

Mitosis and Meiosis Reading

What is the difference between a non-dividing cell and a dividing cell? The chromatin inside the nucleus of a non-dividing cell is being used by the cell for the manufacture of proteins. We will go into this aspect of cells in the next unit, but let's learn a few things about the normal cell function before we go into cell division.

A Non-dividing Cell Makes Proteins

Proteins are so important to organisms that genes literally control all the phases of life from metabolism, size, color, physiology, development, reproduction etc. In genetics the site where a gene resides is called a **locus (loci is plural)**. The heredity material **DNA** found in the chromatin of a non-dividing cell is organized into units called genes. Each **gene** is literally a code in the form of **codons** that tells the cell how to make a protein. Each codon will tell the cell which amino acid to place next in the protein. Go to the web site below to see the relationship between DNA, genes, Messenger RNA and the making of proteins. The web site actually shows a gene being read and a Messenger RNA forming. The messenger RNA will go out into the cell to the site of a ribosome and begin protein production.

Go to How Life Works and click play.

(http://www.cowilson.org/index.php?option=com_content&task=view&id=28&Itemid=46)

See the reading on protein synthesis on the homepage for more information. We will cover this topic in the next unit.

A dividing cell is not making proteins

When a cell is going to go through mitosis or meiosis the chromosomes appear on the scene. Each **chromosome** is a condensed form of DNA that forms whenever a cell is going to replicate itself or make a sex cell. The DNA is not in the form of chromosomes when the cell is just doing its normal function as you saw in the film. The chromosomes appear when a cell is getting ready to divide. The chromosomes keep the DNA material intact while the cell is dividing or making sex cells. When a cell forms chromosomes the nucleus of the cell breaks down and the chromosomes become visible with a simple light microscope. You can see that the chromosomes pairs look alike in the cell. They not only look alike, they carry the same gene for the same trait at the same locus. These pairs of chromosomes are called the **homologous chromosomes**. You inherited one half of the pair from your mother and one-half from your father. For humans we have 46 chromosomes so we have 23 pairs of homologous chromosomes that carry the same genes. Organisms whose chromosomes come in pairs are called **diploid**. The diploid condition is represented by **2n**. So 2n means they come in pairs.

Winding up the DNA into chromosomes also serves another function – it allows the genes to interact with its partner, **but only during meiosis**. When the sex cells are made cells start out diploid and become haploid, containing one half of their chromosome complement.