Sexual reproduction

L Mathias

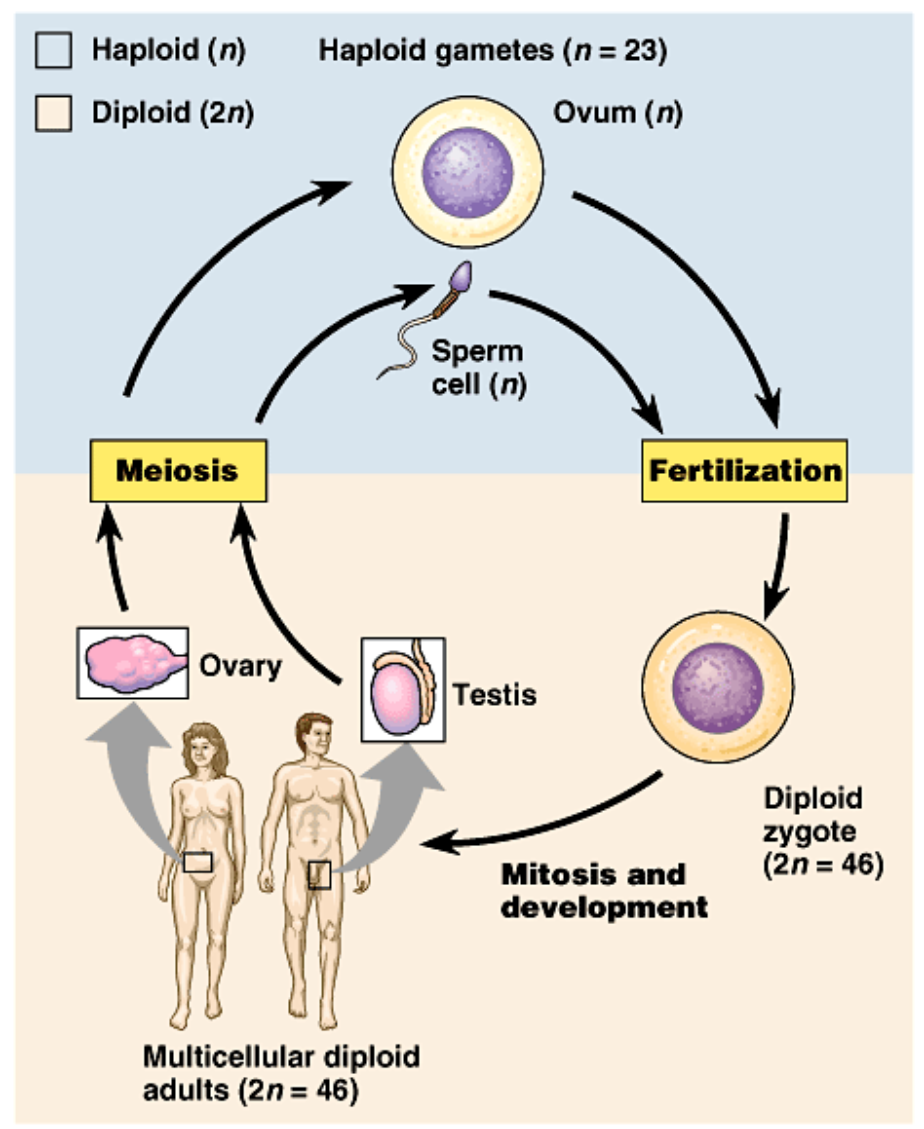
Sexual reproduction

- Sexual reproduction is the production of offspring from two parents using gametes. The cells of the offspring have two sets of chromosomes (one from each parent), so are diploid. Sexual reproduction involves two stages:

- Meiosis- the special cell division that makes haploid gametes

- Fertilisation- the fusion of two gametes to form a diploid zygote

Basic lifecycle of sexually reproducing organisms



Meiosis

- Meiosis is a form of cell division. It starts with DNA replication, like mitosis, but then proceeds with two divisions one immediately after the other. Meiosis therefore results in four daughter cells rather than the two cells formed by mitosis. It differs from mitosis in two important aspects

Meiosis 2

- The chromosome number is halved from the diploid number (2n) to the haploid number (n). This is necessary so that the chromosome number remains constant from generation to generation. Haploid cells have one copy of each chromosome, while diploid cells have homologous pairs of each chromosome.

Meiosis 3

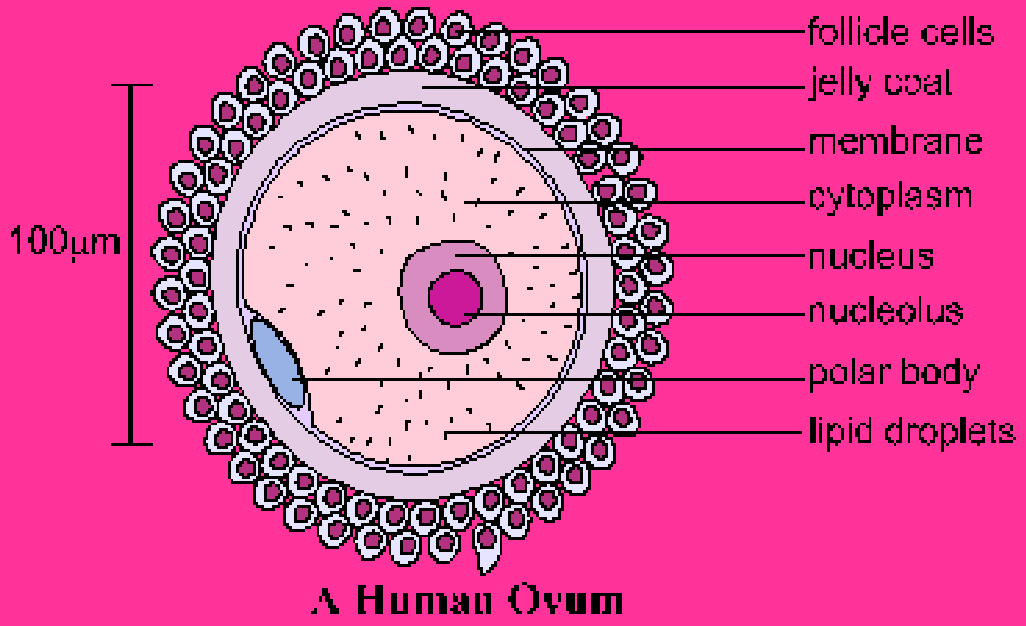
- The chromosomes are re-arranged during meiosis to form new combinations of genes. This genetic recombination is vitally important and is a major source of genetic variation. It means for example that of all the millions of sperm produced by a single human male, the probability is that no two will be identical.

What is the point of meiosis? To produce gametes

- The usual purpose of meiosis is to form gametes- the sex cells that will fuse together to form a new diploid individual.In all plants and animals the gametes are different sizes. This is called heterogamy

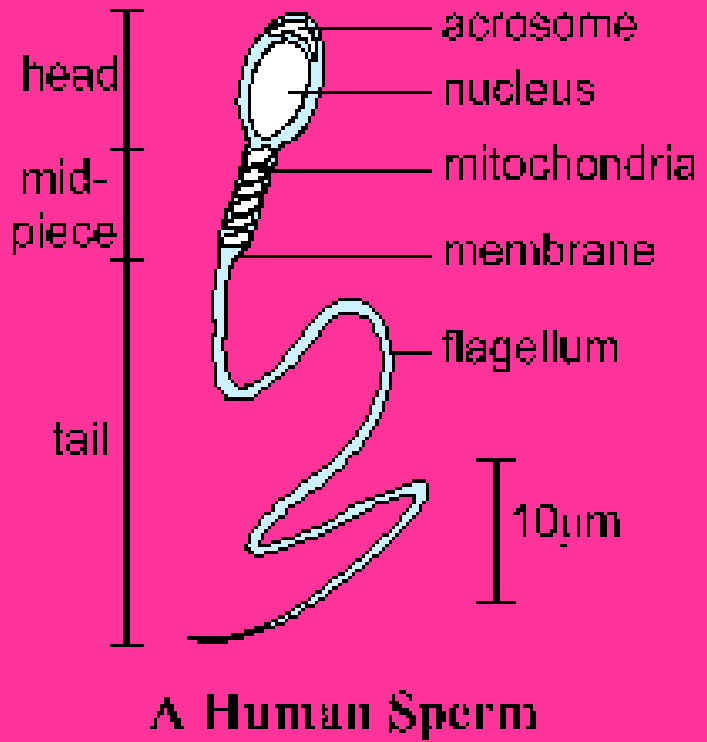
Female gametes

- Female gametes (ova or eggs in animals, ovules in plants)
- Fairly small numbers.
- Human females for example release about 500 ova in a lifetime.
- Larger
- Stationary
- They often contain food reserves (lipids, proteins, carbohydrates) to nourish the embryo after fertilisation



A Human Ovum

Male gametes



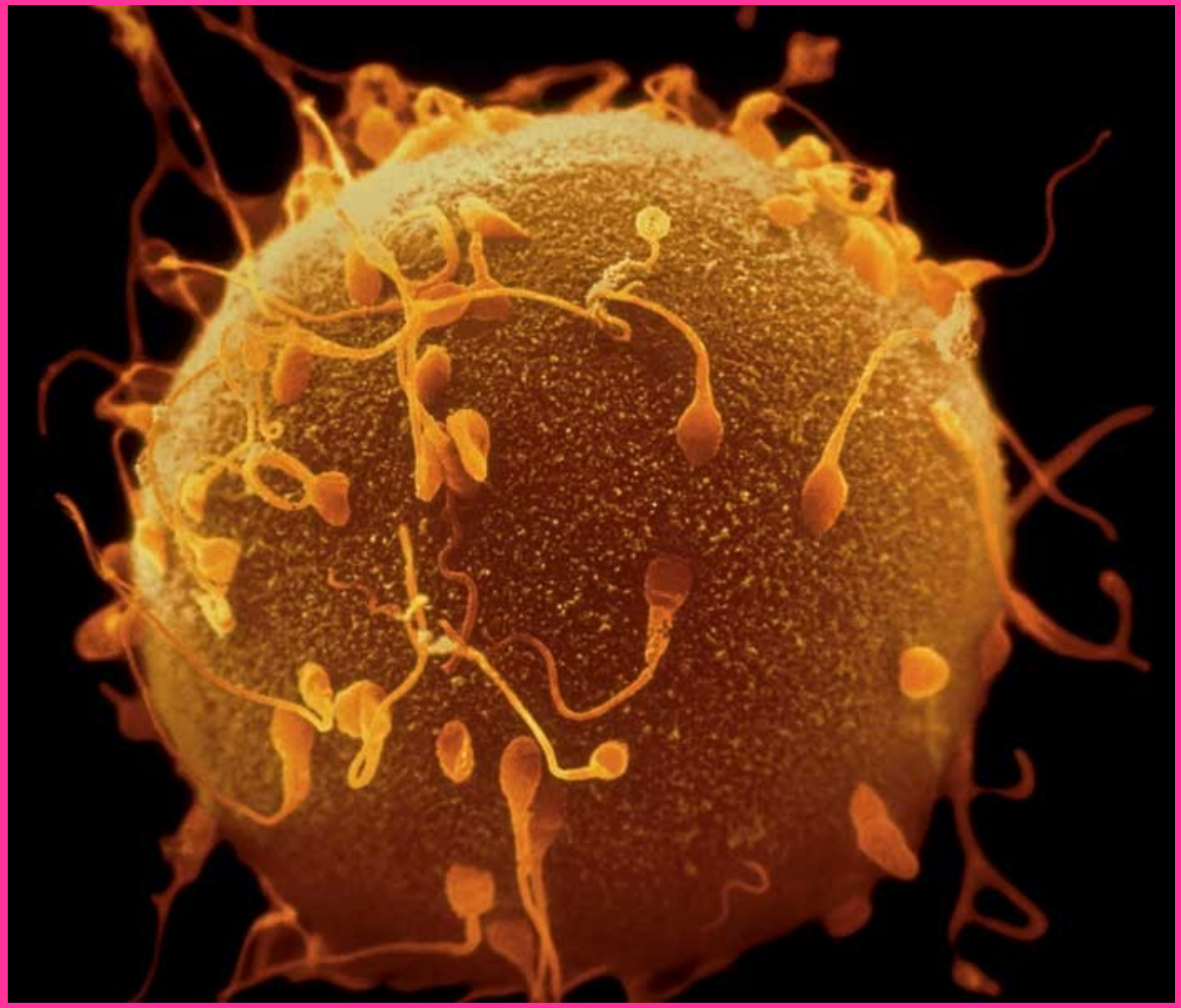
A Human Sperm

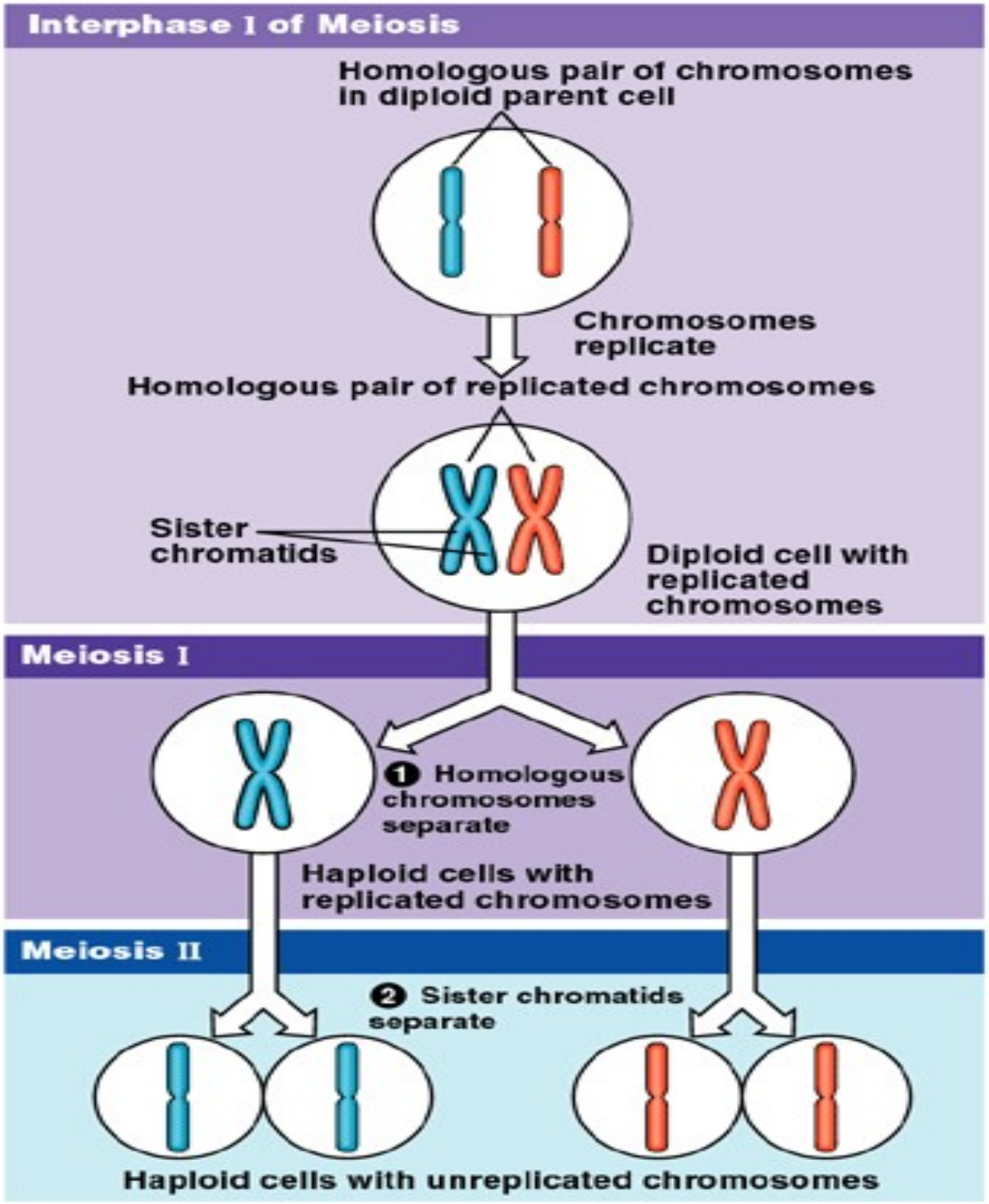
- Male gametes, very large numbers
- 100 million sperm per ejaculation
- smaller
- Motile (if they can propel themselves, mobile if they can be easily moved)



Fertilisation

Fertilisation





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