**Objectives 9 - Unit 2 Ch 14** - Biology 3201: Spermatogenesis and Oogenesis. P. 477

**gametogenesis** - gamete formation when daughter cells, or gametes, are produced at the end of meiosis II resulting in the production of sperm and eggs. So, end result of meiosis - gametes

* **Spermatogenesis** - the process of male gamete production in animals.
* **Oogenesis** - process of female gamete production in animals

**Spermatogenesis**

* occurs in testes
* starts with diploid germ cell in childhood – **spermatogonium** (in testes)(2n- 46 chromosomes)
* at puberty, this cell forms a **primary spermatocyte**, which undergoes its first meiotic division, producing two cells (**secondary spermatocytes**), each containing double-stranded chromosomes, but half the chromosomes as the original
* each of these cells divide again, resulting in four cells (**spermatids**), each with single-stranded chromosomes, and half of the original.
* each sperm has the same number of chromosomes and the same amount of cytoplasm
* Up to this point, \*\* identical to the typical example of meiosis weve already covered\*\*
* after meiosis II each sperm cell develop into mature sperm, losing cytoplasm, head forming, and tail (flagella)

Oogenesis differs from Spermatogenesis in three important ways

* unequal cytokinesis (division of cytoplasm)
* while spermatogonium can continue to divide by mitosis throughout the life of a male, a woman is born with all the oogonia she will ever have
* oogenesis has long resting periods before the process is complete, where sperm go through its production in an uninterrupted sequence

**Oogenesis**

* occurs in ovaries
* germ cell - **oogonium** (2n)
* develop into **primary oocytes** (prophase I – before birth. Then rests until puberty)
* At puberty, a primary oocyte will undergoes its first meiotic division, producing two cells, each containing doubled chromosomes, but half the chromosomes as the original.
* one of these cells is visibly larger, and is termed the **secondary oocyte**.
* the smaller one is termed **polar body**
* secondary oocyte is what is released during ovulation
* meiosis II does not occur unless secondary oocyte is penetrated by sperm (after egg is released)
* both secondary oocyte and polar body divide again, resulting in four cells, each with single-stranded chromosomes, but half of the original.
* the three polar bodies disintegrate, while the **ovum** now fuses with the sperm

Only one egg- unequal distribution of cytoplasm supplies ovum with sufficient nutrients to support the developing zygote in the first few days following fertilization