Biologie Zusammenfassung 31. 10. 2020

# Nucleus

The Nucleus contains most of the genes in eucaryotic cells. The nuclear envelope separates the nucleus form the cytoplasm. It consists of two lipid bilayers. The envelope has pores that control entry and exit of big molecules.

In the nucleus DNA is organized into chromosomes. Each chromosome contains one long DNA molecule. The complex making up the DNA is called chromatin. If the cell isn’t dividing chromatin appears as diffuse mass. A prominent structure in the nucleus is the nucleolus.

# Chromosomes

A set of chromosomes are chromosomes in a cell. If they are in an organized diagram, you call that a **karyotype**.

A Human has 2\*23 Chromosomes. That’s, because we have two chromosomes of each type, one from father one from mother. That’s called diploid. Females have two X chromosomes, Males one X and one Y.

Each species has a defined number of Chromosomes, closely related species have a similar amount of chromosomes.

More chromosomes doesn’t mean more complex.

Most organisms have a double set of chromosomes. (Diploid)

Two chromosomes are in the same pair if they are homologous. They look similar and contain information about the same topic. The information doesn’t have to be same.

Normally, each chromosome consists of one chromatid. (single chromatid chromosome)

Shortly before cell division this chromatid is duplicated. There are now 2 chromatids held together by the centromere. Then each homologous pair consists of 2 chromatids. (2 double chromatid chromosomes) the two identical chromatids are sister chromatids.

Normally the condensation is loose, the cell only condenses the genetic material to duplicate.

# Mitosis

**Mitosis** is the nuclear division, which produces two identical daughter nuclei. Together with **cytokinesis** it produces two identical cells.

It is used for growth, repair, asexual reproduction

## Interphase

Interphase is the normal working phase. It grows. If the cell plans on dividing, the DNA duplicates. (consists of g1, s, g2)

## Mitosis

### Prophase

Chromosomes condense. (get shorter and thicker)

Nuclear envelopes break down.

Spindles grow out of things which are located on opposite poles.

### Metaphase

Chromosomes align at equator.  
Spindles are fully grown and attach to each sister chromatid.

### Anaphase

The centromere (which holds sister chromatids together) divides. And the spindles pull the sister chromatids apart.

### Telophase

The chromatids reach opposite ends of cell. 2 new nuclear envelopes form and chromosomes decondense. Spindles disappear.

## Cytokinesis

The cell divides, resulting in 2 identical daughter cells.