Chapter 12: The Reproductive System

Sperm Production

Sperm are produced inside seminiferous tubules located in the testes. Sperm are produced by undergoing a special process known as meiosis. First on the walls of the seminiferous tubules, one spermatocyte divides into four identical cells called spermatids. These spermatids then are released into the lumen or central opening of the seminiferous tubule. From there these immature sperm are carried in a liquid to the epididymis, a long coiled tube that sits on top of each testis, where they mature. The sperm remain in the epididymis until the man ejaculates.

Ejaculation

Just prior to ejaculation, sperm moves from the epididymis to a tube called the vas deferens. The vas deferens joins with a duct from the seminal vesicle. The seminal vesicle secretes an alkaline fluid containing sugar and clotting enzymes which is added to the sperm. The prostate also secretes fluid into this mixture. The combination of this fluid and the sperm is called semen.

The Ovarian Cycle

The ovarian cycle is the process whereby an ovum is produced. It occurs at the same time as the menstrual cycle. At the beginning of the ovarian cycle, the oocyte, the cell which will develop into an ovum, is surrounded by a layer of cells. This entire structure, the oocyte and the layer of cells, is called a follicle. To develop into an ovum, the cells surrounding the ovum produce estrogen and a cavity forms in the follicle which fills with the estrogen and fluid. Then in the middle of the ovarian cycle the oocyte divides into two cells: a large cell called a secondary oocyte and a polar body (which quickly dies). At this time, the follicle, filled with fluid bursts and the secondary oocyte is released. At this time it divides into two cells again: a larger cell called an ovum and another polar body, which again dies. The ovum then enters the Fallopian tube. Meanwhile, the follicular cells change into a fat filled region called the corpus luteum which secretes progesterone. Progesterone tells the uterus to prepare for a fertilized egg.

The Menstrual Cycle

The menstrual cycle occurs at the same time as the ovarian cycle. During the menstrual cycle the uterus is preparing for the arrival of sperm and then for the arrival of the embryo. Day one of the menstrual cycle begins with day one of a woman's period. After a woman's period, on about day five, estrogen levels increase, causing the endomentrium, the layer closest to the cavity of the woman's uterus to thicken. This process is called proliferation. From day 14 to day 28, progesterone becomes the dominant hormone. This causes the endometrium to store large amounts of glycogen, a nutrition source for the embryo. If fertilization does not occur, progesterone production ceases and a new cycle begins with day one of menstruation.