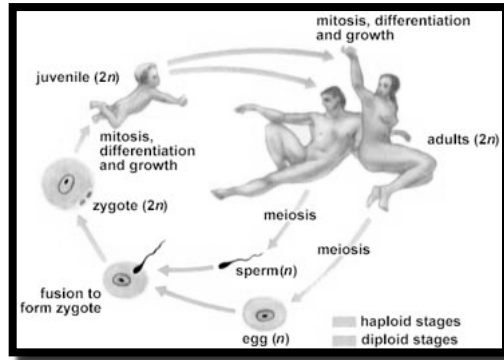


Meiosis



You simply cannot combine an egg and sperm if they contain the normal number of chromosomes

I. Overview

- A. Organisms must inherit a single copy of every gene from each parent**
 - 1. ∴ each individual organism inherits two complete sets of genes**
- B. When an organism produces reproductive cells (eggs and sperm) its two sets of genes must be separated from each other.**
 - 1. this separation is called meiosis**
 - a. exclusively eukaryotic, ∴ NOT a process for ?**
 - b. required by sexual, but not asexual, reproduction**



II. Chromosome Number

- A. Eukaryotic sexual reproduction results in organisms with two sets of chromosomes
 - 1. one each from the male and female parent
 - 2. the two sets are said to be homologous
 - a. chromosomes in one set have a version of themselves in the other set
- B. A cell with both sets of homologous chromosomes is said to be diploid (2N)
- D. A cell with one set of chromosomes is said to be haploid (N)
 - 1. gametes (ex: egg and sperm or ovule and pollen)

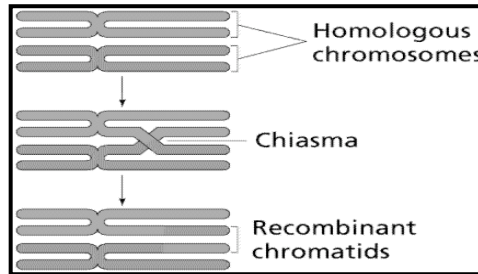


III. Phases of Meiosis

- A. Diploid cells destined to become gametes (germ cells) go through two rounds of cell division
- C. Before the first round of cell division - DNA replication occurs - *recall the S phase of the cell cycle*
- E. Meiosis I
 - 1. not like mitosis where the newly synthesized chromosomes line up to be separated into two new cells
 - 2. here the newly synthesized chromosomes pair up with their homologs forming a tetrad
 - 3. the tetrads may exchange portions of their chromatids: called crossing-over



4. crossing over results in the exchange of genes between homologous chromosomes and produces new combinations of genes



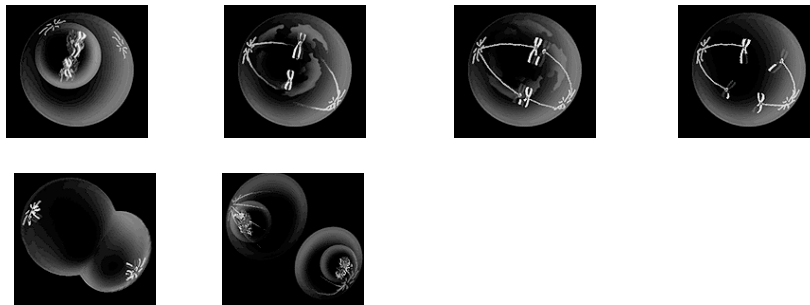
5. after crossing-over occurs, homologous chromosomes separate and two new diploid cells are formed - recall cytokinesis

6. these two new diploid cells have unique sets of genes



Images of Meiosis I

note the similarities and differences to mitosis



D. Meiosis II

1. performed by the two new cells produced in meiosis I
2. DNA does not replicate
3. prophase through cytokinesis occurs producing four haploid cells - two from each of the cells produced in meiosis I



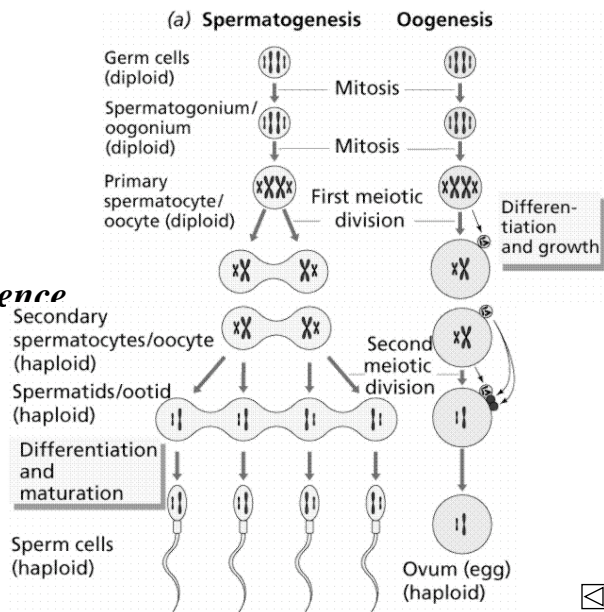
Males

vs.

Females

there is a difference

For animals, meiosis in males produces 4 sperm from every germ cell vs. one egg for females



The End