ONPRC Module 1A: Female Reproductive System & Regulation of Ovarian Function

Guiding Question:

How does the female reproductive system work?

Module Question	Laboratory Questions
What are the important parts of the female reproductive system, and how does the menstrual cycle work?	• How does a scientist obtain ovaries for a study? • How do researchers look at follicle morphology? • How does female reproductive anatomy differ between mammalian species (mice, humans, monkeys, sheep, horses, cats, dogs)? • What can female reproductive anatomy tell us about pregnancy in the different species?

Learning Outcomes:

Identify female reproductive anatomical structures of different species (mice, humans, monkeys, sheep, horses, cats, dogs).

Explain the ovarian cycle (process of follicular development, ovulation, corpus luteum formation).

Explain the menstrual cycle (changes that occur in the uterus under the influence of ovarian hormones).

Define the source and function of hormones involved in the female reproductive system.

Female Reproductive System Vocabulary

Reproductive Science: A branch of science that deals with the mechanism and regulation of reproductive processes and the diagnosis and treatment of reproductive disorders.

Ovary – female reproductive organ that produces oocytes and the female sex hormones

Oocyte – the female germ cell, also known as an egg cell. The oocyte is the haploid (possessing half the number of chromosomes in the body) female reproductive cell or gamete.

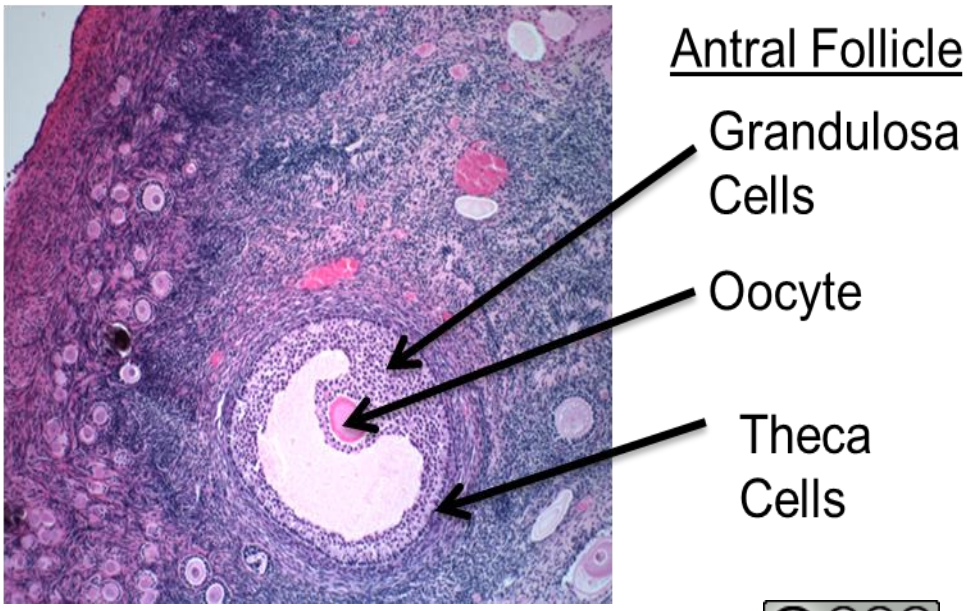
Follicle – In the ovary, follicles are the basic functional unit of the ovary. The follicle contains the oocyte surrounded by somatic cells that produce hormones such as estrogen.

Granulosa Cell – the somatic cell of the follicle that directly surrounds the oocyte and serves as a nurse cell for its maturation. Granulosa cells proliferate as the follicle grows, and they produce estrogens.

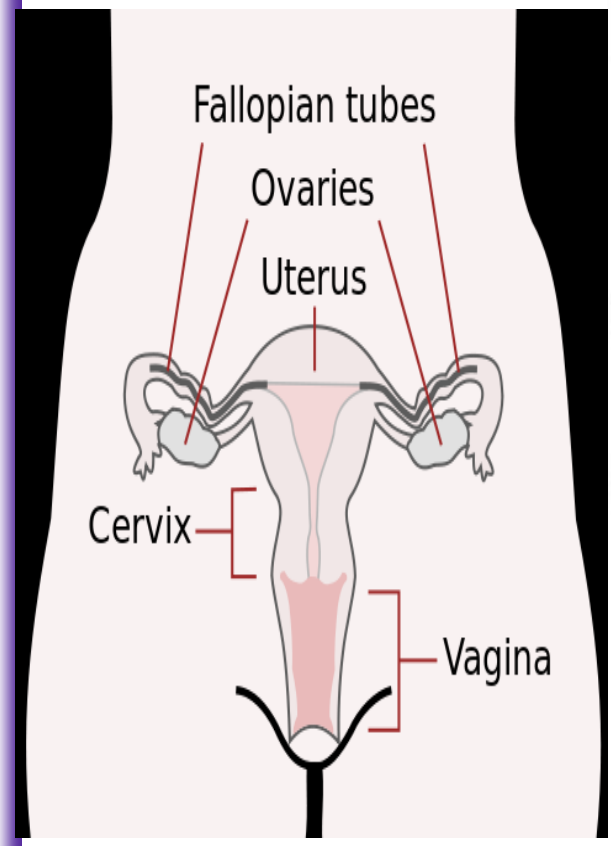
Thecal Cell – outer somatic cells of the follicle that surround the granulosa cells and produce androgen substrates for estrogen production in the granulosa cell.

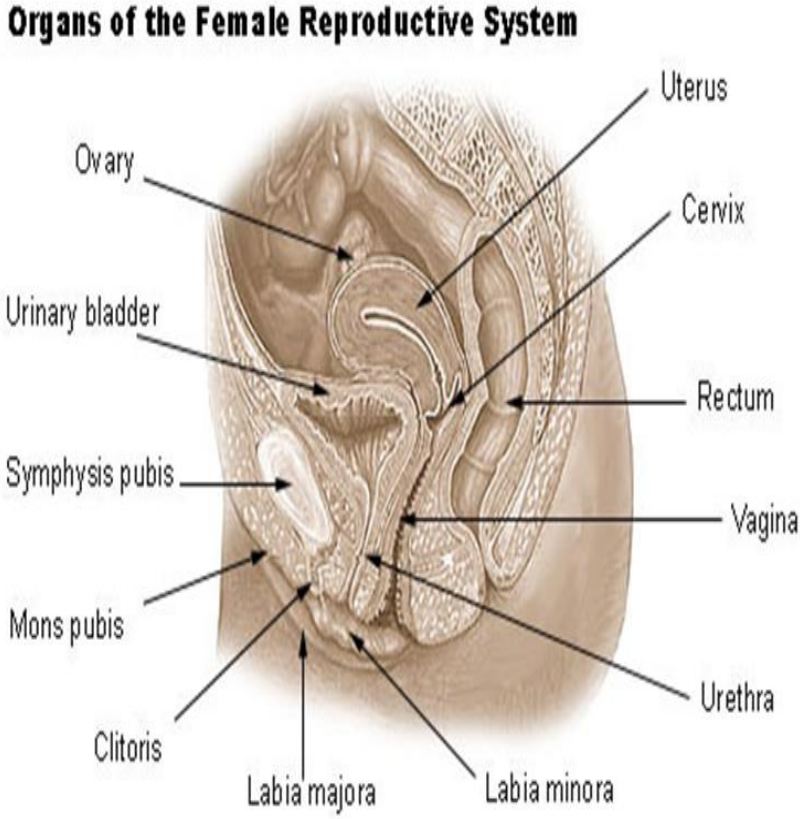
Vesicular (Graafian or Antral) Follicle: a mature liquid-filled follicle within the ovary that houses a developing oocyte.

Photo: Dr. Mary Zelinski, ONPRC



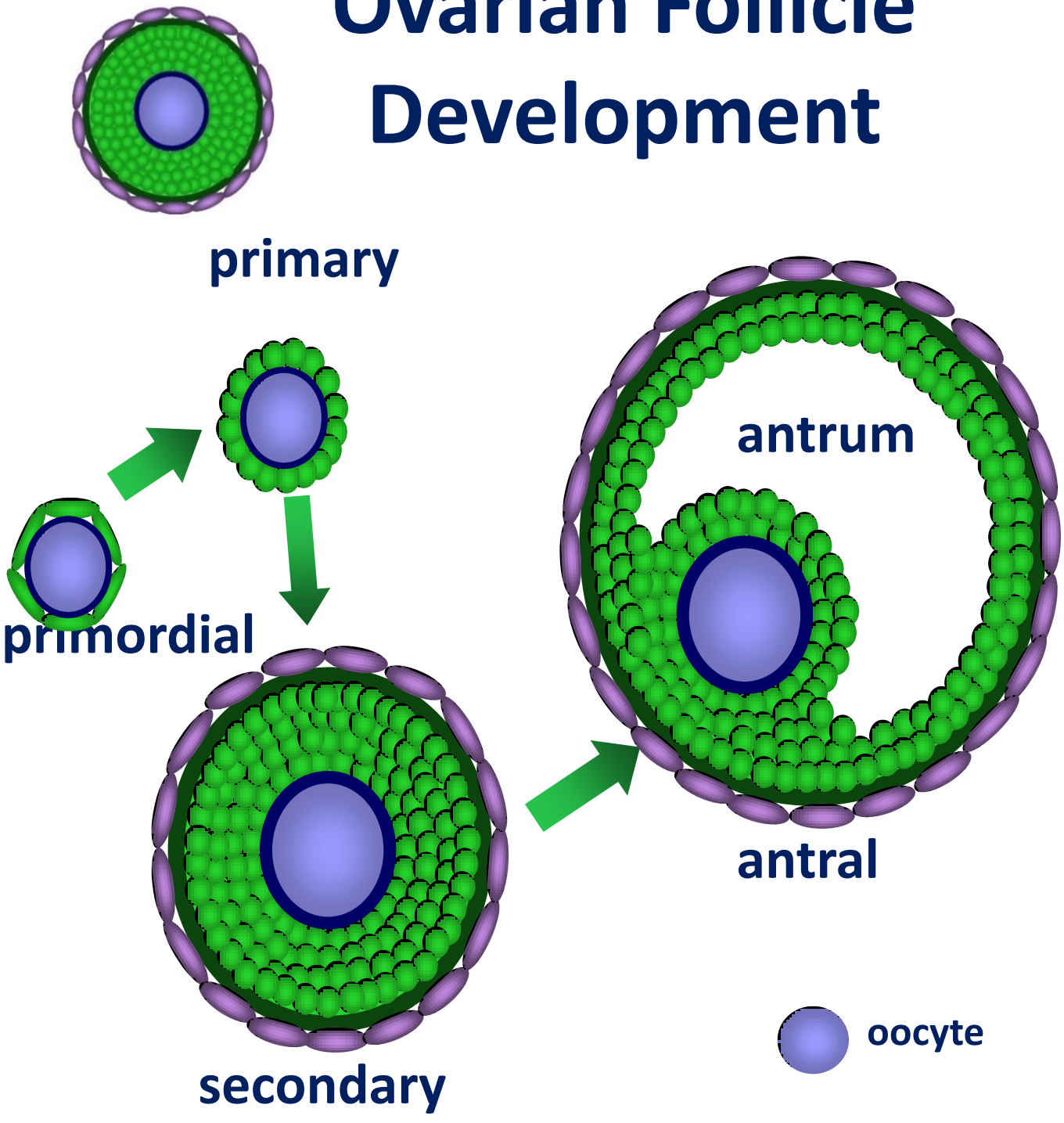
Human Female Reproductive System





http://commons.wikimedia.org/wiki/File:Scheme_female_reproductive_system-en.svg (left image)
http://training.seer.cancer.gov/anatomy/reproductive/female/ (right image)

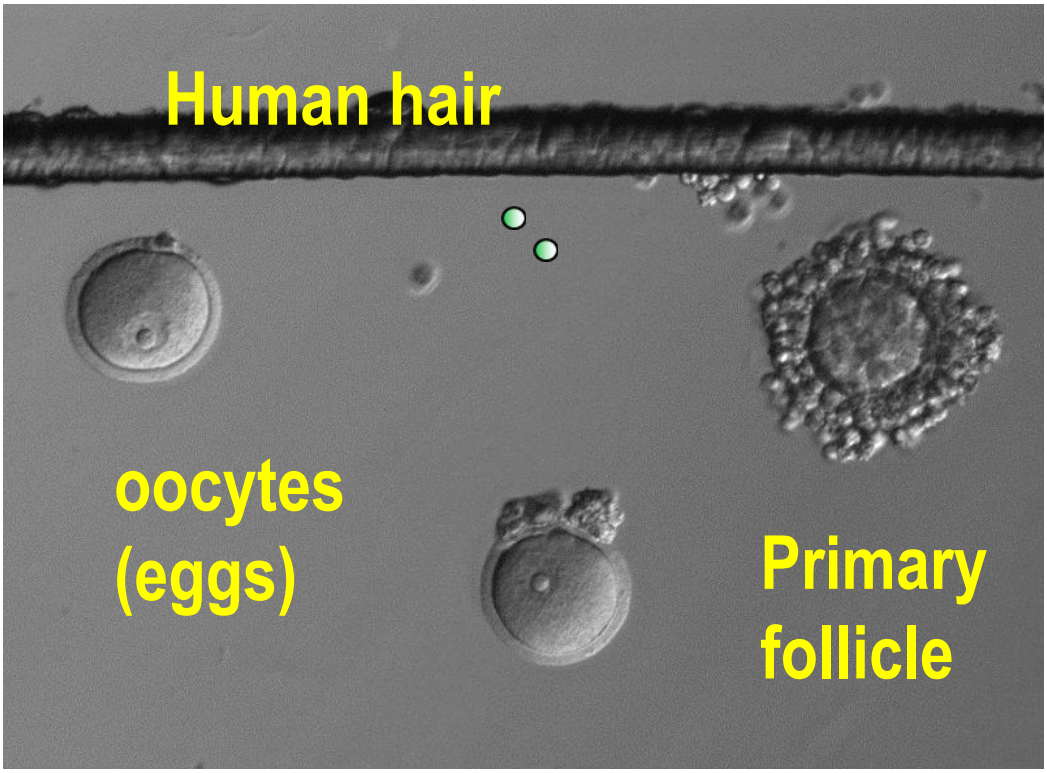
Ovarian Follicle Development



Graphic: The Oncofertility Consortium

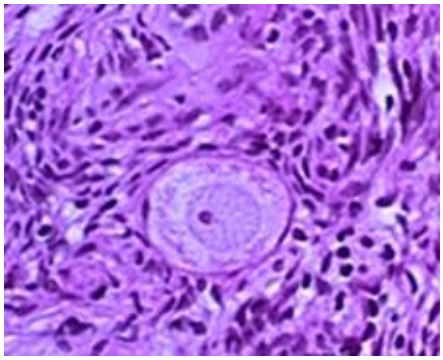
Relative Size of Follicles and Oocytes

Oocyte with Nucleus

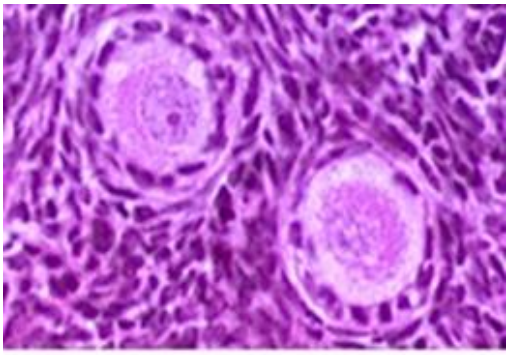


Photos: The Oncofertility Consortium

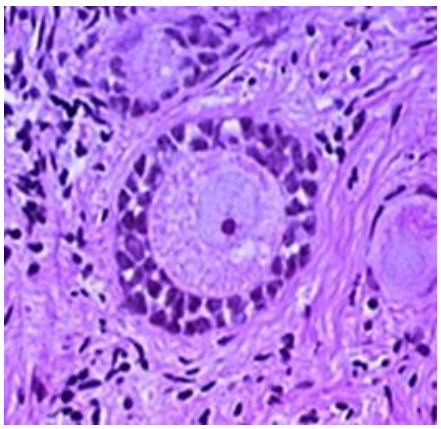
Ovarian Follicles



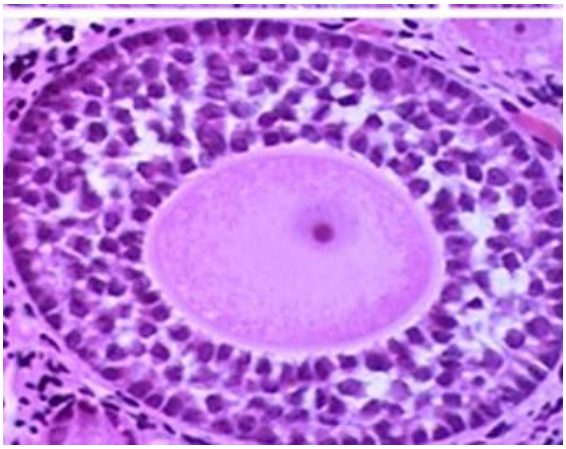
Primordial Follicle



Primary Follicle



Secondary Follicle



Multilayer Follicle

Photos: Dr. Mary Zelinski, PhD, ONPRC

Ovary with Follicles

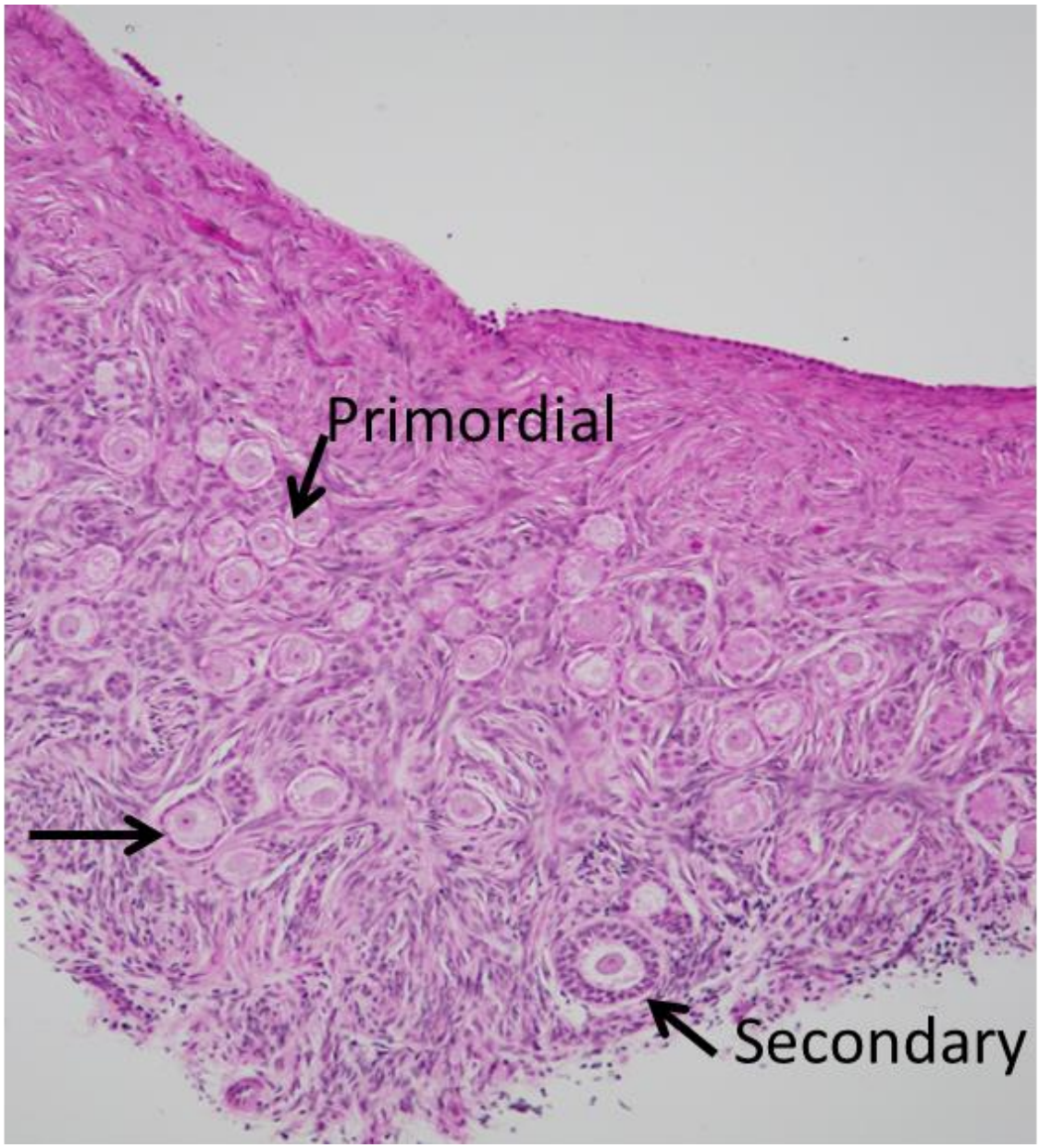


Photo: Mary Zelinski, PhD, ONPRC