Difference Between Leydig Cells and Sertoli Cells

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Key Difference - Leydig Cells vs Sertoli Cells

In the context of male gametogenesis, Leydig cells and Sertoli cells play an important role. They assist the functioning of the male reproductive system and thereby helps the formation of male gametes, sperms by the process spermatogenesis. Leydig cells are present between the seminiferous tubules whilst the Sertoli cells are present between the germinal epithelium of the seminiferous tubules. **The Leydig cells are round in shape and present as small groups within a shorter distance to each other in contrast, Sertoli cells are tall and elongated and present as single cells which are tightly packed.** This is the **key difference** between Leydig cells and Sertoli cells.

What are Leydig Cells?

Leydig cells can be found next to the seminiferous tubules in testicles. They can be also called as interstitial cells of Leydig. The function of these cells is to produce the hormone testosterone with the aid of luteinizing hormone. They take the shape of a polyhedral and a large nucleus is present eccentrically. About one to three nucleoli and numerous heterochromatin which are stained in a darker color are present in the nucleus.

The cytoplasm of the Leydig cells consists of many smooth endoplasmic reticula, membrane-bound lipid droplets, and a few mitochondria. In addition to these, a pigment called lipofuscin, and crystal-like structures called as Reinke crystals are also present in these cells. Mature Leydig cells are differentiated in testis during the postpartum period and remain inactive until puberty. In fetal Leydig cells, a sufficient amount of testosterone is produced in a male fetus between gestation periods of eighth to the twentieth week. A class of hormones called as androgens are released by Leydig cells. With the stimulation of a pituitary hormone luteinizing hormone, these androgens secrete few hormones such as testosterone, dehydroepiandrosterone (DHEA) and androstenedione. Here, the testosterone is synthesized and released from the Leydig cells because the cholesterol demolishes activity is increased by the Luteinizing hormone.

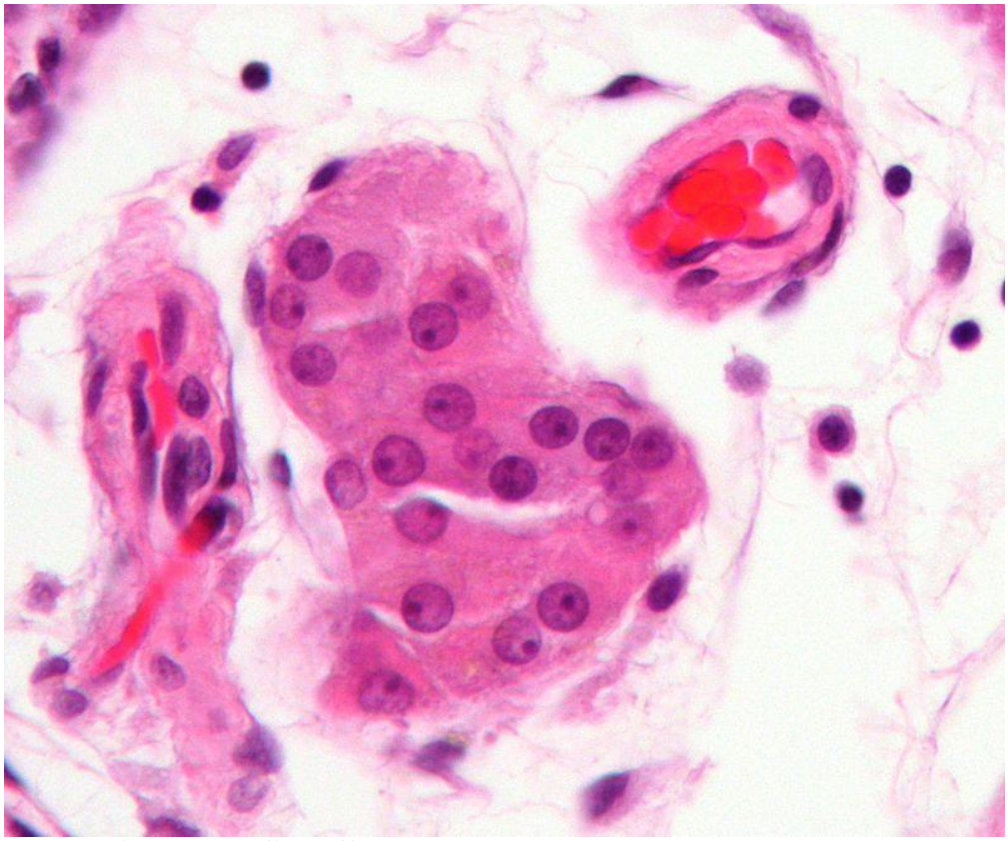

Fig 01: Leydig cells

There are few diseases which are caused in Leydig cells. Leydig cell tumors and adrenomyeloneuropathy are few examples. Leydig cell tumors are formed because Leydig cells are grown abnormally and uncontrollably. These are active hormonally thus, produce excess testosterone. Adrenomyeloneuropathy is a disease caused affecting the Leydig cells. Here, the level of testosterone is reduced lower than the normal level due to higher levels of Luteinizing hormone and Follicle stimulating hormone. Also, in addition, the destruction of Leydig cells is also caused due to lateral electrical surface stimulation therapy.

What are Sertoli Cells?

Spermatogenesis is a process by which sperms; male gametes are produced in the testis. It takes place in the seminiferous tubules of the testis. The seminiferous tubules are complex structures that are lined by a stratified epithelium with the presence of two different types of cells; spermatogenic cells and Sertoli cells. Spermatogenic cells give rise to spermatozoa through different development stages whilst Sertoli cells involve in providing nutrients and support to the seminiferous tubules.

Sertoli cells are derived from the epithelial cords of the developing gonads. They are avascular cells. These cells are tall and columnar in structure and are present in from the basement membrane up to the lumen. They involve in forming pockets around differentiating and proliferating germ cells. Sertoli cells provide nutrients t these cells and involve in a phagocytic action in order to remove excess cytoplasm of the spermatids which is not necessary for developing spermatozoa. Tight junctions

connect Sertoli cells together which seal the tubule into two compartments; the basal compartment, which is close to the basal lamina and adluminal compartment, which is closer towards the lumen. This creates the blood-testis barrier which prevents the passing of larger molecules between the two compartments.

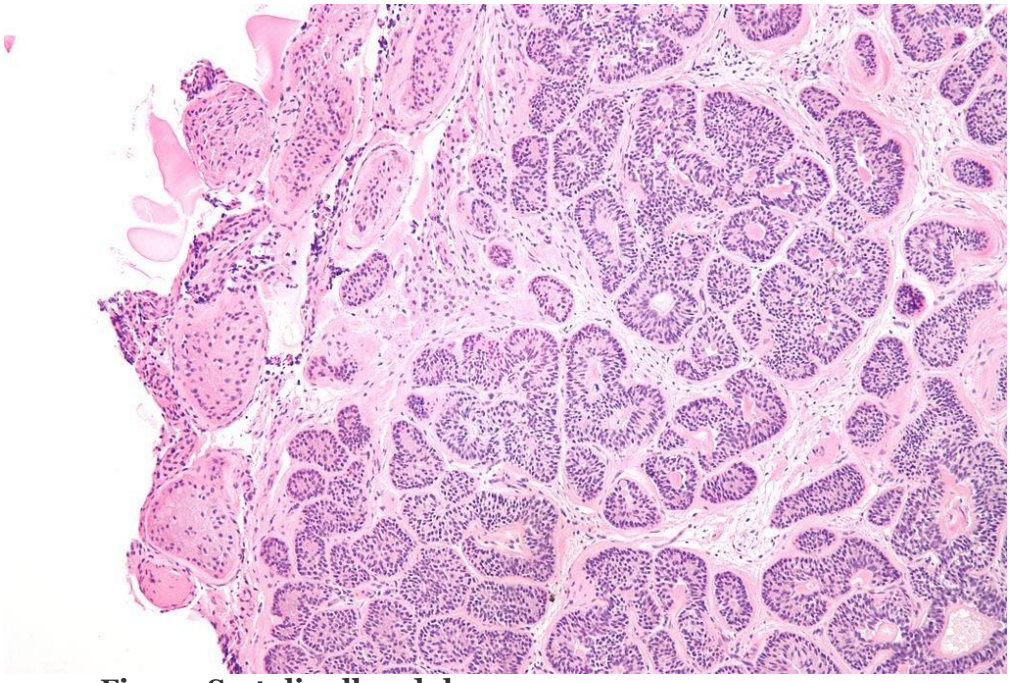

Fig 02: Sertoli cell nodule

This barrier created by the Sertoli cells involves in differentiating different cell stages of spermatogenesis from blood which includes developing spermatogonia, spermatocytes, spermatids and mature sperms. Sertoli cells involve in the production of testicular fluids. This is essential in the development process of spermatozoa since the fluid consist of protein; ABP (androgen binding protein) which binds and concentrates testosterone. It also has the function of secreting a hormone, inhibin which inhibits the release of FSH and controls the rate of spermatogenesis.

What are the Similarities Between Leydig Cells and Sertoli Cells?

- Both types of cells assist in the functioning of seminiferous tubules and the spermatogenesis process.

What is the Difference Between Leydig Cells and Sertoli Cells?

Leydig Cells vs Sertoli Cells	
Leydig cells are the cellswhich produce testosterone in the presence of luteinizing hormone (LH)	Sertoli cells are the somatic cells of the testis that are essential for testis formation and spermatogenesis
Location	

Present between the seminiferous tubules.	Present between the germinal epithelium of the seminiferous tubules.
Types of cells	
The cells are round in shape and found in small groups.	Cells are tall and elongated and occur as single cells tightly packed.
Function	
Involve in producing androgens; testosterone.	Provide support and nutrients to the seminiferous tubules and produce testicular fluids with ABP.

Summary - Leydig Cells vs Sertoli Cells

Leydig cells and Sertoli cells are two important cell components present in the seminiferous tubules of the testis of male reproductive system. Both cells actively involved in the process of spermatogenesis. Leydig cells are present between the seminiferous tubules. The function of these cells is to produce the hormone testosterone with the aid of luteinizing hormone. They are round in shape and occur as groups. Leydig cell tumors are formed because Leydig cells are grown abnormally and uncontrollably. Sertoli cells are tall, elongated cells that occur as single cells and involve in supporting and providing adequate nutrients to the seminiferous tubules for its proper functioning. They are found in-between the germinal epithelium of the seminiferous tubules. This can be elaborated as the difference between Leydig cells and Sertoli cells.

Reference:

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2.'Sertoli cell nodule intermed mag'By Nephron - Own work, (CC BY-SA 3.0) via Commons Wikimedia

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