Introduction to Histology: Reproductive System

Pre-laboratory Questions

1. What is specific about gametes when compared to other cells of the body?
   Gametes are haploid cells and they go through a process of genetic reduction called meiosis. Gametes also carry all the genetic information onto the next generation, and they also have the ability to give rise to an entirely new organism.

2. Name the three layers of the uterus and what are the main tissue types present?
   The uterus contains three different layers, and the first layer is called the endometrium. The endometrium is the inner layer that contains columnar epithelium. The second layer is the myometrium, and it is the middle and thickest layer of the uterus wall. This layer is mostly made of smooth muscle. The third and last layer is the perimetrium. This is the outer serous layer of the uterus. This layer consists of connective tissue covered by simple squamous mesothelium.

3. What are the three main areas of the uterus and where are they located?
   There are 3 parts of the uterus. The first part is called the fundus. The fundus is located at the top of the uterus. The second part is the body. This is the middle and main part of the uterus, and it also contains the uterine cavity. The third part is called the cervix. It is located in the lower, narrow part of the uterus.

4. Where are the spermatozoa produced in the scrotum? Where are they stored?
   The spermatozoa are produced in the testes in the scrotum. They are then transported to the epididymis where they mature and are stored.

5. Name the stages of egg maturation and how can we distinguish them?
   The eggs go through a maturation process called oogenesis. The first stage of oogenesis is called the primordial germ call. This is the "seed" cell of every oocyte is the primordial germ cell. These will either become a sperm cell or an oocyte cell and then move to the corresponding area, the testes or the ovaries. The next stage is the oogonium, and this is when the primordial germ cell arrives into the gonads and is influenced by the surrounding cells to become the oogonium. These cells are diploid cells so that means that they have two sets of chromosomes. These cells will also go through mitotic cell division in the first five months. The germ cells will then go through a cloning process called meiosis during this time. The next stage is called the primary oocyte. This is when the cell goes through meiosis and becomes a mature ovum. They will finish dividing and focus on growing at this point. Secondary oocyte is the next stage that jump-starts puberty. This will start once meiotic cell division splits

the cells into a small polar body and a large secondary oocyte. It will then finish the first part of the meiotic cell division and then lead to the next step called the ootid. The ootid is the second phase of the meiotic cell division. the secondary oocyte will then split again into another small polar body cell and a larger mature cell. The larger mature cell is called the ootid. This will then trigger ovulation to occur. The ovum is the next stage of this process. During ovulation the ootid is released from the follicle. The oocyte will be drawn into the fallopian tube, and it will continue to move along the tube. Fertilization can occur at this stage and when that occurs, the ootid will go through its final stage of maturation to become an ovum. During the fertilization process, the ovum and sperm cell combine and now they will have 46 chromosomes. The chromosomes will fuse together and create a new cell with a full set of chromosomes. This process creates a new cell called the zygote. They zygote will then develop to become an embryo and about nine months later, a newborn baby.

6. What is the name of the cells which make female sex hormones in the ovary? What are those hormones? How is their production regulated?
   Hilus cells are in the ovaries that produce the female sex hormones. The hormones that they produce are called estrogen and progesterone. These hormones are regulated by the hypothalamus, pituitary, and the ovaries. FSH and LH hormones are produced by the anterior pituitary, which helps regulate the production of hormones and the development of eggs.

7. In which cells are the male sex hormones produced? What are those hormones? How is their production regulated
   Leydig cells in the testes are responsible for producing the male sex hormones. The male sex hormone that is produced is testosterone. The hormone production is also regulated by FSH and LH hormones that are produced by the anterior pituitary. The FSH stimulates the maturation of sperm cells and it can also inhibit hormone production. LH stimulates the production of sex hormones.

8. What is the name of the tubes transporting mature sperm out of the testis?
   The tubes that transport mature sperm out of the testes are called the Vas Deferens.

9. In which layer in the ovary can the hilus cells be found? What is the function of the hilus cells?
   The hilus cells are found in the ovarian hilum and the mesovarium. It is analogous to the male Leydig cell. The hilus cells are responsible for producing the female sex hormones in the ovaries.

10. Which ligaments hold the ovaries in place? Describe the location of each ligament. Aside from holding the ovaries in place, identify another function of those ligaments?

    The ovarian ligament connects the ovary to the lateral surface of the uterus. It is a smaller ligament located superiorly and in between the uterus and the ovaries. The posterior portion of the broad ligament forms the mesovarium, which is what supports the ovaries and houses the arterial and venous supply. It is a flat sheet of peritoneum that extends from the lateral pelvic walls on both sides and folds over the internal female genitalia. The suspensory ligament of the ovary is responsible for attaching the ovary to the pelvic wall. It attaches to the pelvic wall via a continuous tissue called the peritoneum. It can easily be confused with the ovarian ligament.