

Light microscope image of human sperm.
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Overview of the Male Reproductive System

Center for
Educational Outreach
Baylor College of Medicine



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Image Reference

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Key Words

reproductive system, male

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Major Components of the System

- The external male reproductive structure consists of the scrotum and penis.
- The male gonads, the testes, are held in the scrotum.
- The testes possess hormone-producing cells and sperm-forming tubules.

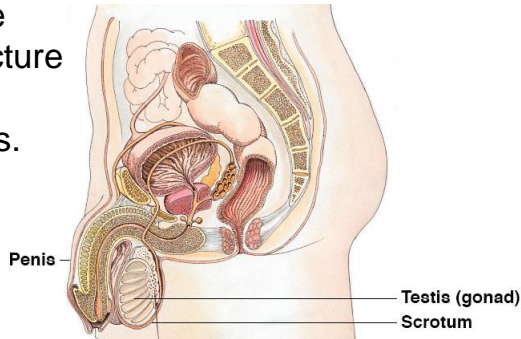


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Major Components of the System

The external male reproductive organs are the scrotum and the penis. The internal reproductive organs include gonads that produce sperm and reproductive hormones; accessory glands that release products essential for sperm movement; and ducts that transport the sperm and glandular secretions.

Within the testes are Leydig cells, which produce testosterone and other sex hormones. The testes also house the seminiferous tubules, where sperm are formed.

References

1. Campbell, N.A., and Reece, J.B. (2002). *Biology, 6th Edition*. San Francisco, CA: Pearson Benjamin Cummings.
2. Clark, Joe O.E. (1999). *A Visual Guide to the Human Body*. London: Barnes and Noble, Inc.

Image Reference

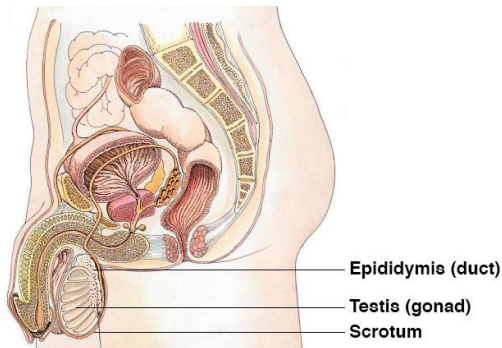
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Key Words

reproductive system, male, gonads, hormones, penis, scrotum, sperm, testes

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Testes



- The male gonads, the testes, are found in the scrotum.
- Sperm are manufactured in the testes and then travel to be stored in the epididymis.

Testes

The male gonads, the testes, are located in the cool environment of the scrotum, because a lower temperature is necessary for spermatogenesis. The testes consist of many highly-coiled seminiferous tubules, which are the site of sperm production. Leydig cells, which produce testosterone and other androgens, are also found in the testes.

References

Campbell, N.A., and Reece, J.B. (2002). *Biology, 6th Edition*. San Francisco, CA: Pearson Benjamin Cummings.

Clark, Joe O.E. (1999). *A Visual Guide to the Human Body*. London: Barnes and Noble, Inc.

Image Reference

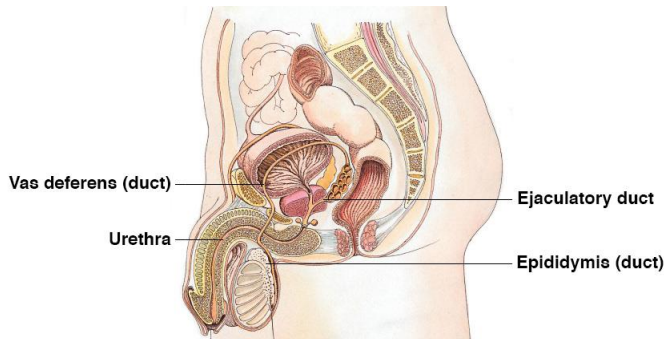
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Key Words:

reproductive system, male, epididymis, gonads, scrotum, sperm, testes

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Ducts



During ejaculation, sperm is transferred in the form of semen along a system of ducts and out of the urethra.



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Ducts

Sperm pass from the seminiferous tubules of a testis into the coiled tubules of the epididymis. During this journey, sperm complete their maturation and become motile. During ejaculation, the sperm are propelled from the epididymis through the muscular vas deferens and into the urethra.

References

Campbell, N.A., and Reece, J.B. (2002). *Biology, 6th Edition*. San Francisco, CA: Pearson Benjamin Cummings.

Clark, Joe O.E. (1999). *A Visual Guide to the Human Body*. London: Barnes and Noble, Inc.

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Key Words

reproductive system, male, epididymis, ejaculatory duct, sperm, urethra, vas deferens

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Accessory Glands

The accessory glands of the male reproductive system produce semen and help maintain an environment needed for sperm to thrive.

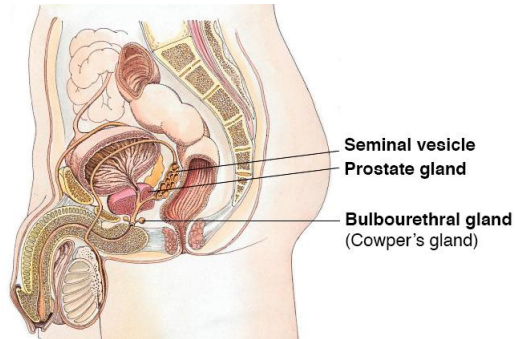


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Accessory Glands

Accessory glands add secretions to the semen. A pair of seminal vesicles contribute about 60% of the total volume of the semen, a thick, yellowish, alkaline fluid. Semen contains sugar fructose, which provides most of the energy used by the sperm.

The prostate gland secretes its products directly into the urethra through several small ducts. This fluid is thin and milky, and contains anticoagulant enzymes and citrate, a sperm nutrient.

The bulbourethral glands, also called the Cowper's glands, secrete a clear mucus that neutralizes any acidic urine remaining in the urethra before ejaculation.

References

1. Campbell, N.A., and Reece, J.B. (2002). *Biology, 6th Edition*. San Francisco, CA: Pearson Benjamin Cummings.

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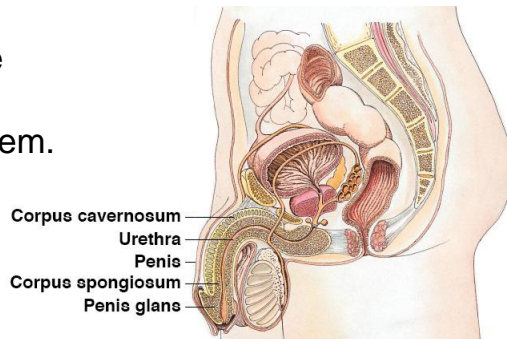
Key Words

reproductive system, male, accessory glands, Bulbourethral gland, Cowper's gland, prostate gland, semen, seminal vesical, sperm

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Penis

- The penis is an external structure of the male reproductive system.
- Its main purpose is to transfer sperm during intercourse.



Penis

The urethra is a tube that transfers and drains both the male excretory and the reproductive systems. It runs through the penis and opens to the outside at the tip of the penis.

The corpus cavernosa (spongy erectile tissues) expands with blood during an erection. The corpus spongiosum (spongy, pliable tissues), prevents the urethra from closing during an erection.

References

- 1.Campbell, N.A., and Reece, J.B. (2002). *Biology, 6th Edition*. San Francisco, CA: Pearson Benjamin Cummings.
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- 3.Corpus cavernosum penis. Wikipedia CC-BY-SA 3.0.
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4. Corpus spongiosum penis. Wikipedia CC-BY-SA 3.0.
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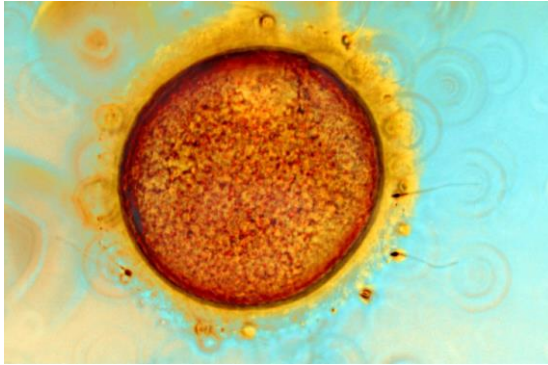
Key Words

reproductive system, male, corpus cavernosum, penis, penis glans, sperm, urethra

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Functions of the System

- Production, storage and transfer of sperm.
- Production of androgens (male hormones).



Human ovum (egg) and sperm. The ovum is much larger than the sperm and is surrounded by protective cumulus cells around the outside surface (yellow). The head of the sperm carries special enzymes to dissolve the egg coat, which is required in order to fertilize the egg.

Functions of the System

The seminiferous tubules are the site of sperm production and development within the testes. Once sperm have reached maturity, they are transferred to, and stored in the epididymis.

Sperm are relatively simple cells consisting of a head, body and tail. The head encloses a compact nucleus and is capped by a vesicle, called a acrosome, which contains enzymes that aid in the penetration of the protective layers surrounding the egg. The body and tail propel the sperm. Within the tail is a flagellum, while inside the body are a centriole—which acts as a basal body for the flagellum—and mitochondria which generate the energy needed for the flagellar movement that transports the sperm during sexual intercourse.

An interplay of various hormones triggers and controls sperm production, and a male can produce as many as 12 trillion sperm during a lifetime. The principal male sex hormones are androgens, of which testosterone is the most important. Androgens are directly responsible for the primary and secondary sex characteristics of males. They also are potent determinants of behavior in mammals, and are responsible for increases in general aggressiveness.

Hormones from the anterior pituitary and hypothalamus control both androgen secretion and sperm production by the testes.

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- 1.Campbell, N.A., and Reece, J.B. (2002). *Biology, 6th Edition*. San Francisco, CA: Pearson Benjamin Cummings.
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Image Reference

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Note: This image was taken from a failed human IVF procedure.

Key Words

reproductive system, male, androgen, enzymes, fertilization, hormones, ovum, sperm

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