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Lecture title: **Meiosis:**

Lecturer Affiliation: ***Rasha Jamal Al Dein,*** *BSc, MSc, PhD*
Lecturer, Department of Public Health
College of Veterinary Medicine, University of Mosul, Mosul, Iraq
https://orcid.org/0009-0008-6739-5461

Summary:

Meiosis

Meiosis is a process where a single cell divides twice to produce four cells containing half the original amount of genetic information. These cells are sex cells – sperm in males, eggs in females.

Meiosis is the form of eukaryotic cell division, which lead to:

– Reduction of the diploid chromosome set to the haploid set.

– Homologue recombination.

– Only takes place in germ cells of multicellular eukaryotes.

– Production of sperms and eggs.

– Involves two nuclear divisions rather than one.

Meiosis1

The first meiotic division is a reduction division (diploid → haploid) in which homologous chromosomes are separated.

P-I: Chromosomes condense, nuclear membrane dissolves, homologous chromosomes form bivalents, crossing over occurs

M-I: Spindle fibers from opposing centrosomes connect to bivalents (at centromeres) and align them along the middle of the cell

A-I: Spindle fibers contract and split the bivalent, homologous chromosomes move to opposite poles of the cell

T-I: Chromosomes decondense, nuclear membrane may reform, cell divides (cytokinesis) to form two haploid daughter cells.

Below the similarities and differences between Meiosis I, Meiosis 2:

Meiosis I	Meiosis II
Similarities	
Can only occur in eukaryotes	
G phase of interphase usually occurs first	
Production of daughter cells based on parent cell's genetic material	
Means of sexual reproduction in plants, animals, and fungi	
Four phases occur: prophase, metaphase, anaphase, telophase	
Differences	
Starts as diploid; ends as haploid	**Starts as haploid; ends as haploid**
Reductive division	**Equational division**
Homologous chromosome pairs separate	**Sister chromatids separate**
Crossing over happens	**Crossing over does not happen**
Complicated division process	**Simple division process**
Long duration	**Short duration**
Sister chromatids in prophase have convergent arms	**Sister chromatids in prophase have divergent arms**
Ends with 2 daughter cells	**Ends with 4 daughter cells**

ploidy: the number of sets of chromosomes in a cell.

Haploid: Haploid or monoploid is a cell or organism that has just a single copy of each chromosome.

Diploid: is a cell or organism that has paired or two sets of hromosomes, one from each parent.