the cytoplasm.

**Chromosome**—A structure found in animal cells containing a linear thread of DNA, which transmits genetic information. Humans normally have 46 chromosomes (23 pairs) in each cell.

**DNA (deoxyribonucleic acid)**—The molecular basis of heredity present in humans and almost all other organisms. Nearly every cell in a person's body contains some DNA.

**Gene**—A part of a DNA molecule, usually located on a chromosome, that is the functional unit of inheritance controlling the transmission and expression of one or more traits from parent to child.

**Genetics**—The study of genes and their heredity. Also, a branch of biology that deals with the heredity and variation of organisms.

**Nucleotide bases**—An organic molecule that is the building block of DNA and ribonucleic acid (RNA).

**Nucleus**—The part of a cell that contains the chromosomes. The nucleus has a membrane around it and is where RNA is made from the DNA in the chromosomes.

**Protein**—A group of amino acids joined together that perform various biological functions. Examples include enzymes, hormones, and antibodies.

brought to you by:

**B:OMARIN**

© 2020 BioMarin Pharmaceutical Inc. All Rights Reserved. MMRC/GTH/0213 01/20

This brochure and the contents within were created for educational purposes only. The content is not prescriptive and should not replace consultation with a trained healthcare provider. Information regarding gene therapy is provided as a general overview and is not comprehensive.