

Reproductive Anatomy and Physiology

Reproductive Anatomy & Physiology – Study Notes

1. Overview

- **Purpose of the reproductive system**

- Production of gametes (sperm & ova)
- Synthesis and secretion of sex hormones
- Facilitation of fertilization, implantation, and development of offspring

- **Two divisions**

1. **Gonads** – testes (male) and ovaries (female) – primary organs for gamete production and hormone synthesis.
 2. **Accessory (duct) structures** – transport, storage, and support of gametes; also sites of hormone action.
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2. Male Reproductive System

Structure	Location	Primary Functions	Key Histology / Physiology
Testes	Scrotum (outside abdomen)	• Spermatogenesis • Testosterone production	• Seminiferous tubules (spermatogenic epithelium) • Leydig cells (interstitial, androgen synthesis)
Epididymis	Posterior to each testis	• Sperm maturation (motility, membrane changes) • Storage	Pseudostratified columnar epithelium with stereocilia
Vas deferens (ductus deferens)	Muscular tube to pelvic cavity	• Propels sperm during ejaculation (peristalsis)	Thick muscular wall, thick collagenous adventitia
Seminal vesicles	Posterior to bladder	• Secrete ~60% of ejaculate volume (fructose, prostaglandins, clotting proteins)	Glandular acini with columnar epithelium

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Structure	Location	Primary Functions	Key Histology / Physiology
Prostate gland	Around urethra, below bladder	• Alkaline fluid (zinc, citrate) to neutralize vaginal acidity • PSA (seminal plasma liquefaction)	Glandular tissue with basal and secretory cells
Bulbourethral (Cowper's) glands	Posterior to urethra, within urogenital diaphragm	• Pre-ejaculate (lubrication, mucus)	Small tubulo-alveolar glands
Penis	External organ	• Delivery of sperm & seminal fluid • Erectile function (corpora cavernosa)	Erectile tissue with sinusoidal spaces, rich vascular supply
Urethra	Passage through penis	• Conduit for semen & urine (separate phases)	Stratified columnar epithelium (proximal) ? pseudostratified columnar (mid) ? stratified squamous (distal)

Hormonal Regulation (Male)

Hormone	Source	Target	Effect
GnRH	Hypothalamus	Anterior pituitary	Stimulates LH & FSH release
LH	Anterior pituitary	Leydig cells	? Testosterone
FSH	Anterior pituitary	Sertoli cells	Supports spermatogenesis
Testosterone	Leydig cells	Multiple (Sertoli cells, secondary sexual traits)	Maintains spermatogenesis, libido, muscle mass
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3. Female Reproductive System

Structure	Location	Primary Functions	Key Histology / Physiology
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Ovaries

Lateral pelvic
walls

- Oogenesis (development of oocytes)
- Estrogen & progesterone synthesis
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