

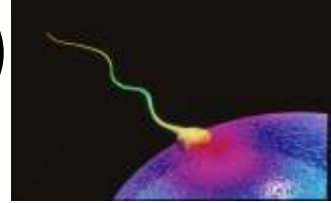


REPRODUCTION

Re-Production
of Offspring
by Parents

UNDERSTANDING REPRODUCTION

- **Fertilisation** is when a half-cell *sperm* fuses with a half-cell *ovum* to form a single-celled *zygote*. Fertilisation can be External, or Internal. (*Details to follow.*)
- **Embryo development:**
 - **OviPary:** the egg is laid, and its embryo develops in it, outside the body of the mother. *Birds. Frogs.*
 - **OvoViviPary:** The fertilised egg develops in the mother's body, where it hatches, and is born. *Puff adder snake.*
 - **ViviPary:** The embryo develops in the mother's body, and is then born. *Mammals.*



The more capable the parents are to look after their child, the fewer eggs they need to produce. (*Frogs vs. Birds*).

FERTILISATION

EXTERNAL FERTILISATION

The sperm is released onto the eggs, **outside** the body. Usually in water. *Some fish.*

Many eggs do not get sperm, many are eaten. So, many eggs need to be laid.

INTERNAL FERTILISATION

The sperm is released into the female's body, then swims to the egg. *Humans.*

This protection allows some marine & terrestrial animals to rely on fewer eggs.

DEVELOPMENT

PRECOCIAL BIRDS

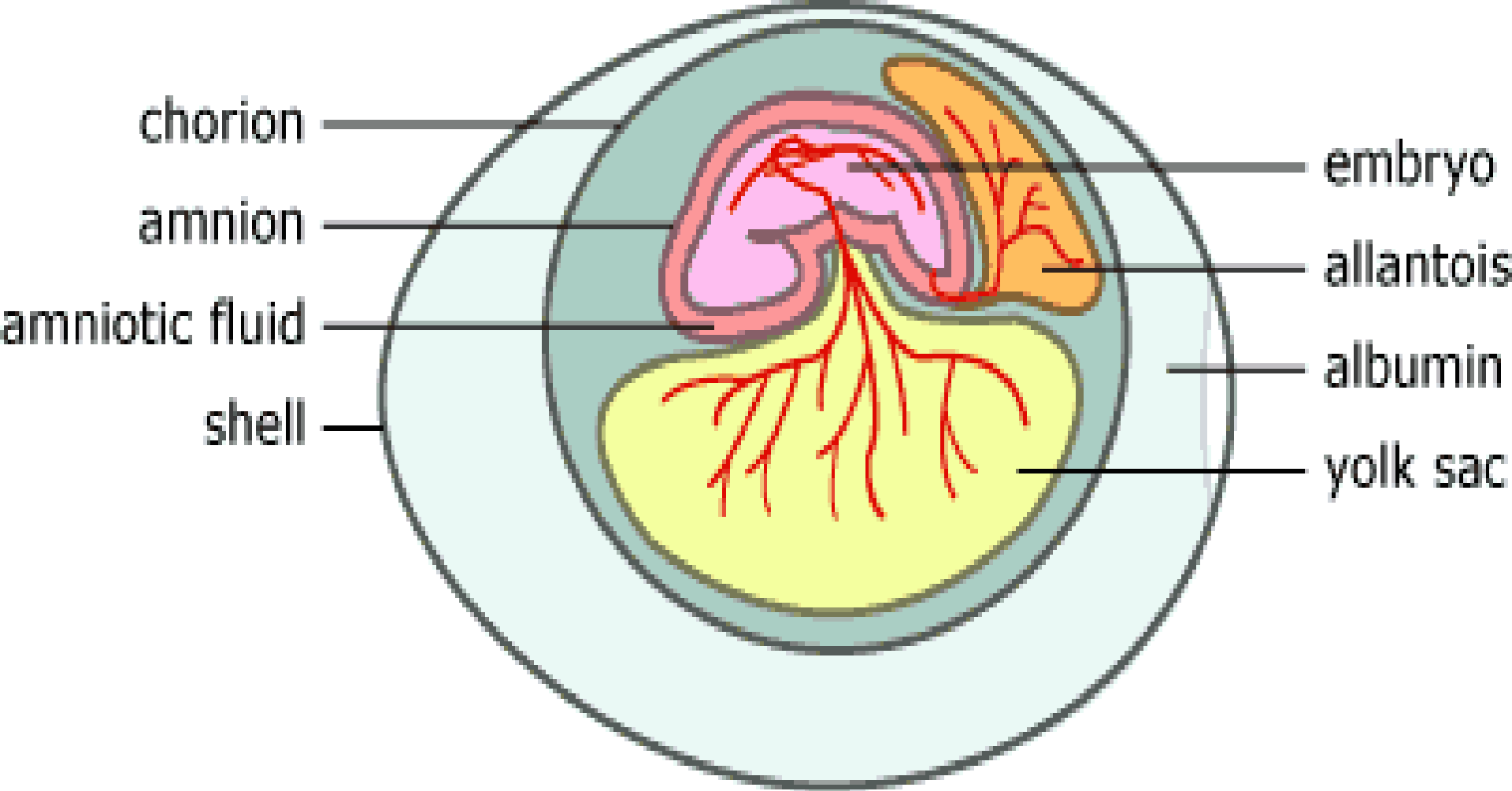
Build nests on the ground.

Big eggs, big chicks, independent soon after hatching.

ALTRICIAL BIRDS

Nests at altitude (in trees).

Small egg, small chick, dependent on parents for long.



THE AMNIOTIC EGG of Birds and Reptiles

AMNION membrane around **AMNIOTIC FLUID** in which **EMBRYO** forms.

ALLANTOIS collects nitrogenous excretion from **EMBRYO**.

YOLK provides **NUTRIENTS**. **ALBUMIN** gives **PROTEIN & WATER**.



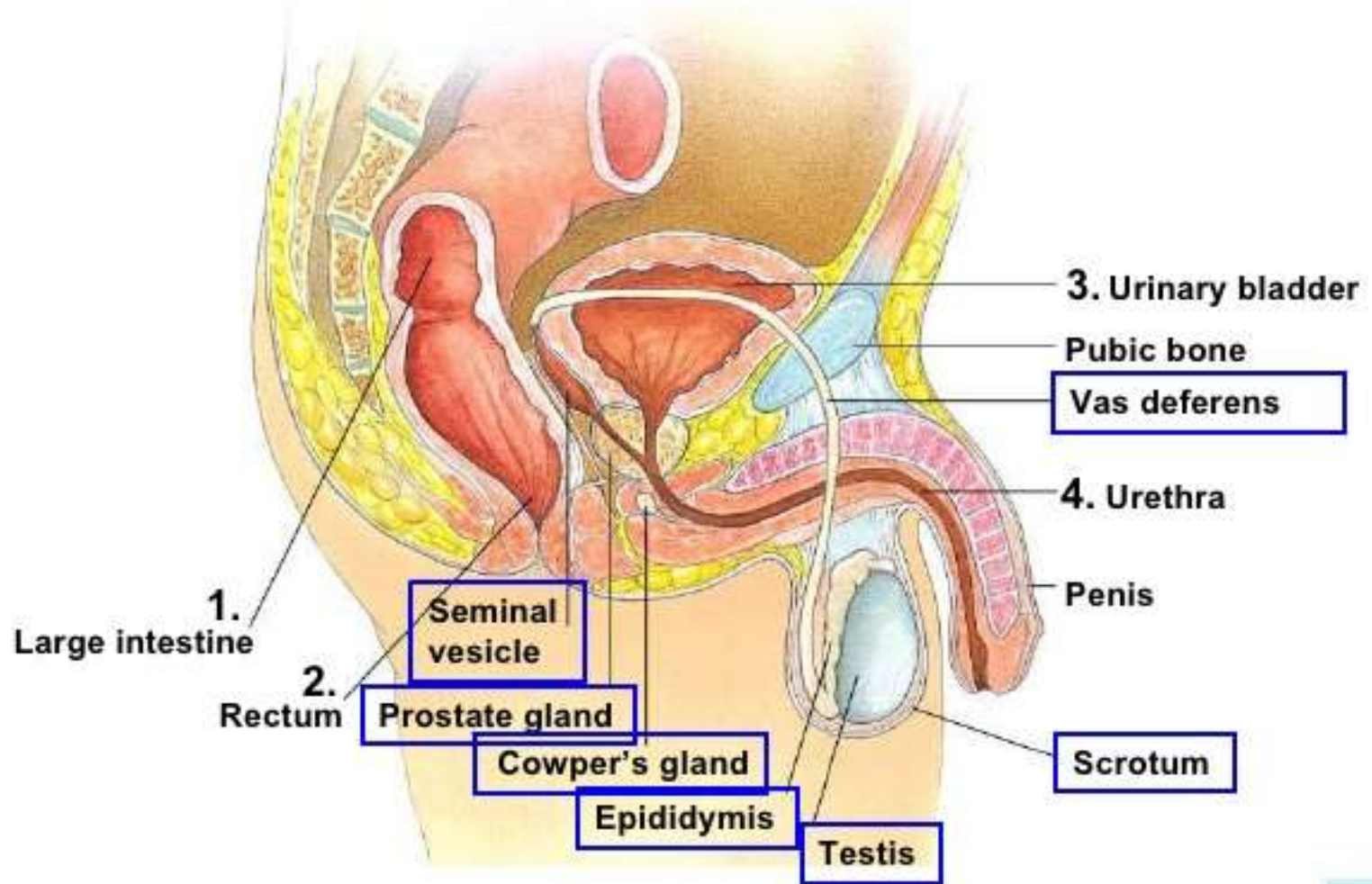
HUMAN REPRODUCTION

MEIOSIS produces GAMETES:

MALE SPERM + FEMALE OVUM

Zygote → Embryo → Foetus → Baby

The Male Reproductive System



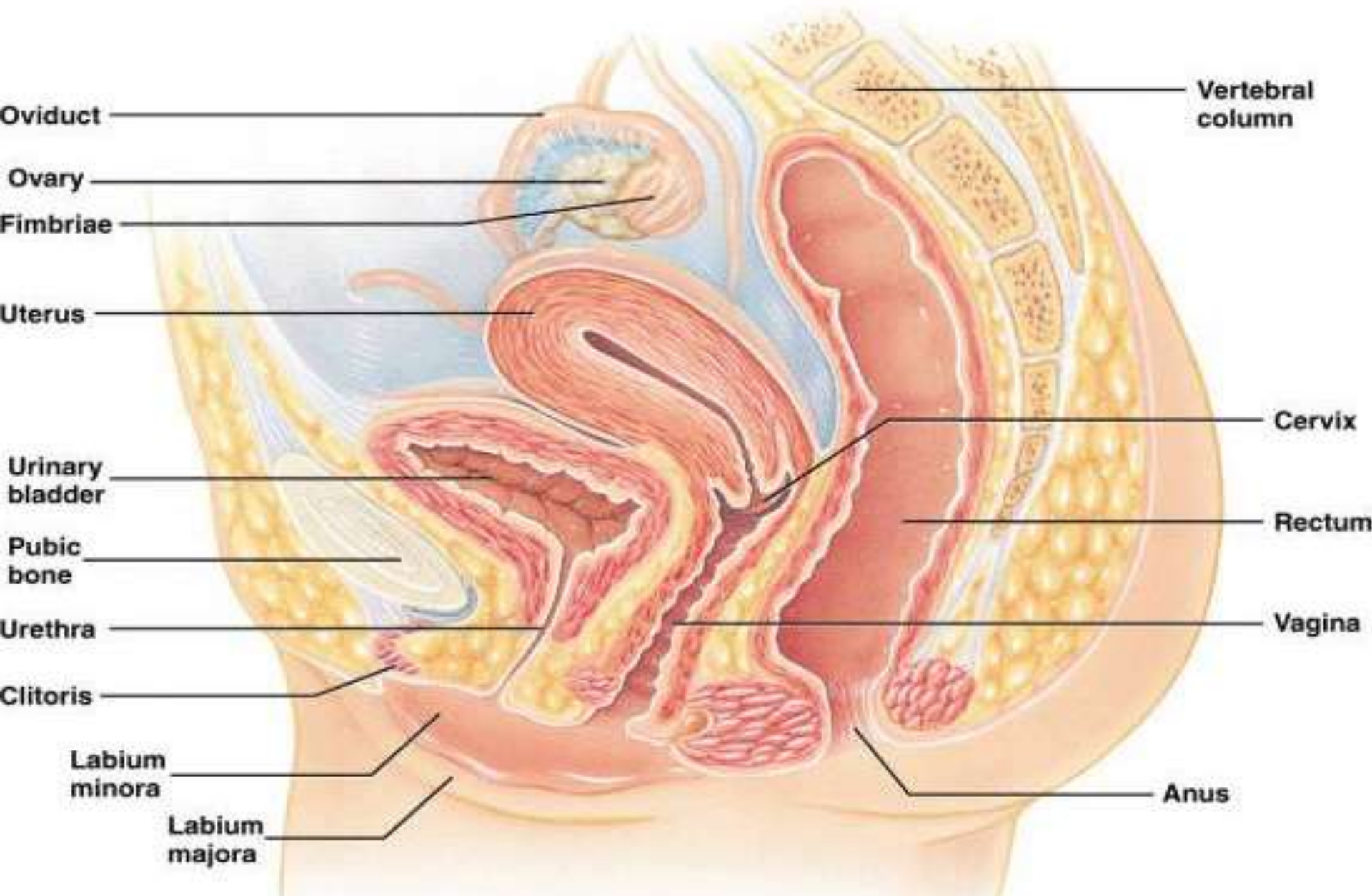
HUMAN MALE



- Scrotum – bag that encloses testis.
- Testis = seminiferous tubules → sperm, hormone.
(See Role of the Hormone Testosterone, P. 22)
- Epididymis – stores sperm for instant use.
- Vas deferens – passage for released sperm.
- Seminal vesicle – sperm enters semen. (Food!)
- Ejaculatory duct – squirts semen & sperm out.
- Prostate gland – activates the sperm.
- Cowper's gland – neutralises uric acid later.
- Urethra – passageway through the penis.



The reproductive anatomy of the female

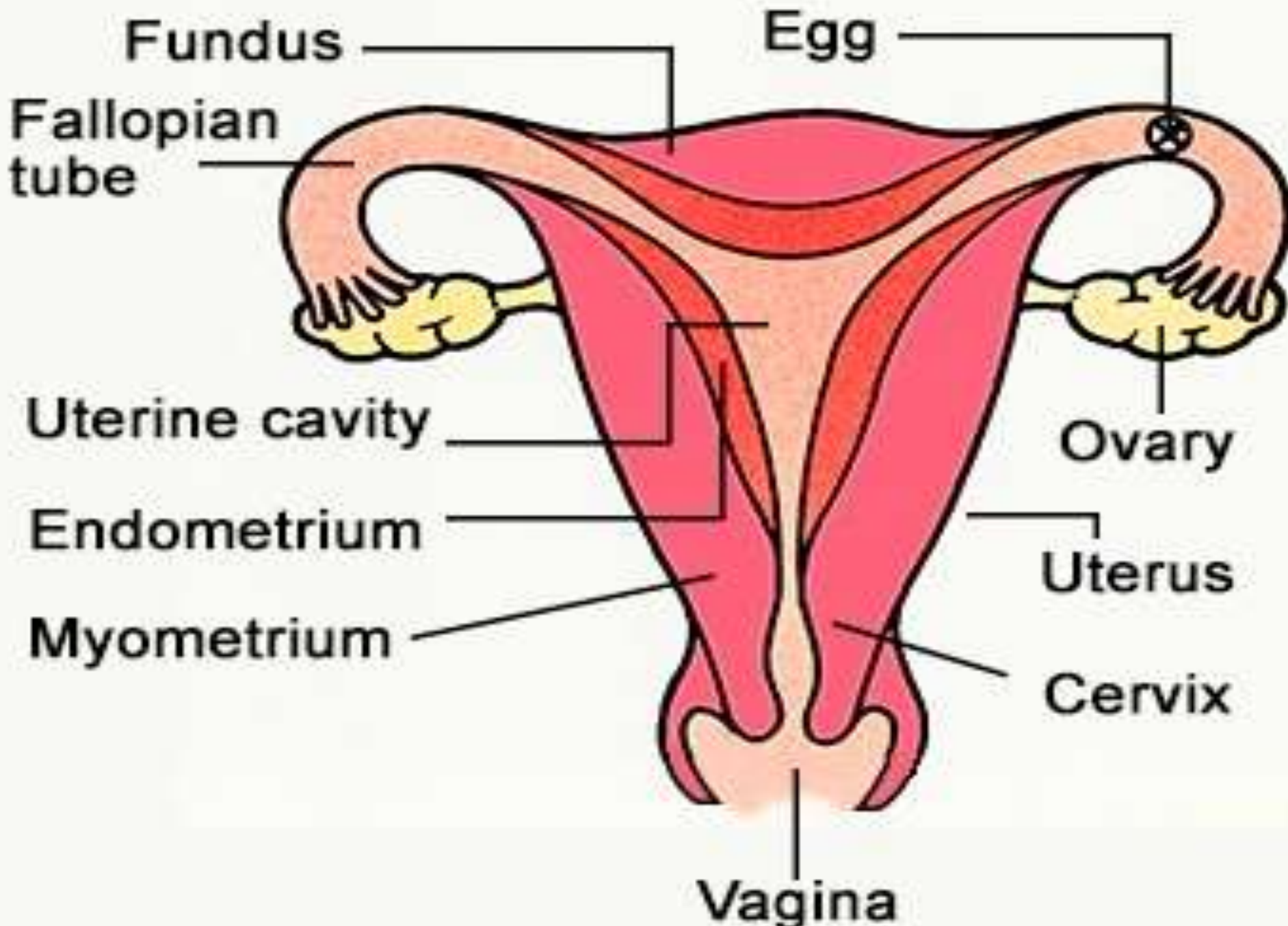


HUMAN FEMALE



- Vulva – Folded skin. External. Internal. (Sensory *clitoris*)
- Vagina – tube: for penis, blood, & baby's birth
- Cervix – entrance between vagina & uterus.
- Uterus = womb: where the offspring develop
- Endometrium = walls of the uterus.
- Ovary – produces one ovum (egg) each month
- Fallopian tube – passage for egg from ovary to womb. Fertilization can happen only in **this** tube.





WHAT IS PUBERTY?



- Adolescence is when sex organs develop in boy and girl.
- **Usually**, it happens in early- to mid-teens.
- Chemical, physical, psychological changes take place.
- After this, their bodies are capable of making children – **BEWARE**: Their minds, abilities and conditions (financial and social) are **NOT** yet ready. And **that's** where our **CONTROL** as humans makes us superior to animals.



GametoGENESIS (CREATION of GAMETES)

SPERMATOgenesis (in Males)

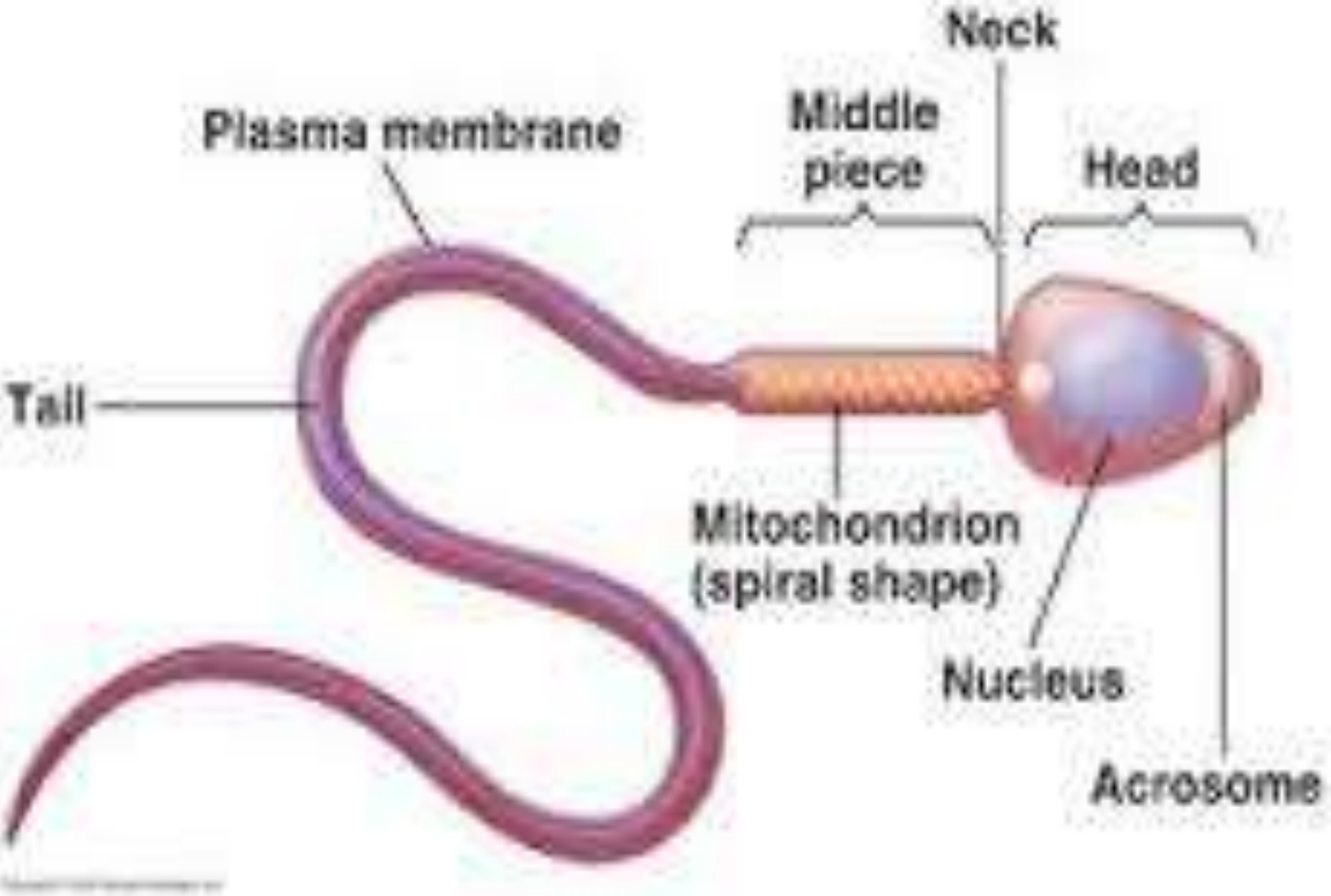
OVO = OOgenesis (in Females)

MEIOSIS: $2n \rightarrow n + n$

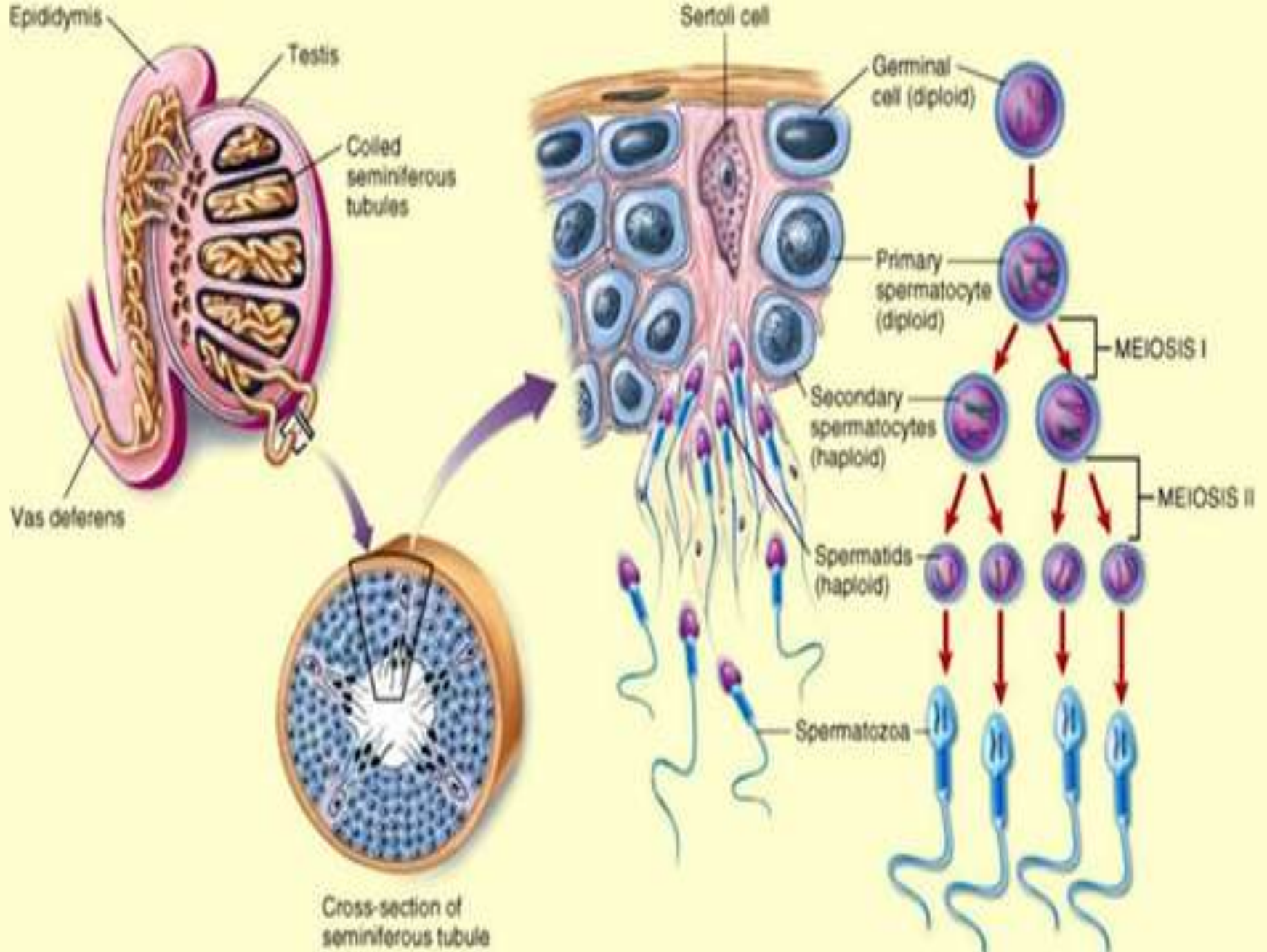
SPERMATogenesis



- The testis is made of **Seminiferous Tubules**, lined by **germinal epithelium** cells.
- **Pituitary gland** releases **Luteinizing Hormone**.
- This gets **testosterone** from the *Cells of Leydig*.
- Each germinal epithelium cell undergoes **meiosis** to produce *sperms*.
(See this process, and sperm structure, page 24).
- *Cells of Sertoli* **nourish** them while developing.



STRUCTURE of a SPERM CELL



SPERMATOGENESIS