

Fertilisation

Fertilisation is when male and female gametes fuse

- This is the exact moment when the nuclei of the male and female gametes fuse
- Each gamete has half the number of chromosomes, fertilisation creates a cell with the full number of chromosomes which is a zygote
- Zygote contains two sets of chromosomes – paternal and maternal, combining this make offspring that are genetically unique

Mammal's fertilisation

1. Sperm are deposited high up the female vagina close to the entrance of the cervix
2. They work their way through the cervix and uterus and into one of the oviducts
3. The sperm swims towards the egg cell in the oviduct
4. When the sperm makes contact with zona pellucida the acrosome reaction occurs, digestive enzymes are released
5. The enzymes digest the zona pellucida and then the sperm can move through to the membrane
6. The sperm head fuses with the membrane, this triggers the cortical reaction, this is when the cortical releases the contents of vesicles called cortical granules
7. This thickens the zona pellucida and stops it being penetrable to other sperm
8. The sperm nucleus enters the egg cell and the tail is discarded
9. The nucleus of the sperm fuses with the nucleus of the egg cell, this is fertilisation

Flowering plant's fertilisation

1. A pollen grain lands on the stigma, it absorbs water and splits open
2. A pollen tube grows out of the pollen grain down the style, it contains three nuclei – one tube nucleus and two male gamete nuclei (tube nucleus releases digestive enzymes to make a way through for the pollen tube)
3. When the tube reaches the ovary it grows through the micropyle and into the embryo sac within the ovule
4. In the embryo sac the tube nucleus divides and the tip of the pollen tube bursts and releases the two male nuclei
5. One nuclei fuses with the egg nucleus to form the embryo and the other fuses with the polar nuclei to form the endosperm
6. This is double fertilisation

Practice questions

1. What is fertilisation?
When a male and female gamete fuse to form a zygote
2. How many nuclei are found in pollen tubes?
3
3. What is the purpose of the endosperm
It acts as a food store for the embryo
4. What type of plant does double fertilisation occur in?
Flowering plants