

Edexcel (B) Biology A-level

2.4 - Sexual reproduction in mammals

Flashcards

This work by [PMT Education](https://www.pmt.education) is licensed under [CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)



Name the 2 types of gametogenesis.



Name the 2 types of gametogenesis.

- Spermatogenesis to produce spermatozoa.
- Oogenesis to produce ova.



What are primordial germline cells?



What are primordial germline cells?

Diploid precursors to gametes.



Outline the stages of spermatogenesis.



Outline the stages of spermatogenesis.

primordial germline cell →

spermatogonia → primary

spermatocytes → secondary

spermatocytes → spermatids → **4**

spermatozoa



How do primary spermatocytes form?



How do primary spermatocytes form?

Primordial germline cells of seminiferous tubules of testes divide by mitosis, forming spermatogonia.

Growth period of spermatogonia without further division forms primary spermatocytes.



How do spermatids form?



How do spermatids form?

Primary spermatocytes undergo meiosis to form 4 undifferentiated haploid cells.

Meiosis I : diploid secondary spermatocytes.

Meiosis II : haploid spermatids.



How do spermatozoa form?



How do spermatozoa form?

Spermatids differentiate to gain flagellum, acrosome & many mitochondria.



Outline the stages of oogenesis.



Outline the stages of oogenesis.

Primordial germ cell → oogonia →
primary oocyte → secondary oocyte &
polar body → ootid & polar bodies → **1**
ovum.



How do primary oocytes form?



How do primary oocytes form?

Primordial germline cells in the ovaries (and oviduct) divide by mitosis, forming oogonia.

Growth period of oogonia without further division forms primary oocytes, which remain in prophase I in follicles until puberty.



What happens during the first meiotic division of oogenesis?



What happens during the first meiotic division of oogenesis?

1 secondary oocyte with all the cytoplasm forms.

1 polar body buds off and sticks to the oocyte.



What happens during the second meiotic division of oogenesis?



What happens during the second meiotic division of oogenesis?

Secondary oocyte divides into haploid ootid & polar body.

Polar body divides in 2.

Overall 3 polar bodies form. They degenerate as ootid develops.



How does an ovum form?



How does an ovum form?

Meiotic division in utero halts at prophase. Fertilisation triggers influx of Ca^{2+} . This stimulates meiosis II to form ovum.



Describe the structure of an ovum.



Describe the structure of an ovum.

Outer layer of **follicle cells**.

Zona pellucida: coating above cytoplasm prevents polyspermy & hardens when **cortical granules** release chemicals.

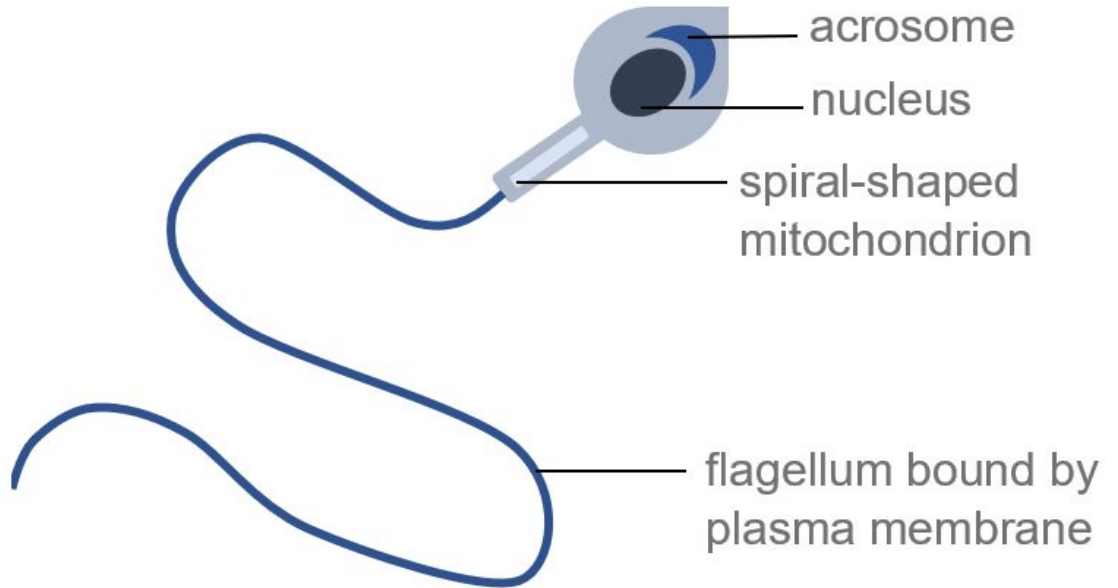
Haploid nucleus: fertilisation restores diploid chromosome number.



Describe the structure of a
spermatozoon.



Describe the structure of a spermatozoon.



Explain what happens during fertilisation.



Explain what happens during fertilisation.

1. Enzymes in acrosome of sperm head digest zona pellucida.
2. Sperm head fuses with ovum cell membrane, allowing sperm nucleus to enter.
3. Cortical reaction causes zona pellucida to harden, preventing polyspermy.
4. Nuclei fuse, forming a diploid zygote.



Outline the stages of early embryo development.



Outline the stages of early embryo development.

zygote → morula → blastocyst →
implantation



How does a blastocyst form?



How does a blastocyst form?

Several mitotic divisions of zygote produce morula (solid ball of cells).

Morula divides further then undergoes differentiation and cavity formation.



Describe the structure of a blastocyst.



Describe the structure of a blastocyst.

Inner cell mass develops into embryo.

Outer layer (trophoblast) develops into placenta.

Fluid filled cavity (blastocoele).



What happens during implantation?



What happens during implantation?

1. Blastocyst breaches surrounding jelly coat, so it can attach to endometrium.
2. Release of autocrine hormones & digestive enzymes triggers implantation into uterine wall.
3. Growing embryo gains nutrients and oxygen from endometrial tissue fluid.

