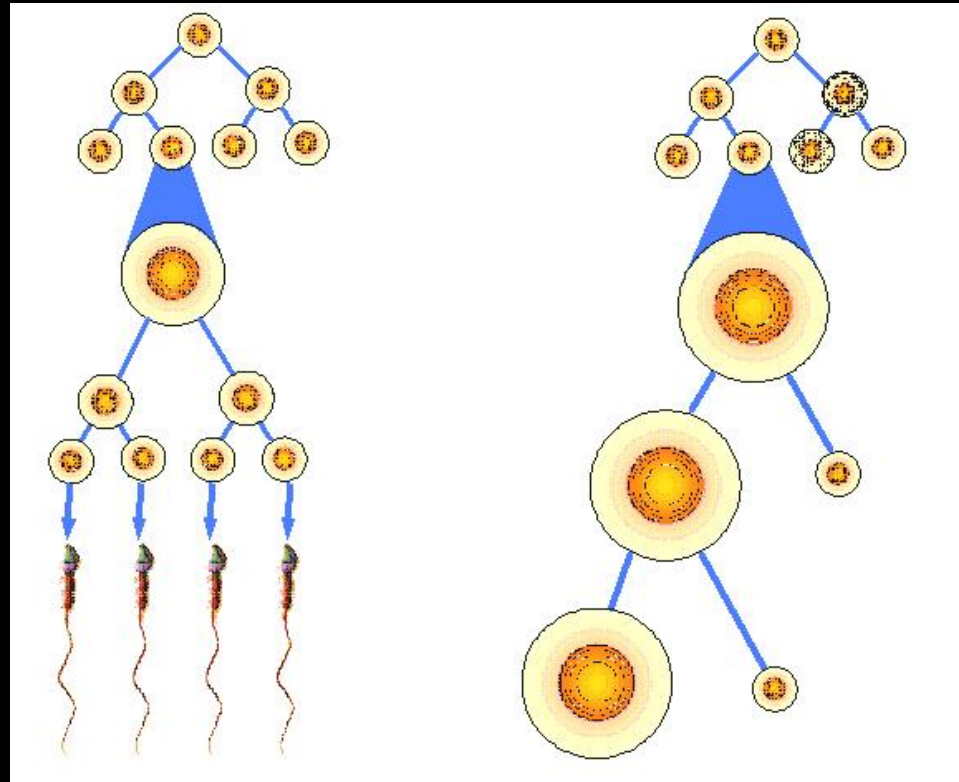
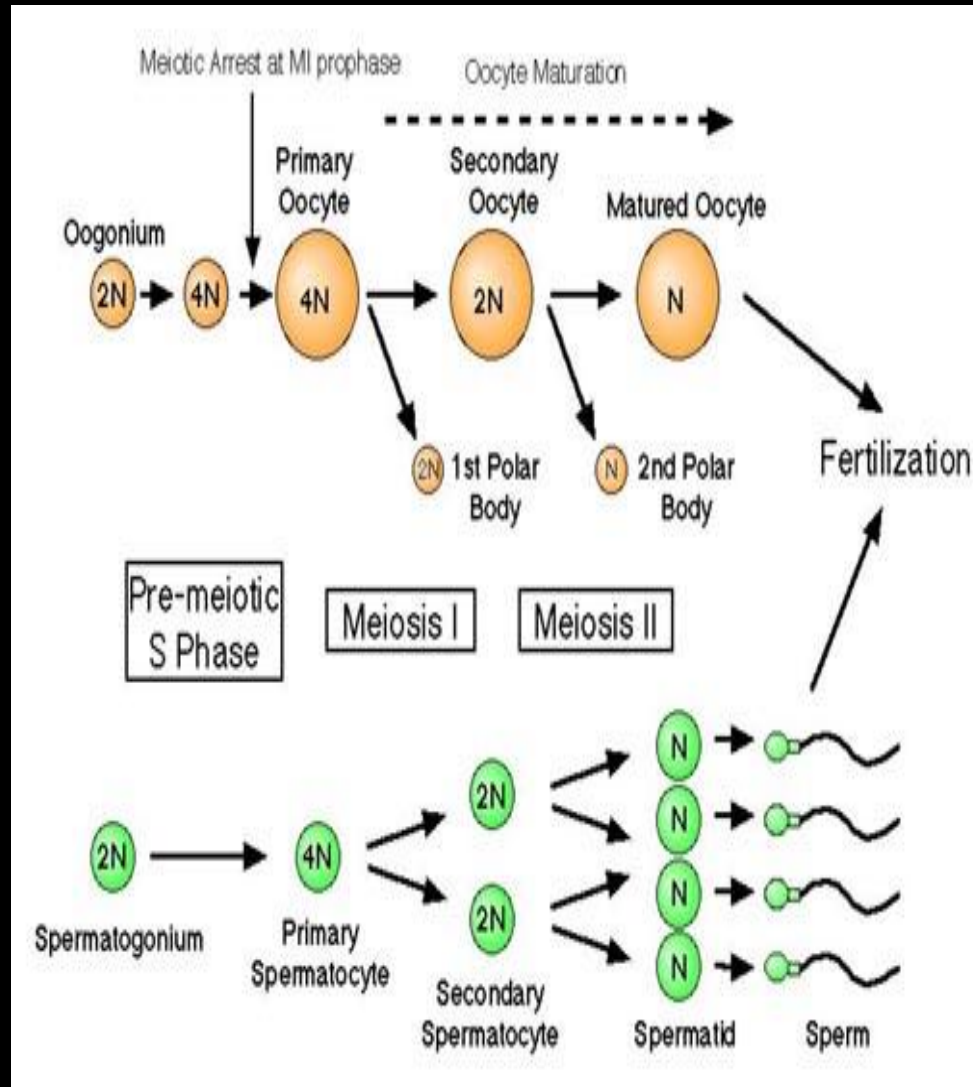


# Gametogenesis



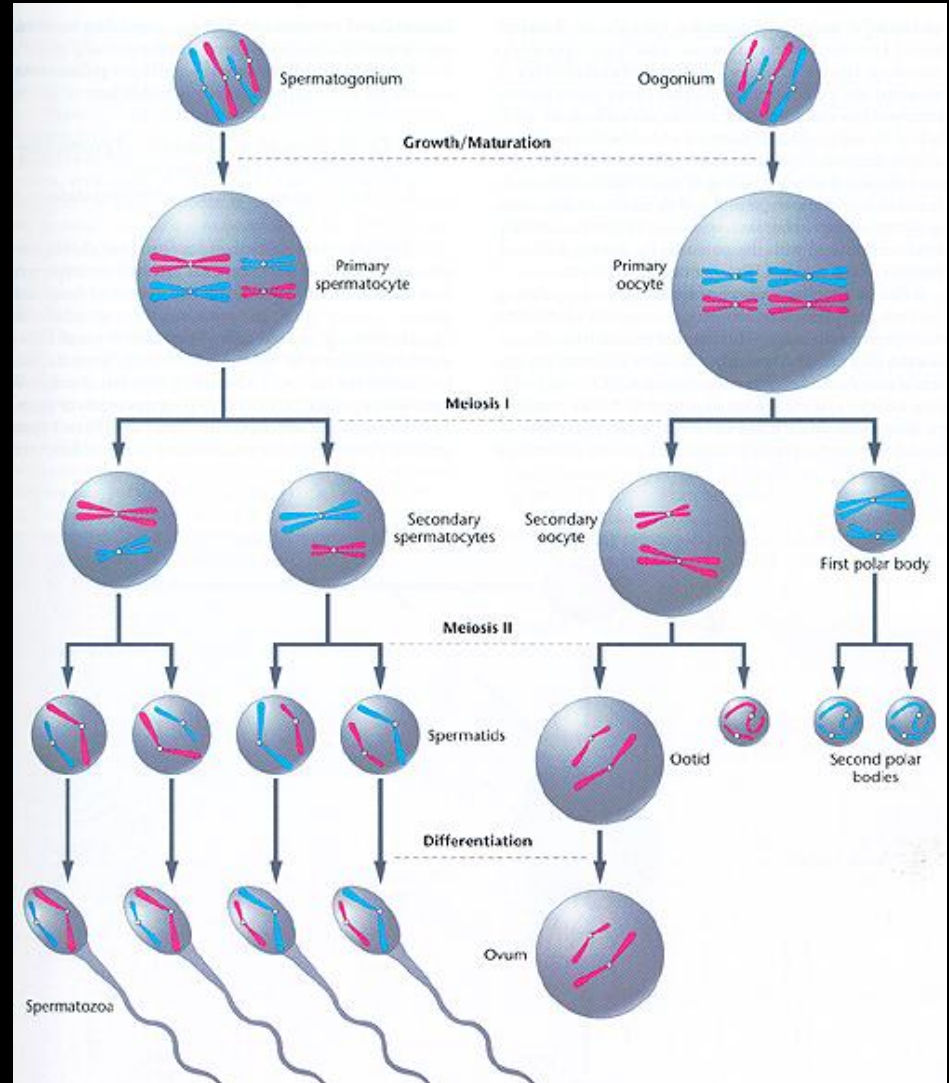
**Dr. Archana Rani**  
**Associate Professor**  
**Department of Anatomy**  
**KGMU UP, Lucknow**

# Gametogenesis



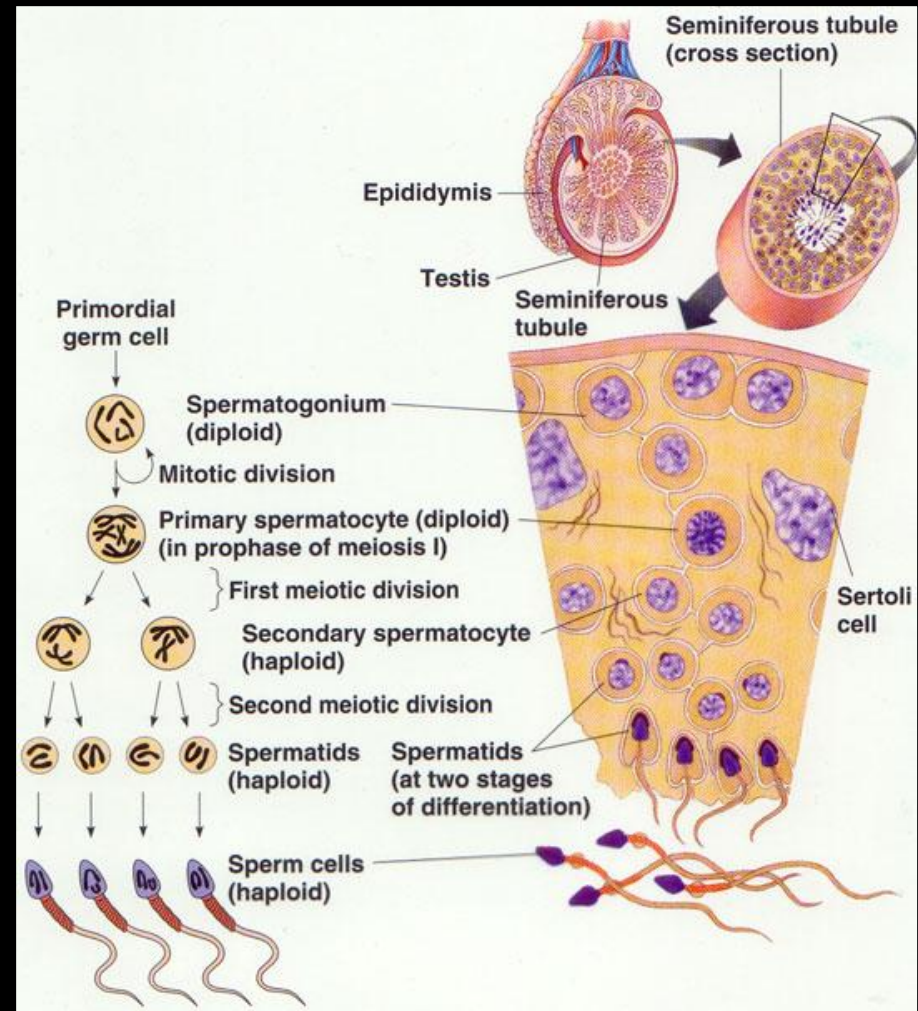
# Gametogenesis

- **Gametogenesis:** formation of gametes.
- Gametes develop in the gonads (sex cells).
- In males, it is **spermatogenesis**, formation of sperm.
- In females, it is **oogenesis**, formation of ova.



# Spermatogenesis

- Process by which spermatogonia differentiate into mature spermatozoa.
- Begins at puberty.
- Spermatozoa are formed in the wall of seminiferous tubules of the testes.



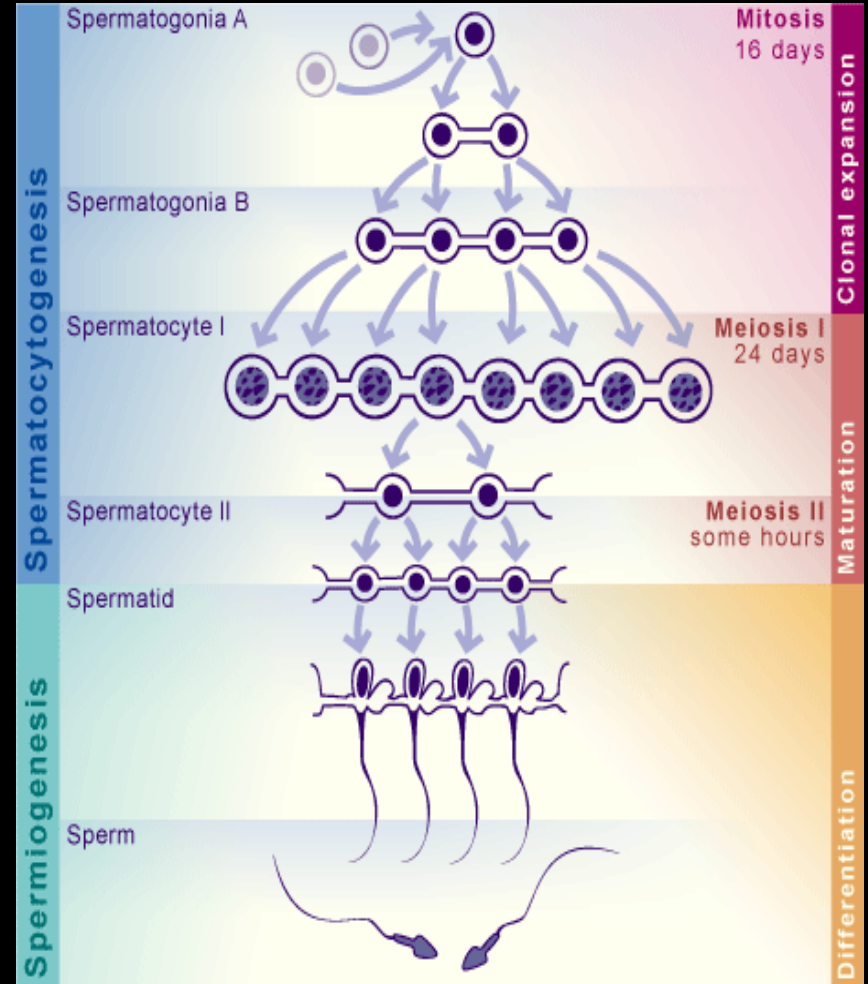
# Stages in Spermatogenesis

- Many cells of different sizes and shapes:

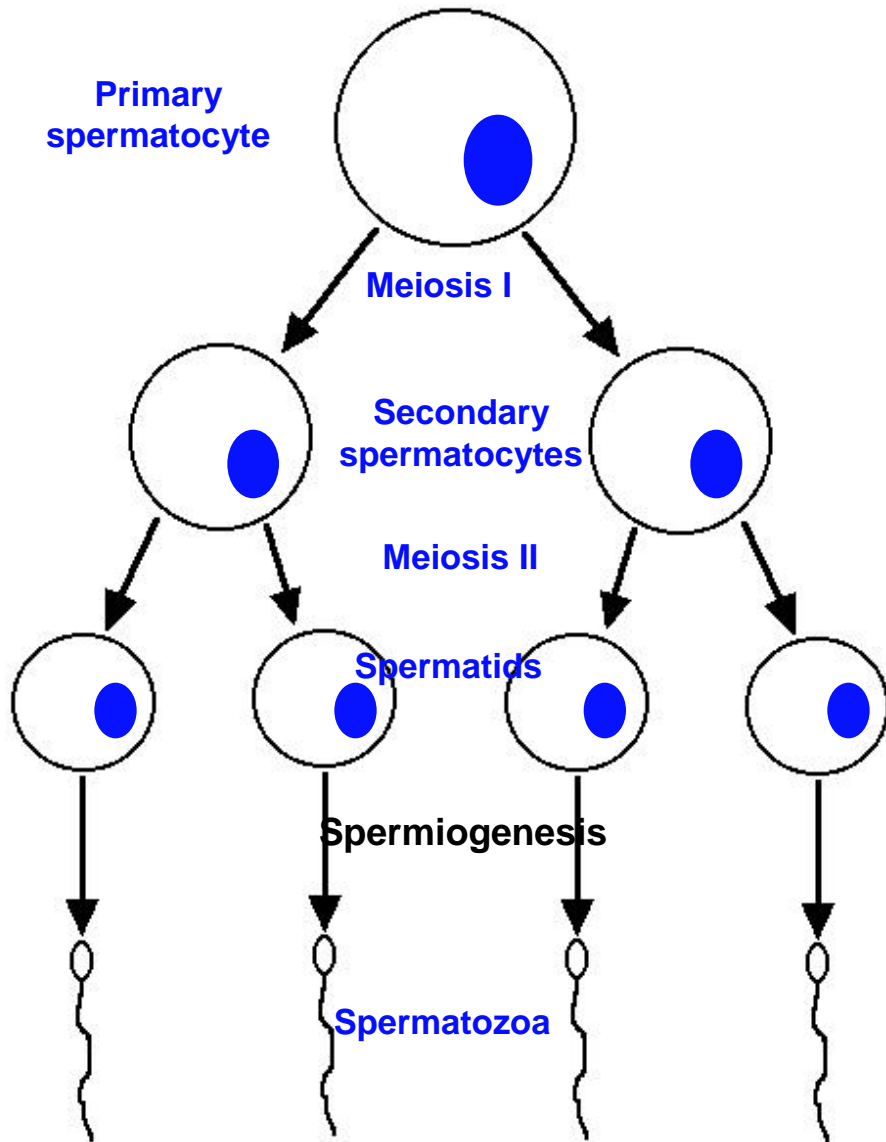
(a) Various cell stages in spermatogenesis

(b) Sertoli (sustentacular) cells

- Sertoli cells provide support and nutrition to germ cells.
- Regulated by luteinising hormone (LH).
- It binds to Leydig cells to stimulate testosterone production.



## SPERMATOGENESIS

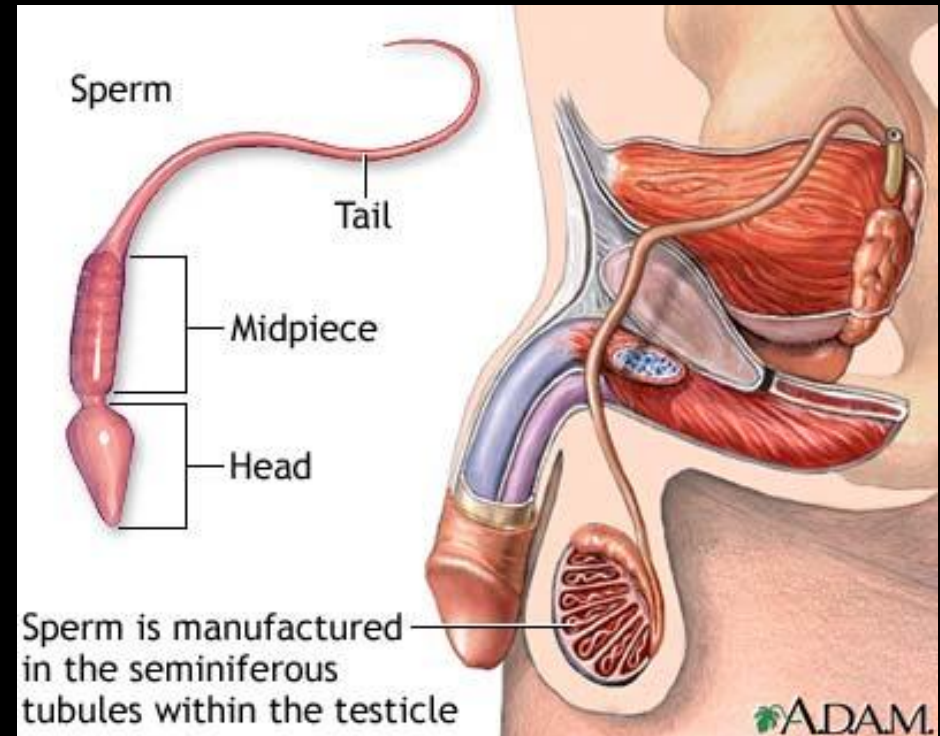


# Spermiogenesis

- The process of transformation of a circular spermatid to a spermatozoon is called spermiogenesis.
- Golgi phase
- Cap phase
- Acrosomal phase
- Maturation phase

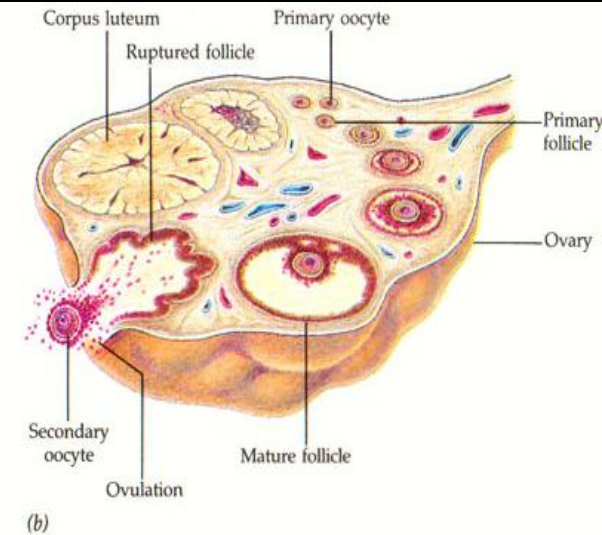
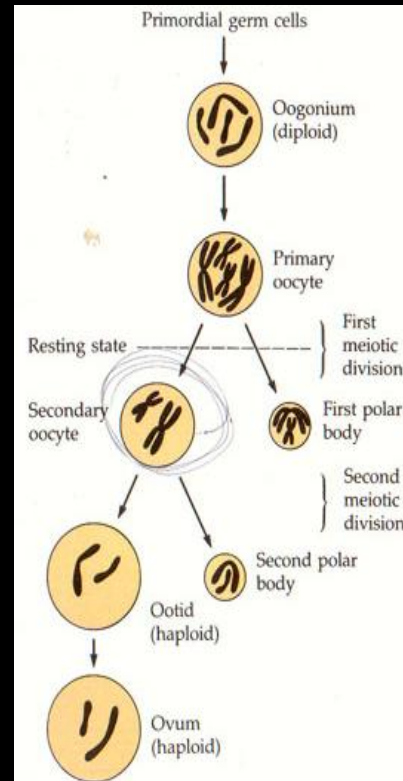
# Spermatozoon

- An actively motile, free swimming cell.
- Consists of a head, neck and a tail (flagellum).
- Head: ovoid, consists of nucleus. The anterior  $\frac{2}{3}$ <sup>rd</sup> of nucleus is covered by acrosomal cap.
- Tail has 3 segments: middle piece, principal piece and end piece.



# Oogenesis

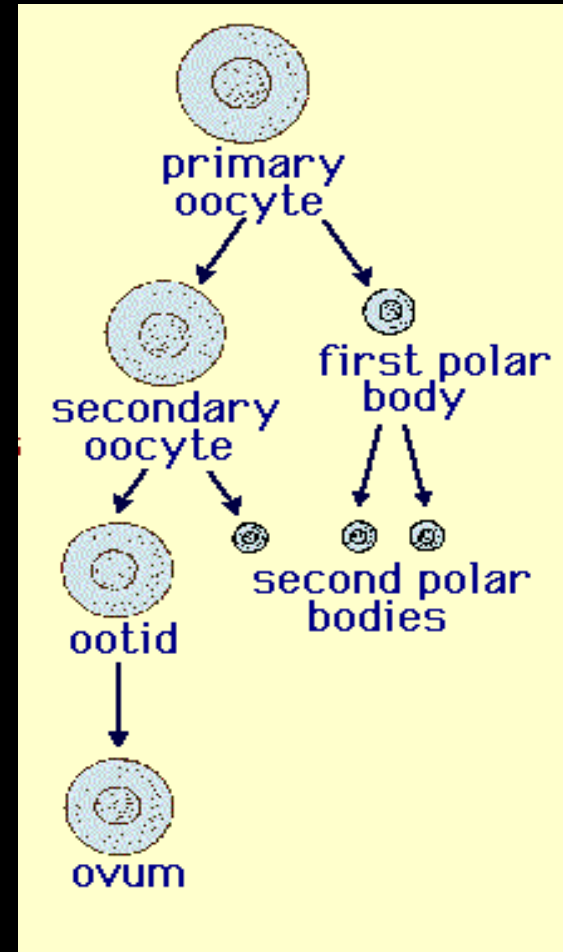
- Occurs in the ovaries and in the oviducts.
- Starts before birth.
- Ovary has cortex & medulla.
- Oogonia are present in cortex.
- Oogonia are produced at a very early stage (before birth) and do not multiply thereafter.



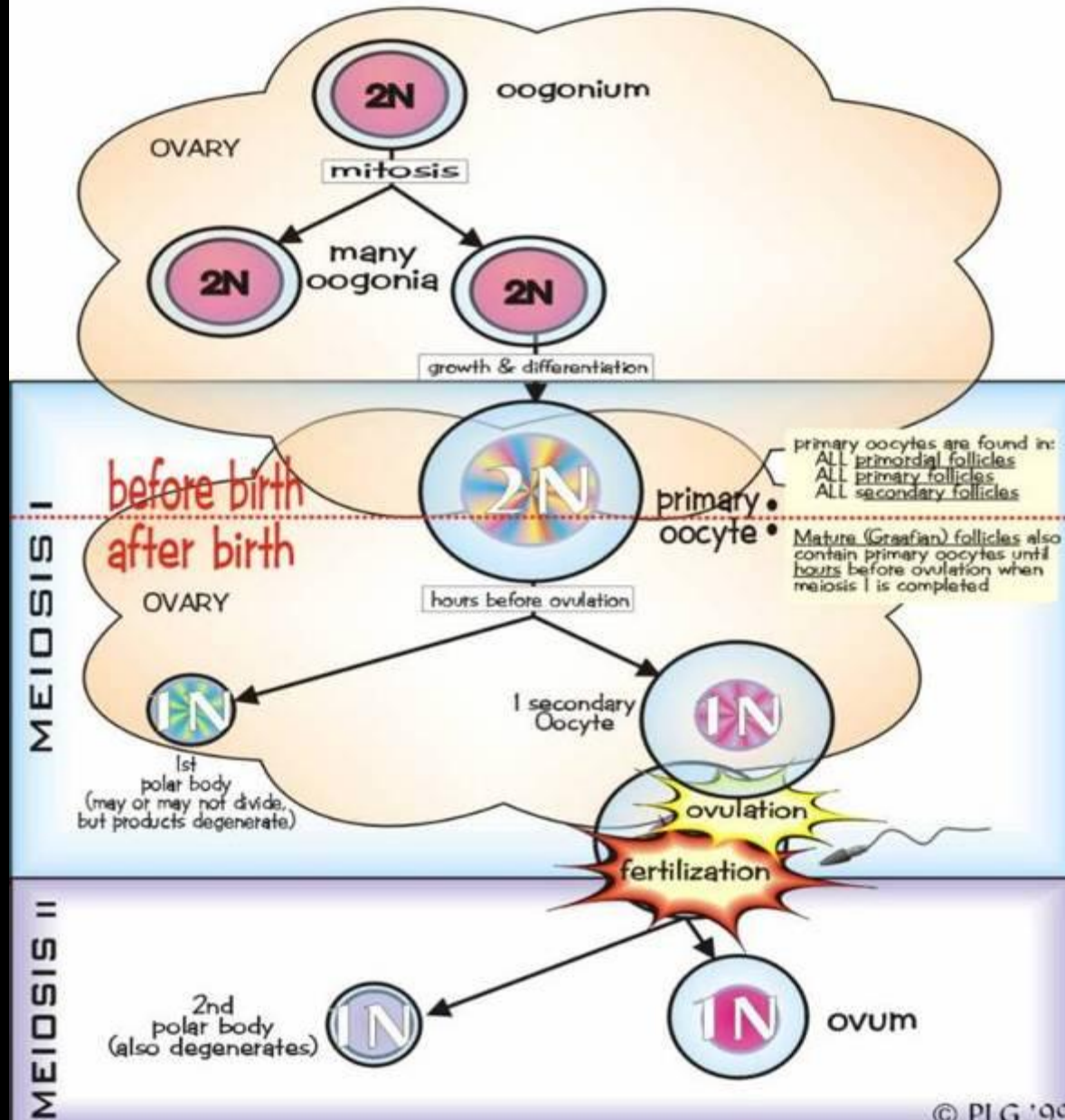


# Oogenesis

- After Telophase I and II, the cytoplasm is not equally divided.
- One of the new cells gets the majority and it survives, while the other one, a **polar body**, gets broken down.

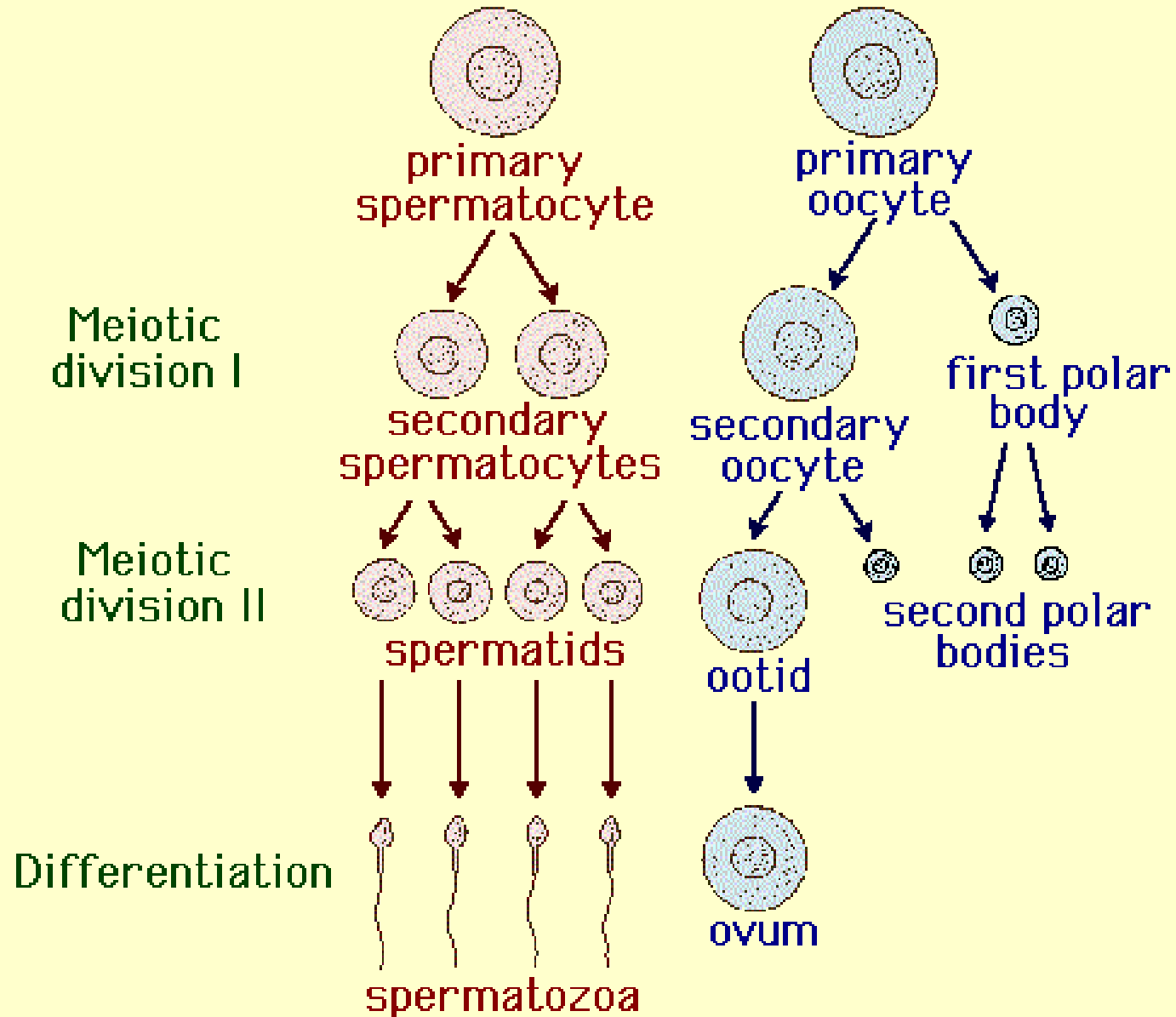


# OOGENESIS

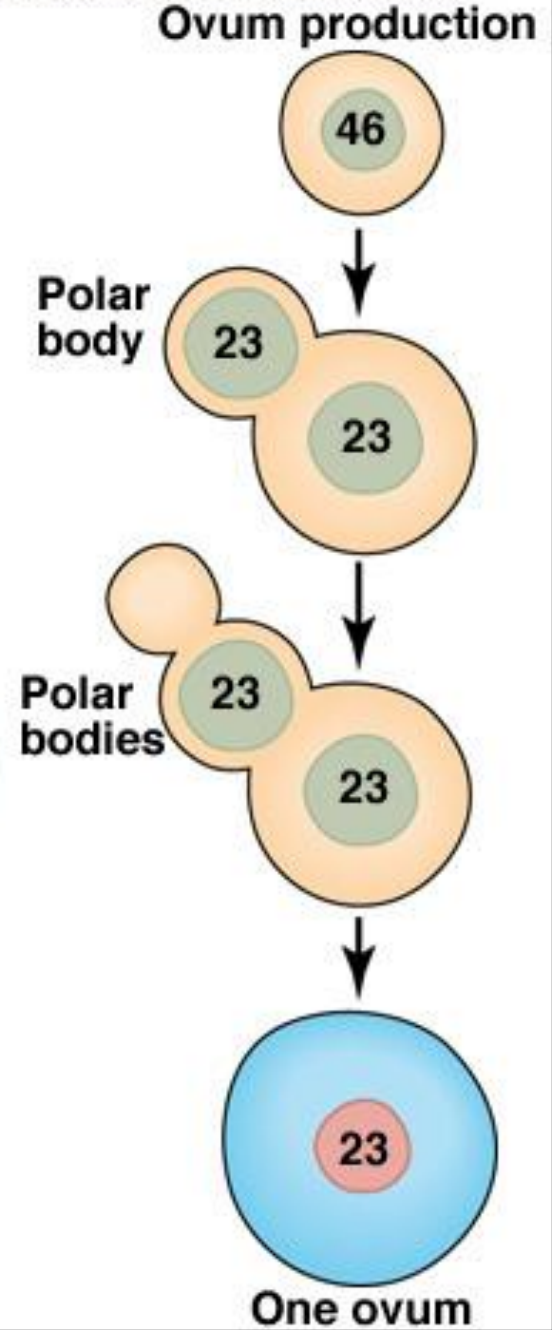
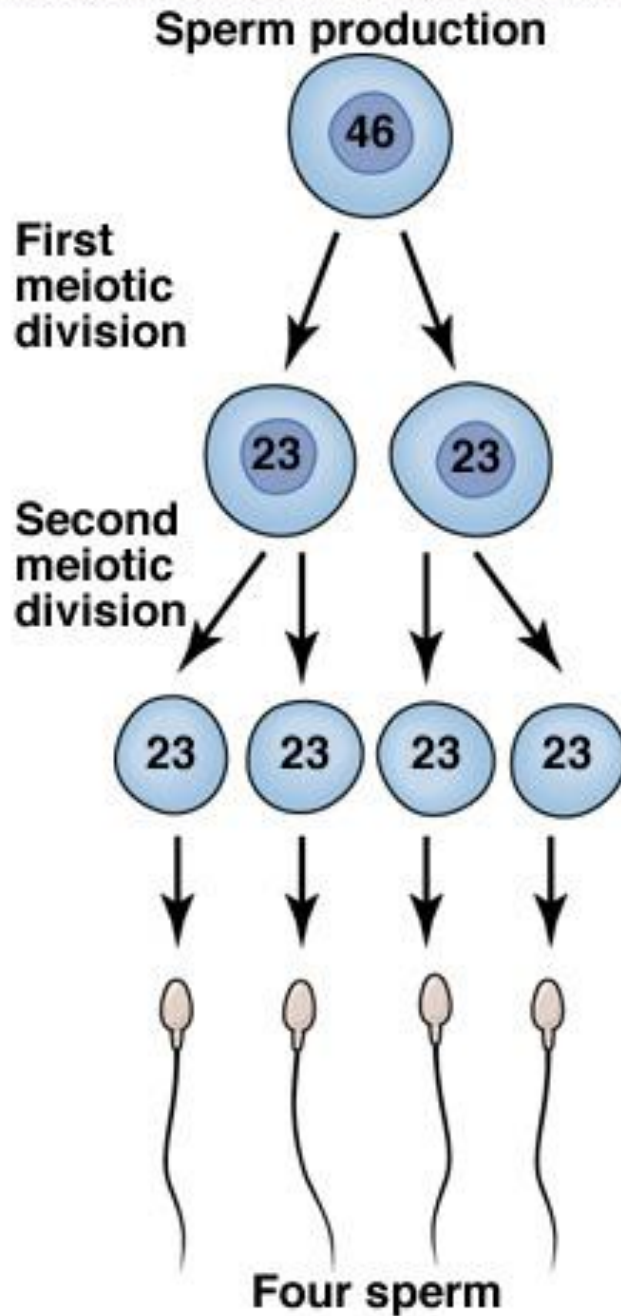


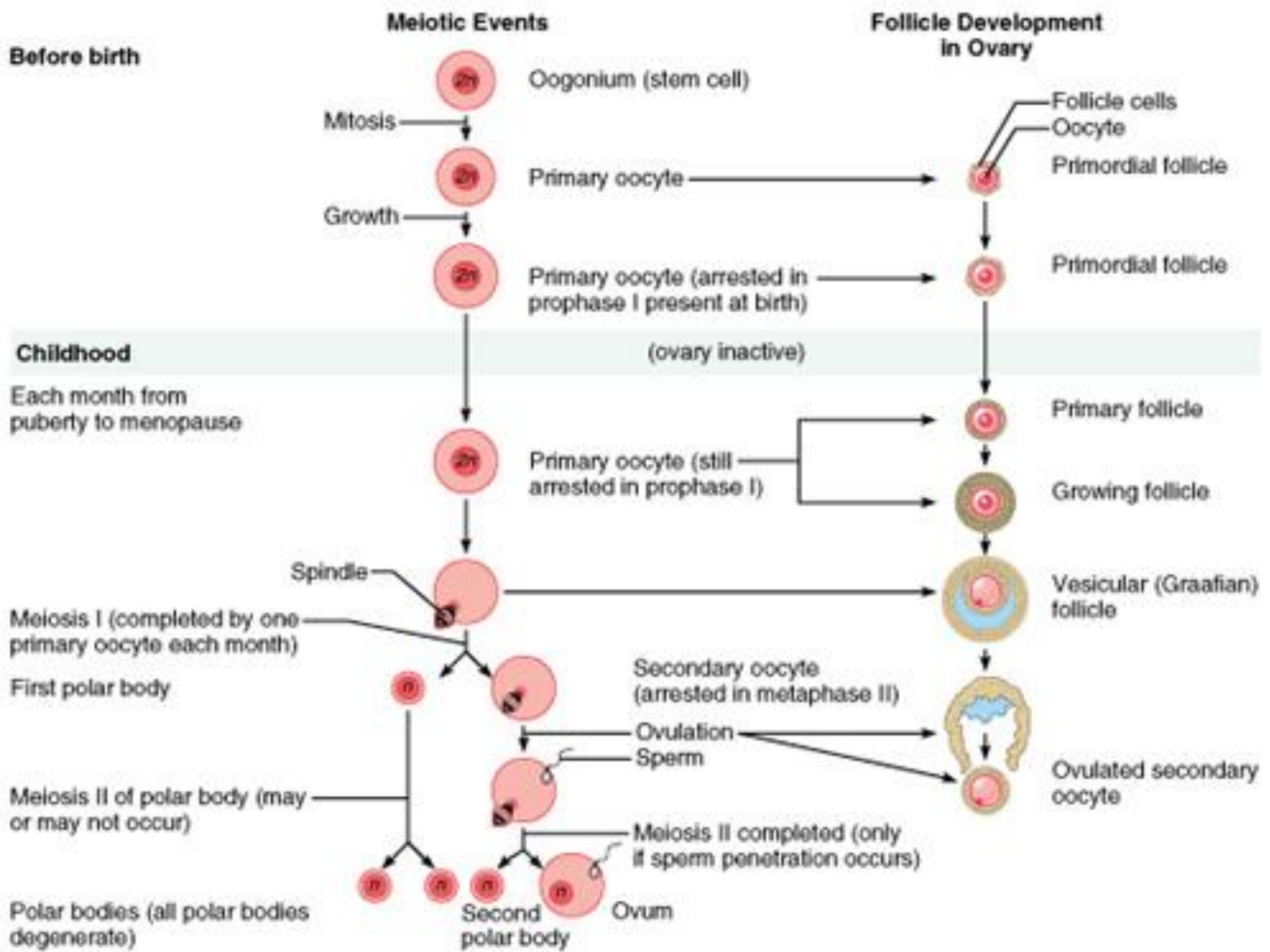
# SPERMATOGENESIS

# OOGENESIS



# Ovum and Sperm Production





# IMPORTANT TERMS

**Gamete:** egg or sperm

**Gametogenesis:** process of formation and development of gametes

**Oogenesis:** production of eggs

**Spermatogenesis:** production of sperms

**Spermiogenesis:** differentiation of sperm morphology

**Follicle:** where eggs mature in the ovary

**Ovulation:** release of egg from follicle

**Polar body:** nonfunctional product of meiotic divisions in oogenesis

**Zygote:** Fertilized egg

# REFERENCES

1. Essentials of Anatomy for Dentistry Students, 1<sup>st</sup> Edition.
2. Langman's Medical Embryology, 11<sup>th</sup> Edition.
3. Human Embryology, 5<sup>th</sup> Edition.

# MCQ

- The supporting cells derived from the surface epithelium of testis is-
1. Spermatogonia
  2. Spermatocytes
  3. Sertoli cells
  4. Leydig cells



# MCQ

- Spermatogenesis starts-
  1. Before birth
  2. After birth
  3. At puberty
  4. After puberty

# MCQ

- Oogenesis starts-
  1. Before birth
  2. After birth
  3. At puberty
  4. After puberty

# MCQ

- Oogonia undergo mitosis to form-
  1. Primary oocyte
  2. Secondary oocyte
  3. First polar body
  4. Second polar body

# MCQ

- The process of spermatogenesis is regulated by-

1. Testosterone
2. Luteinising hormone
3. Follicle-stimulating hormone
4. Testicular fluid