

one cycle rebuilds a lining every month, hoping this is the one that stays



Male reproductive system

Testes

paired, inside the scrotum, kept slightly cooler than body temperature (about 2-2.5°C)

Epididymis

long coiled tube on each testis, stores and matures sperm

Vas deferens

ascends from the epididymis, joins the ejaculatory duct

Seminal vesicle

adds a fructose-rich fluid, roughly 60% of the semen's volume

Prostate

adds a thin, milky, alkaline fluid

Bulbourethral gland

a pair, pre-ejaculatory lubrication

Inside the testis *

- each testis has about 250 lobules; each lobule holds 1-3 coiled seminiferous tubules
- tubule lining: spermatogonia (germ cells, undergo spermatogenesis) and Sertoli cells that nourish them ('nurse cells')
- outside the tubules, in the interstitial spaces, sit the Leydig cells, which secrete testosterone
- two jobs at once: sperm production inside the tubules, hormone production between them

Spermatogonium

$2n$

germ cell lining the tubule, multiplies by mitosis



Primary spermatocyte

$2n$

grows in size, enters meiosis I



Secondary spermatocytes

n

two of them, complete meiosis II



Spermatids

n

four haploid cells per original spermatogonium



spermiogenesis remodels each spermatid into a sperm: packaging, not another division

Hormonal control of spermatogenesis

- hypothalamus releases GnRH, driving the anterior pituitary
- LH acts on Leydig cells, stimulating testosterone synthesis
- FSH acts on Sertoli cells, helping spermiogenesis along
- testosterone itself then sustains the rest of spermatogenesis

Structure of a sperm

- head: haploid nucleus plus the acrosome, enzymes that help it penetrate the egg's coverings
- middle piece: mitochondria packed spirally, supplying energy for the tail
- tail: whip-like, gives the sperm its motility; without it, fertilization doesn't happen
- sperm plus accessory gland secretions = semen, mildly alkaline and fructose-rich