
#424364

Topic: Gametogenesis

Could the number of eggs or young ones produced by an oviparous and viviparous mother be equal? Why?

Solution

In oviparous animals, young ones develop outside the mother body and are prone to harsh climatic conditions and predators. To compensate, oviparous females lay a number of eggs each time. In viviparous animals, young ones are developed inside the female body and one or a few eggs are produced per cycle. So, number of eggs produced by oviparous and viviparous animals can not be equal.

#462838

Topic: Female reproductive system

What is the term used for secretions of endocrine glands responsible for changes taking place in the body?

Solution

Hormones are chemical substances which are secreted by endocrine glands. They are responsible for changes taking place in the body.

#462841

Topic: Female reproductive system

What is menstruation? Explain.

Solution

Monthly bleeding in women seen after the onset of puberty is called as menstruation. Girls usually start having menstrual periods between the ages of 11 and 14. It is the flow of blood and tissue from the lining of the uterus. This happens when the released ovum is not fertilized. This unfertilized ovum is then sloughed off along with the uterine lining as the woman bleeds.

#462846

Topic: Female reproductive system

What are sex hormones? Why are they named so? State their function

Solution

Hormones that control the growth and development of secondary sexual characters are called as sex hormones. These hormones are produced in males and females under the influence of action of the pituitary gland.

Sex hormone in the male is testosterone and sex hormone in the female are oestrogens.

1. Testosterone: This hormone functions in male and brings about the growth and development of testes. This hormone is also responsible for the appearance of beard and hoarseness of voice.
2. Oestrogen: This hormone functions in female and is responsible for the development of secondary sexual characters, such as enlargement of breast and development of reproductive organs.

#462856

Topic: Fertilization

Describe the process of fertilization in human beings.

Solution

Fertilization is the biological process in which fusion of gametes of two different sexes, i.e., male and female takes place.

Internal fertilization occurs in human being. One egg is released from the ovary and is transferred to the fallopian tube during each ovulation cycle. The sperm travels to the egg through the fallopian tube. Fertilization also takes place in the fallopian tube.

#462861

Topic: Fertilization

Give two differences between a zygote and a foetus.

Solution

Zygote- Zygote is the result of fertilization, it is fusion of male and female gamete. It is unicellular in nature.

Foetus- Zygote undergoing multiple cellular division and reaching a stage where it starts resembling a human structure is called as a foetus. It is multicellular in nature.

#462863

Topic: Female reproductive system

In which female reproductive organ does the embryo get embedded?

Solution

The very early stage of development in pregnancy is implantation stage. In this stage, the wall of the uterus is adhered by the embryo. The prenatal development at this stage that the conceptus is a blastocyst. The foetus receives oxygen and nutrients from its mother that helps it to grow due to this type of adhesion.

#462865

Topic: Fertilization

Differentiate between internal fertilization and external fertilization

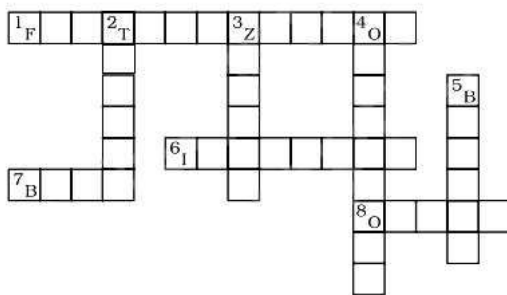
Solution

Internal fertilization is the type of fertilization that takes place inside the body. In this type of fertilization very few number of eggs are formed. For example- crocodile, bird, mammals.

External fertilization is the type of fertilization that takes place out of the body. In this type of fertilization, the yield of egg is high. For example- fish and frog.

#462867

Topic: Female reproductive system



Complete the cross-word puzzle using the hints given below.

Across

1. The process of the fusion of the gametes.
6. The type of fertilization in hen.
7. The term used for bulges observed on the sides of the body of *Hydra*.
8. Eggs are produced here.

Down

2. Sperms are produced in these male reproductive organs.
3. Another term for the fertilized egg.
4. These animals lay eggs.
5. A type of fission in *Amoeba*.

Solution**Across**

- 1) Fertilization is the fusion of male gamete and female gamete to initiate the development of a new individual organism.
- 6) Internal fertilization is the union of an egg cell with a sperm during sexual reproduction inside the body of a parent. Internal fertilisation take place in hen.
- 7) Budding is a type of asexual reproduction that occurs in Hydra in which a part of the organism starts bulging out and develops into a separate individual.
- 8) Ovary is an organ found in the female reproductive system that produces the egg/ ovum.

Down

- 2) The testicle or testis is the male reproductive gland that produce both sperm and androgens (male hormones).
- 3) Zygote is the fertilized egg cell that results from the union of a female gamete (egg) with a male gamete (sperm).
- 4) Animals that produce young ones by means of eggs which hatch after they have been laid by the parent are called oviparous animals.
- 5) Binary fission is a type of reproduction in which a single organism gets divided into two. This type of reproduction takes place in Amoeba.

#464857

Topic: Female reproductive system

Which of the following is not a part of the female reproduction system in human beings?

- A** Ovary
- B** Uterus
- C** Vas deferens
- D** Fallopian tube

Solution

Female reproductive system consists of ovaries, fallopian tubes, uterus, vagina and external genitals. Ovaries are the paired structure and serve as primary female sex organs. Fallopian tubes are elongated tube like structures that connect the superior part of uterus, fundus, with ovaries. It is known as oviduct, these tubes propel the egg towards uterus and serve as site of fertilization. Uterus is thick walled muscular organ that projects into vagina through its cervix. It serves as site of embryo development. Vas deferens also known as sperm duct, connects epididymis to urethra and serves to carry sperms from testis to urethra.

#525967

Topic: Fertilization

Define external fertilization. Mention its disadvantages.

Solution

External fertilization is the process in which the fusion of male and female gamete takes place outside the female body in an external medium, generally water. For example, fish, frog, starfish etc. undergo external fertilization.

External fertilization has certain disadvantages. In external fertilization, eggs have fewer chances of fertilization. This can lead to the wastage of a large number of the eggs during this process. Further, there is an absence of proper parental care to the offspring, which results in a low rate of survival in the progress.

#525980

Topic: Gametogenesis

Differentiate gametogenesis from embryogenesis.

Solution

Gametogenesis is process of haploid gamete formation and occurs by meiosis in diploid gamete mother cells. It is followed by fertilization. Embryogenesis is the process of formation of diploid embryo by successive mitotic divisions in diploid zygote.

#525994

Topic: Fertilization

Why are offspring of oviparous animals at a greater risk as compared to offspring of viviparous animals?

Solution

Oviparous animals are egg-laying animals that bear young in the egg stage of development and young ones are developed outside the female body thereby not getting prenatal protection and nourishment. It poses a greater risk of predation and lower survival rate. Viviparous animals bear living young that develop within the body of the mother thereby getting proper prenatal care and protection leading to greater survival rate.

#526030

Topic: Fertilization

Fill in the blanks:

- (a) Humans reproduce (asexually/sexually).
- (b) Humans are (oviparous, viviparous, ovoviviparous).
- (c) Fertilisation is in humans (external/internal)
- (d) Male and female gametes are (diploid/haploid).
- (e) Zygote is (diploid/haploid).
- (f) The process of release of ovum from a mature follicle is known as
- (g) Ovulation is induced by a hormone called
- (h) The fusion of male and female gametes is called
- (i) Fertilisation takes place in
- (j) Zygote divides to form which is implanted in uterus.
- (k) The structure which provides the vascular connection between fetus and uterus is called

Solution

- a) Humans reproduce sexually.
- (b) Humans are viviparous.
- (c) Fertilisation is internal in humans.
- (d) Male and female gametes are haploid.
- (e) Zygote is diploid.
- (f) The process of release of ovum from a mature follicle is called ovulation.
- (g) Ovulation is induced by a hormone called Leutinizing hormone.
- (h) The fusion of male and female gametes is called fertilization.
- (i) Fertilisation takes place in oviduct.
- (j) Zygote divides to form blastula which is implanted in uterus.
- (k) The structure which provides vascular connection between fetus and uterus is called umbilical cord.

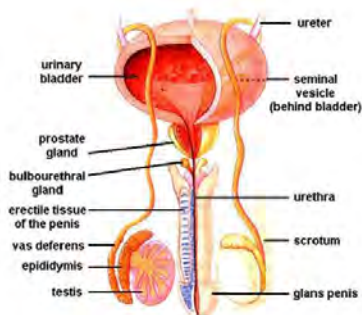
#526044

Topic: Male reproductive system

Draw a labelled diagram of male reproductive system.

Solution

The given diagram represents the male reproductive system that regulates the formation and transportation of male gametes.

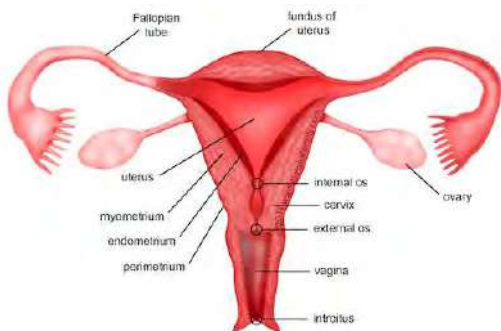


#526045

Topic: Female reproductive system

Draw a labelled diagram of female reproductive system.

Solution



#526046

Topic: Female reproductive system

Write two major functions each of testis and ovary.

Solution

Testes serve as the site of spermatogenesis for the production of sperm. The endocrine cells present in the space between seminiferous tubules are termed as interstitial cells. They serve to secrete androgen, testosterone, which is responsible for the development of male secondary sexual characters. Ovaries serve as the site of egg production by oogenesis and secrete female sex hormones namely estrogen and progesterone for development of female secondary sexual characteristics.

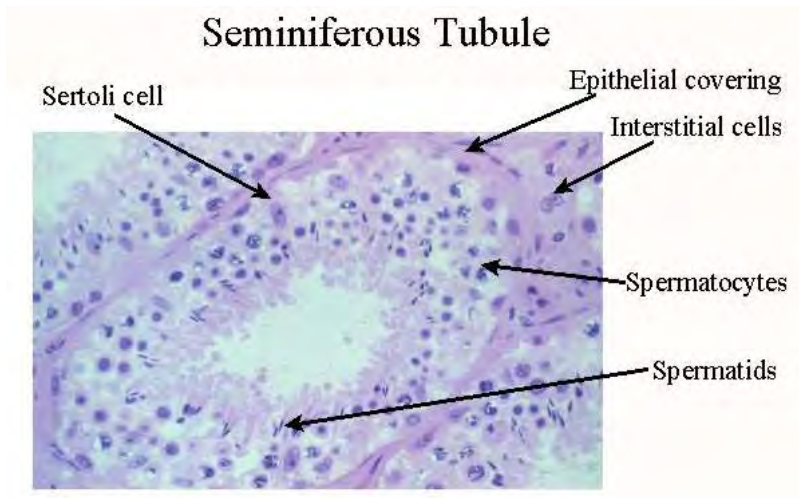
#526048

Topic: Male reproductive system

Describe the structure of a seminiferous tubule.

Solution

Each testicular lobule has tightly coiled seminiferous tubules which are packed with cells undergoing spermatogenesis (spermatogonia) and Sertoli cells. A germinal epithelium of delicate connective tissue surrounds the seminiferous tubules. The large sustentacular cells that extend from the capsule to the lumen of the seminiferous tubule are called Sertoli cells. They serve to support, nourish and regulate the development of cells undergoing spermatogenesis. The endocrine cells present in the space between seminiferous tubules are termed as interstitial cells of Leydig. They serve to secrete androgen, testosterone.



#526049

Topic: Gametogenesis

What is spermatogenesis? Briefly describe the process of spermatogenesis.

Solution

Spermatogenesis is the process of the production of sperms from the immature male germ cells. It starts at puberty and usually continues uninterrupted until death, although a slight decrease in the quantity of sperm is seen with increase in age.

Process of Spermatogenesis:

The spermatogonia (2N) present at the inner side of the seminiferous tubules multiply by mitotic divisions and increase in number. They stop undergoing mitosis, grow and become primary spermatocytes (2N). Each primary spermatocyte undergoes meiosis to form two equal haploid secondary spermatocytes (N). Each secondary spermatocyte then undergoes second meiotic division to form four equal haploid cells called spermatids (N). Spermatids receive nourishment to form sperms by the process called spermiogenesis.

#526050

Topic: Gametogenesis

Name the hormones involved in regulation of spermatogenesis.

Solution

Gonadotropins FSH and LH are secreted by the anterior pituitary. FSH promotes spermatogenesis in the seminiferous tubules and LH promotes androgen production in the interstitial cells (androgens are required for attainment of reproductive maturity in males).

#526052

Topic: Gametogenesis

Define spermiogenesis and spermiation.

Solution

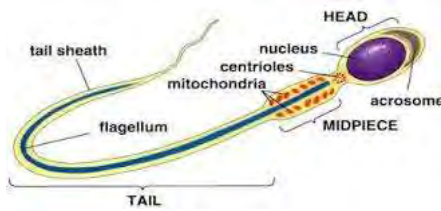
Transformation of spermatids into sperm by morphological changes without involving cell division is called as spermiogenesis. The release of mature spermatozoa from the Sertoli cells into the lumen of seminiferous tubules is called as spermiation.

#526054

Topic: Gametogenesis

Draw a labelled diagram of sperm.

Solution



#526056

Topic: Male reproductive system

What are the major components of seminal plasma?

Solution

Semen is a mixture of sperms and seminal plasma. Seminal vesicle secretion accounts for 60% of seminal plasma and adds alkaline pH (to counteract acidic pH of the vagina), fructose (a nutrient), mucus and coagulating and local acting enzymes. Prostate gland secretions account for 30% of plasma and add citrate (a nutrient for sperm mitochondria), calcium and a proteolytic enzyme termed as prostate specific antigen (to liquefy ejaculate just before release). Secretion from Cowper gland adds only small volume.

#526060

Topic: Male reproductive system

What are the major functions of male accessory ducts and glands?

Solution

The male accessory ducts (vasa efferentia, epididymis, vas deferens, and rete testis) serve to store spermatozoa and to transport them outside urethra during ejaculation. Male accessory glands are seminal vesicles, prostate glands, and bulbourethral glands which contribute seminal plasma to semen. Seminal vesicle secretion accounts for 60% of seminal plasma and adds alkaline pH (to counteract acidic pH of the vagina), fructose (a nutrient), mucus and coagulating and local acting enzymes. Prostate gland secretions account for 30% of plasma and add citrate (a nutrient for sperm mitochondria), calcium and a proteolytic enzyme termed as prostate-specific antigen (to liquefy ejaculate just before release). Secretion from Cowper gland adds only small volume.

#526061

Topic: Gametogenesis

What is oogenesis? Give a brief account of oogenesis.

Solution

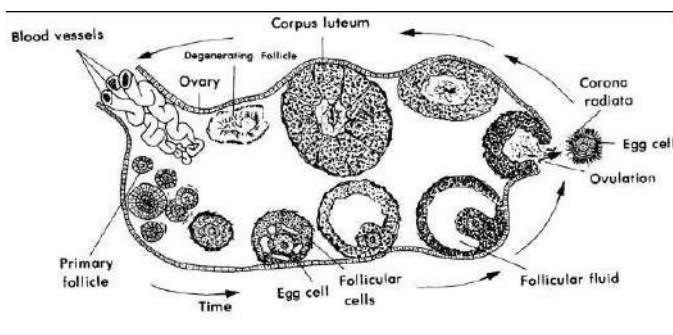
Oogenesis is the production of egg cells inside the ovaries. During foetal development, few germinal cells in human ovary differentiate and divide mitotically to produce egg mother cell/oogonia. Further, oogonia become larger and divide to produce diploid primary oocyte. In follicular prenatal phase, the primary oocytes start first meiotic division but are transitionally suspended into prophase stage of meiosis I and are stored in the follicle. After puberty, primary oocyte resumes the division and completion of first meiotic division produce one secondary oocyte (egg cell) and one polar body (non-functional cell).

#526062

Topic: Female reproductive system

Draw a labelled diagram of a section through ovary.

Solution



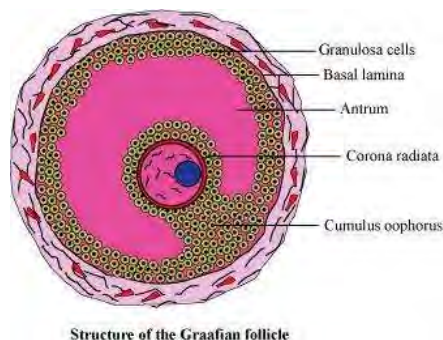
#526063

Topic: Menstrual cycle

Draw a labelled diagram of a Graafian follicle.

Solution

Graafian follicle is a fluid-filled structure in the mammalian ovary which carries ovum development.



#526065

Topic: Gametogenesis

Give the functions of the following:

- (a) Corpus luteum (b) Endometrium
- (c) Acrosome (d) Sperm tail
- (e) Fimbriae

Solution

- (a) Corpus luteum – Corpus luteum is formed from the ruptured Graafian follicle. It secretes progesterone hormone during the luteal phase of the menstrual cycle. A high level of progesterone inhibits the secretions of FSH and LH, thereby preventing ovulation. It also allows the endometrium of the uterus to proliferate and to prepare itself for implantation.
- (b) Endometrium – It is the innermost lining of the uterus. It is rich in glands and undergoes cyclic changes during various phases of the menstrual cycle to prepare itself for the implantation of the embryo.
- (c) Acrosome – It is a cap-like structure present in the anterior part of the head of the sperm. It contains hyaluronidase enzyme, which hydrolyzes the outer membrane of the egg thereby helping the sperm to penetrate the egg at the time of fertilization.
- (d) Sperm tail – It is the longest region of the sperm that facilitates the movement of the sperm inside the female reproductive tract.
- (e) Fimbriae – They are finger-like projections at the ovarian end of the fallopian tube. They help in the collection of the ovum (after ovulation), which is facilitated by the beating of the cilia.

#526068

Topic: Menstrual cycle

Identify True/False statements. Correct each false statement to make it true.

- (a) Androgens are produced by Sertoli cells. (True/False)
- (b) Spermatozoa get nutrition from Sertoli cells. (True/False)
- (c) Leydig cells are found in ovary. (True/False)
- (d) Leydig cells synthesise androgens. (True/False)
- (e) Oogenesis takes place in corpus luteum. (True/False)
- (f) Menstrual cycle ceases during pregnancy. (True/False)
- (g) Presence or absence of hymen is not a reliable indicator of virginity or sexual experience. (True/False)

Solution

- (a) Androgens are produced by Sertoli cells. (False) Androgens are produced by Leydig cells.
- (b) Spermatozoa get nutrition from Sertoli cells. (True)
- (c) Leydig cells are found in ovary. (False) Leydig cells are found in the seminiferous tubules of the testis.
- (d) Leydig cells synthesise androgens. (True)
- (e) Oogenesis takes place in corpus luteum. (False) Oogenesis takes place in the ovary.
- (f) Menstrual cycle ceases during pregnancy. (True)
- (g) Presence or absence of the hymen is not a reliable indicator of virginity or sexual experience. (True)

#526070

Topic: Menstrual cycle

What is menstrual cycle? Which hormones regulate menstrual cycle?

Solution

The menstrual cycle is the female reproductive cycle characterized by cyclic changes in the uterine lining. Menstrual cycle is regulated by gonadotropins secreted by anterior pituitary (FSH and LH). FSH stimulates growth, development and hormonal secretion of Graafian follicle and ovum maturation. LH stimulates maturation of Graafian follicle and LH surge between 12 to 14 days of cycle stimulates rupture of Graafian follicle and release of ovum i.e. ovulation. Gonadotropins also stimulate developing follicles to secrete progesterone and estrogen which in turn prepare the uterus for implantation and exert negative feedback regulation on the secretion of gonadotropins after ovulation.

#526071

Topic: Gestation period, parturition and lactation

What is parturition? Which hormones are involved in induction of parturition?

Solution

Parturition is the act of giving birth to the young; childbirth. Fully developed foetus and placenta send signals for parturition which in turn induces mild uterine contractions by stretching of cervix referred to as foetal ejection reflex. Stretching of cervix exerts positive feedback on the posterior pituitary to secrete oxytocin. Oxytocin exhibits both direct and indirect (via prostaglandins) effect on the uterus to facilitate uterine contractions to push the foetus downward which in turn stretches cervix more and leads to childbirth. Relaxin is secreted by corpus luteum at the end of pregnancy. It serves to relax the pelvic ligament and cervix to facilitate the birth of young one.

#526076

Topic: Gametogenesis

How many eggs are released by a human ovary in a month? How many eggs do you think would have been released if the mother gave birth to identical twins? Would your answer change if the twins born were fraternal?

Solution

One egg is released per month from the ovary. The term "monozygous" represent being developed from a single zygote. The first division in zygote produce two identical cells that independently develop into two embryos; monozygotic/identical twins are produced. The term "multizygous/fraternal" represent being developed from individual zygotes. Fertilization of two eggs by two sperms produces two zygotes that independently develop into fraternal embryos. So, identical twins are born from a single egg while two or more eggs are fertilized in case of fraternal twins.