

GENERAL EMBRYOLOGY



2021

School of Medicine

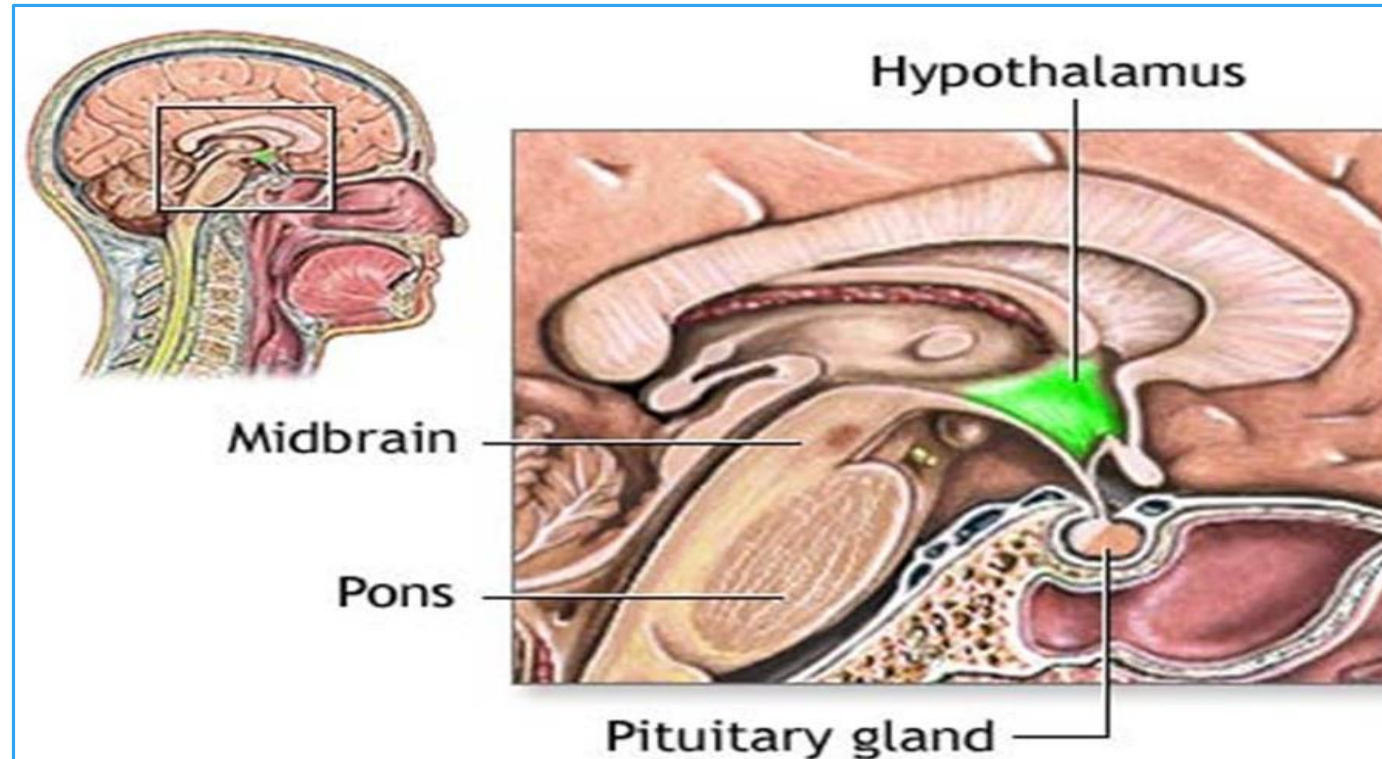
Department
of
Anatomy and Histology
School of medicine
The University of Jordan

O O G E N E S I S A T P U B E R T Y

At **puberty the female** begins to undergo **regular monthly cycles** called
sexual cycles

Sexual cycles are under the control of the

Hypothalamus



1 Hypothalamus



Gonadotropin releasing hormone (GnRH)



2 Anterior lobe (adenohypophysis) of the pituitary gland

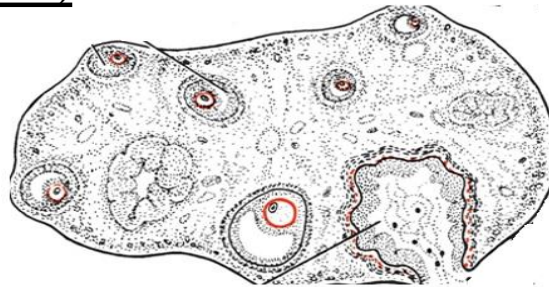


Gonadotropins

Follicle-stimulating hormone (FSH)

Luteinizing hormone (LH)

3- Ovary



Ovarian Cycle

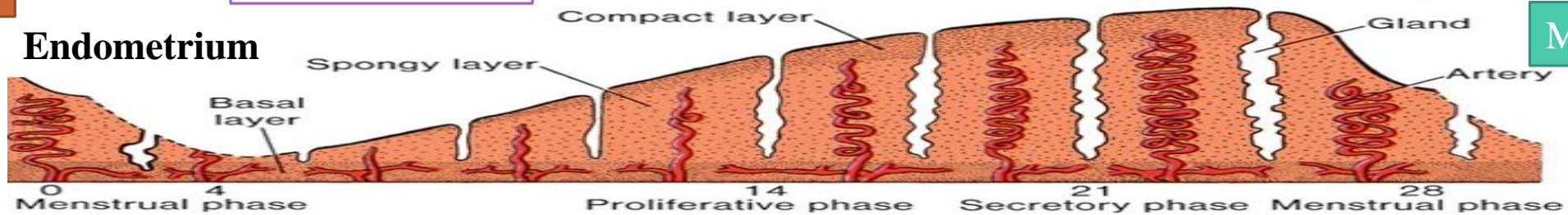
Estrogen

Progesterone

4- Uterus

Endometrium

Menstrual cycle)



Ovarian Cycle

FSH and LH produce cyclic changes in the ovaries



Follicular Development

FSH (Follicle stimulating hormone)

Stimulates

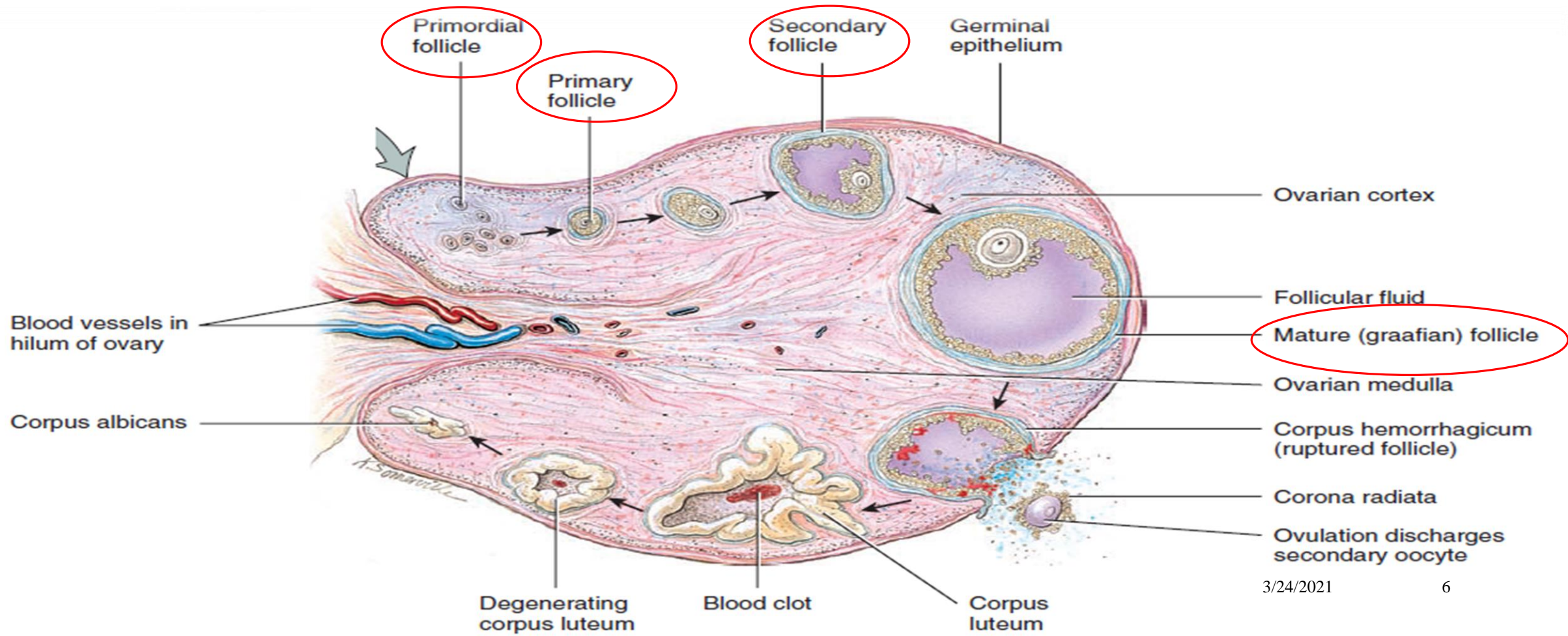
15 to 20 follicles selected to be mature and pass through 3 stages *each month*, and only one of these follicle reaches *full maturity*

Primordial follicle

1. Primary (preantral) follicle

2. Secondary (antral) follicle

3. preovulatory (Graafian) follicle



(a) Frontal section

HOW THE PRIMORDIAL FOLLICLE BECOMES PRIMARY?



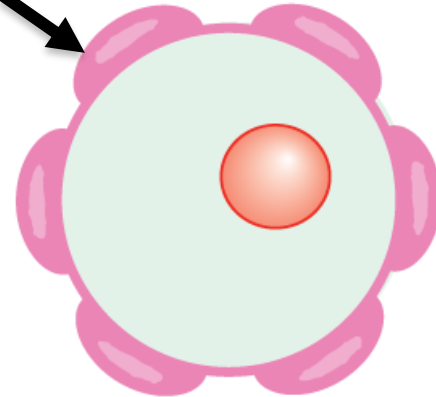
FSH



Stimulate follicular (granulosa) cells around oocyte

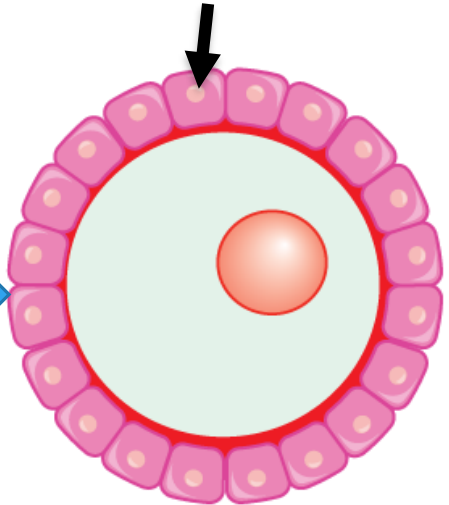


Flat epithelial



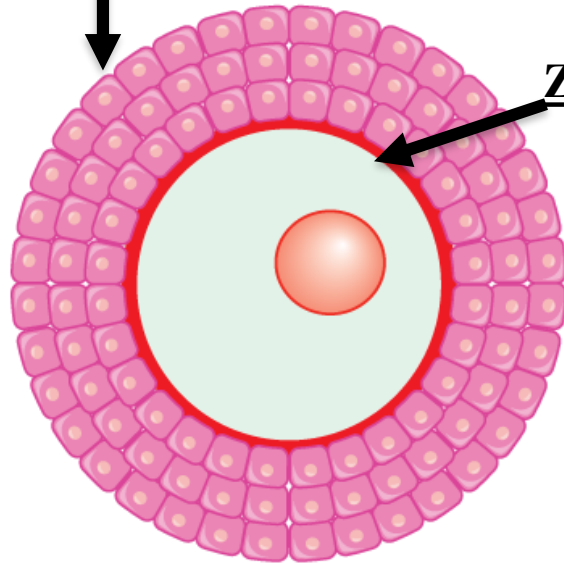
Primordial follicle

Cuboidal epithelial



Growing follicle

Stratified epi. Of granulosa



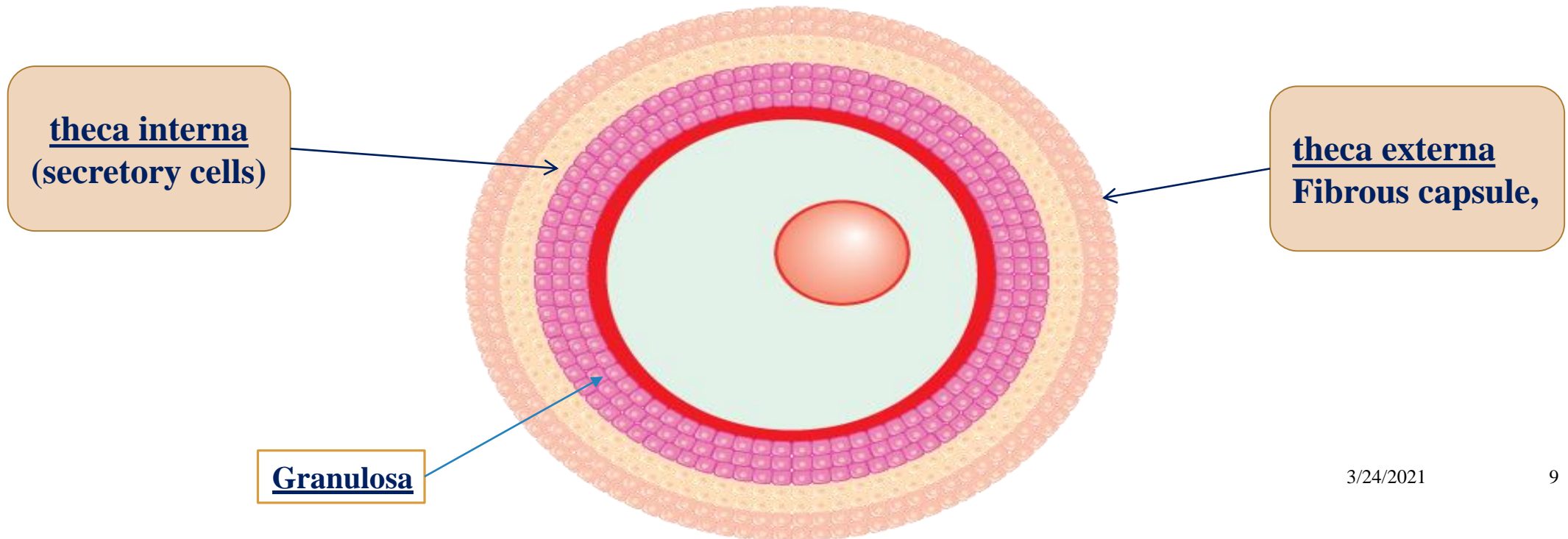
Primary follicle

Zona pellucida

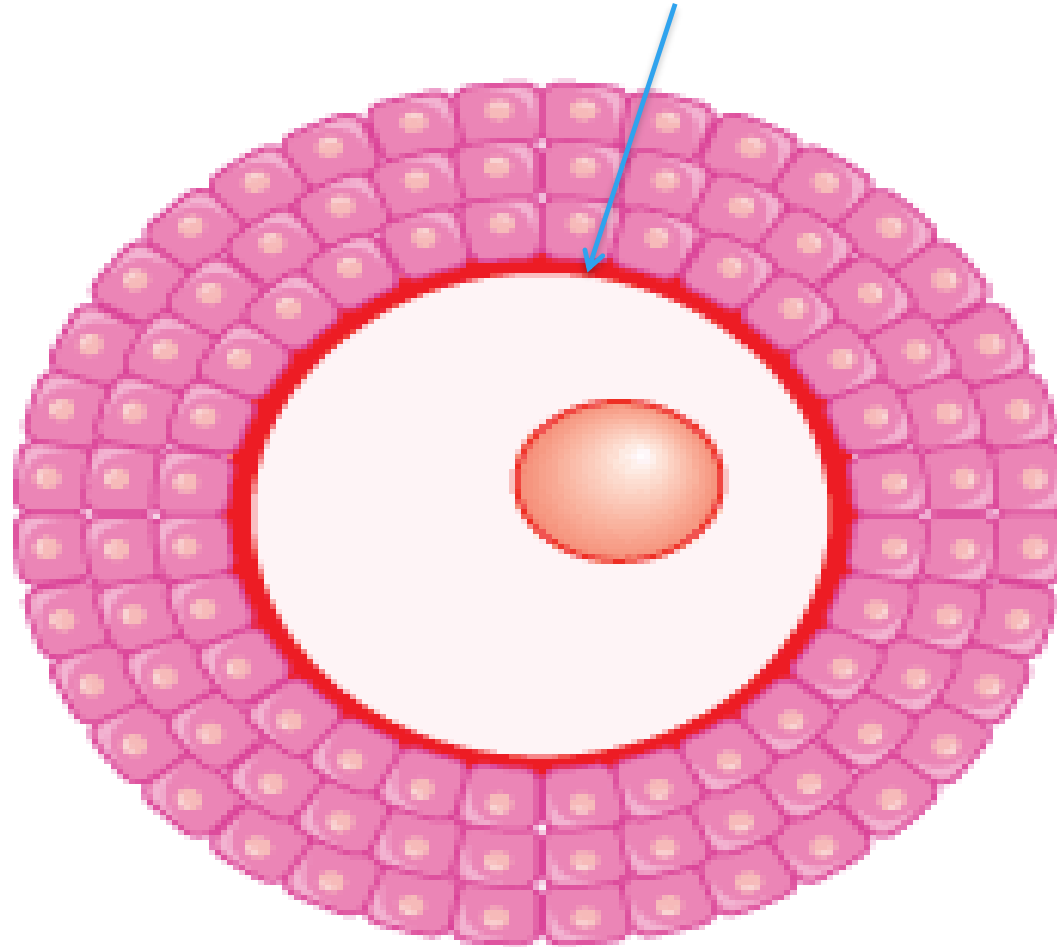
As the Primary follicle
continue to grow

Primary Follicle

Granulosa cells rest on a basement membrane separating them from surrounding ovarian connective tissue (stromal cells) that form the(theca folliculi)

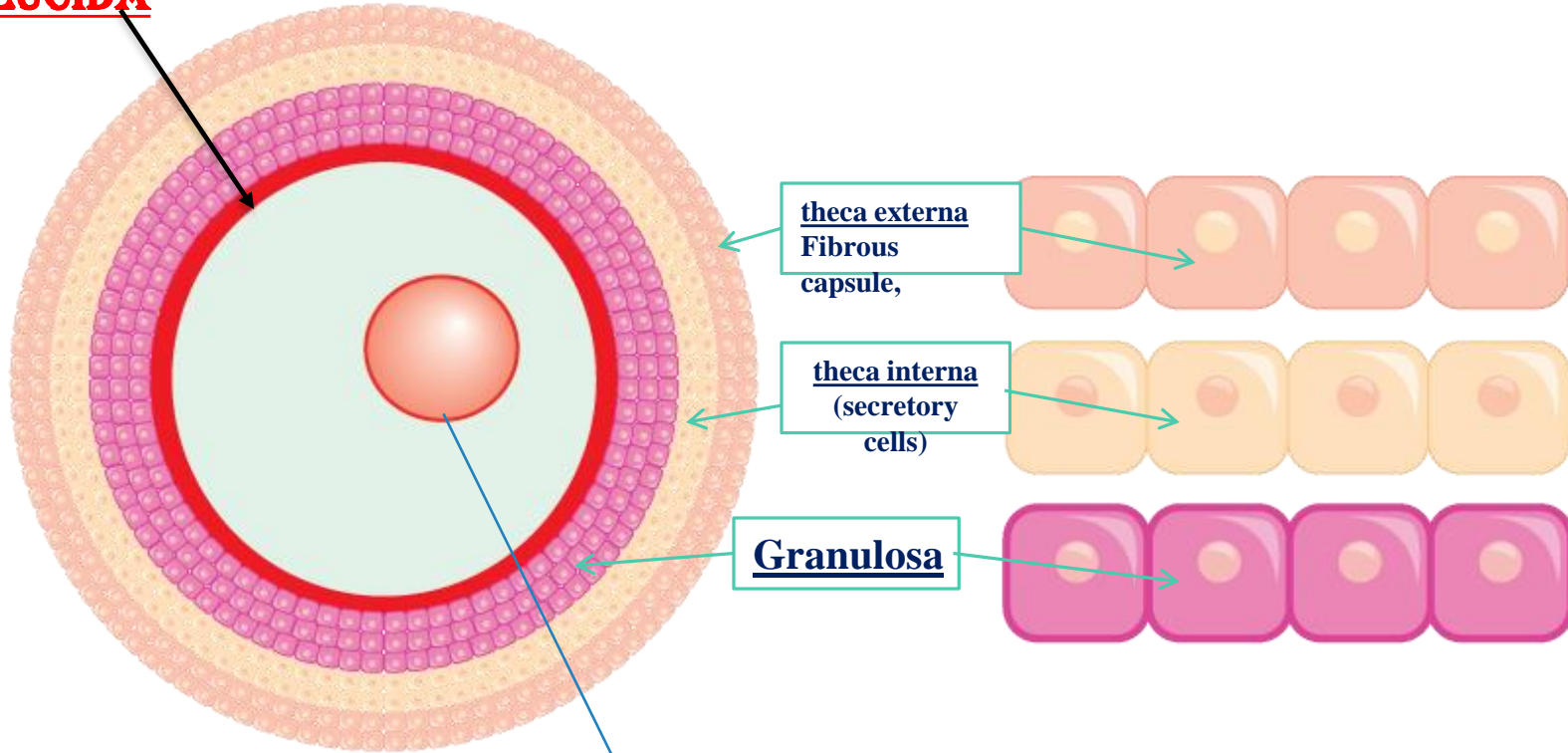


Granulosa and primary oocyte Secrete a layer of glycoproteins on the surface of the oocyte, forming the
(zona pellucida)



So the primary follicle has all of the following parts

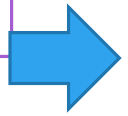
ZONA PELLUCIDA



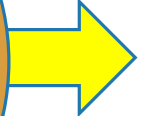
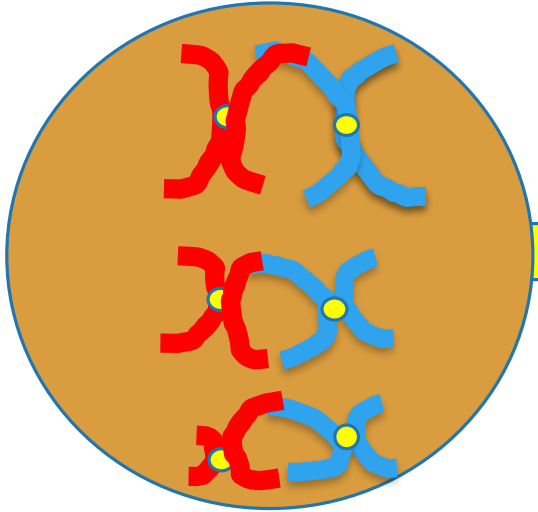
What about the **OOCYTE**?



The oocyte is



Primary oocyte arrested in diploten stage of prophase of MEIOSIS I



2n, **Double** structured

FEATURES OF THE PRIMARY FOLLICLE

Important

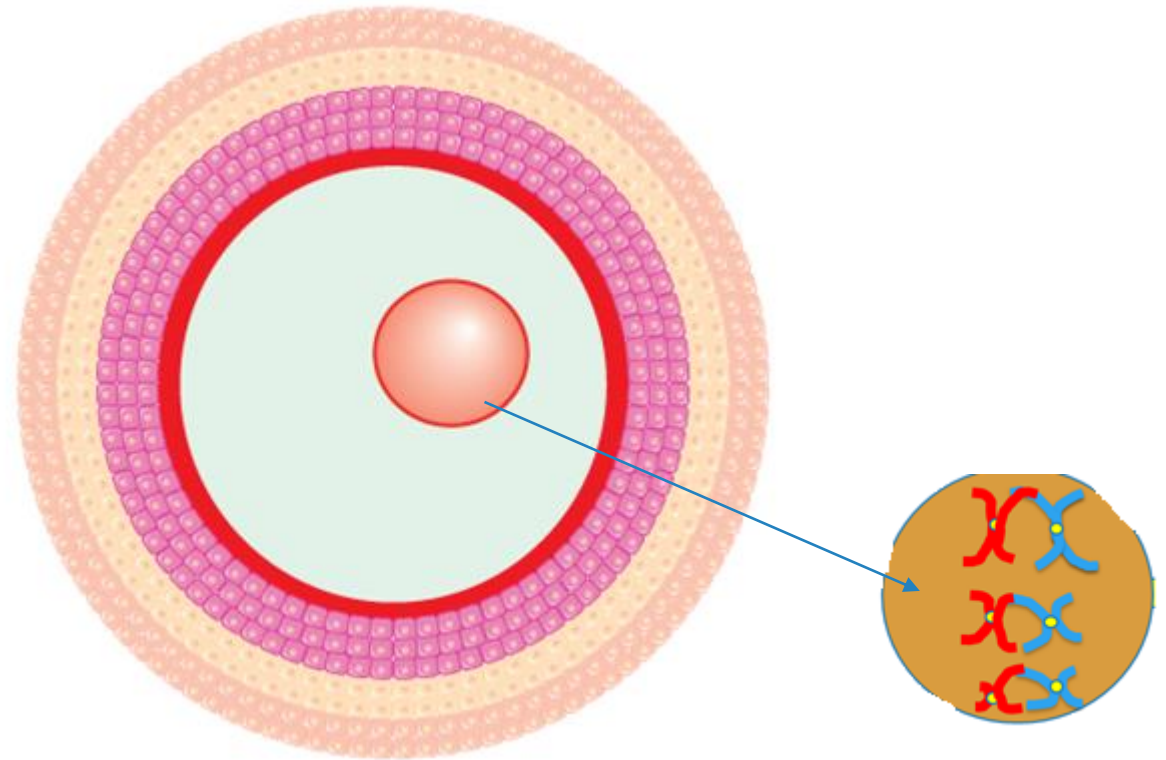
Theca externa Fibrous capsule

Theca interna (secretory cells)

Granulosa cells

ZONA PELLUCIDA

Primary oocyte arrested in diploten stage of prophase of MEIOSIS I



Primary oocyte arrested in diploten stage of prophase of MEIOSIS I

**Primary
follicle**

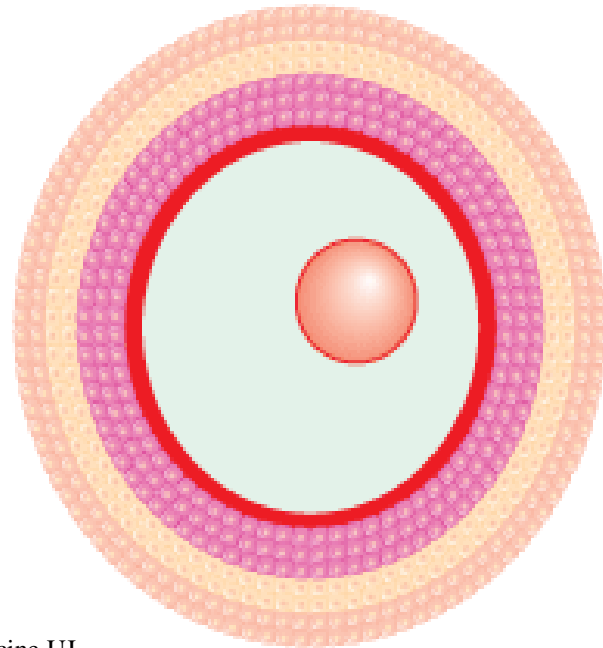
To

**Secondary
Follicle**

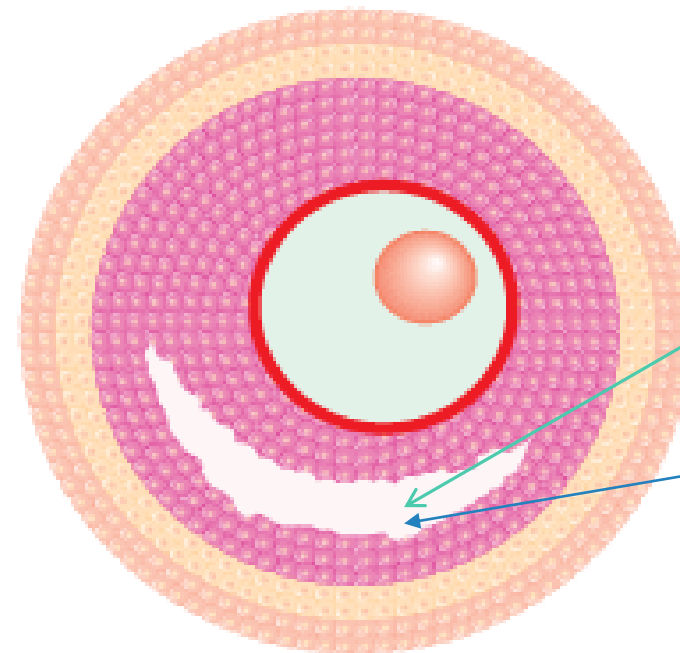
fluid-filled spaces appear between granulosa cells (antrum)

At that moment when antrum appeared follicle is termed (a vesicular or an antral or secondary follicle)

**Primary
follicle**



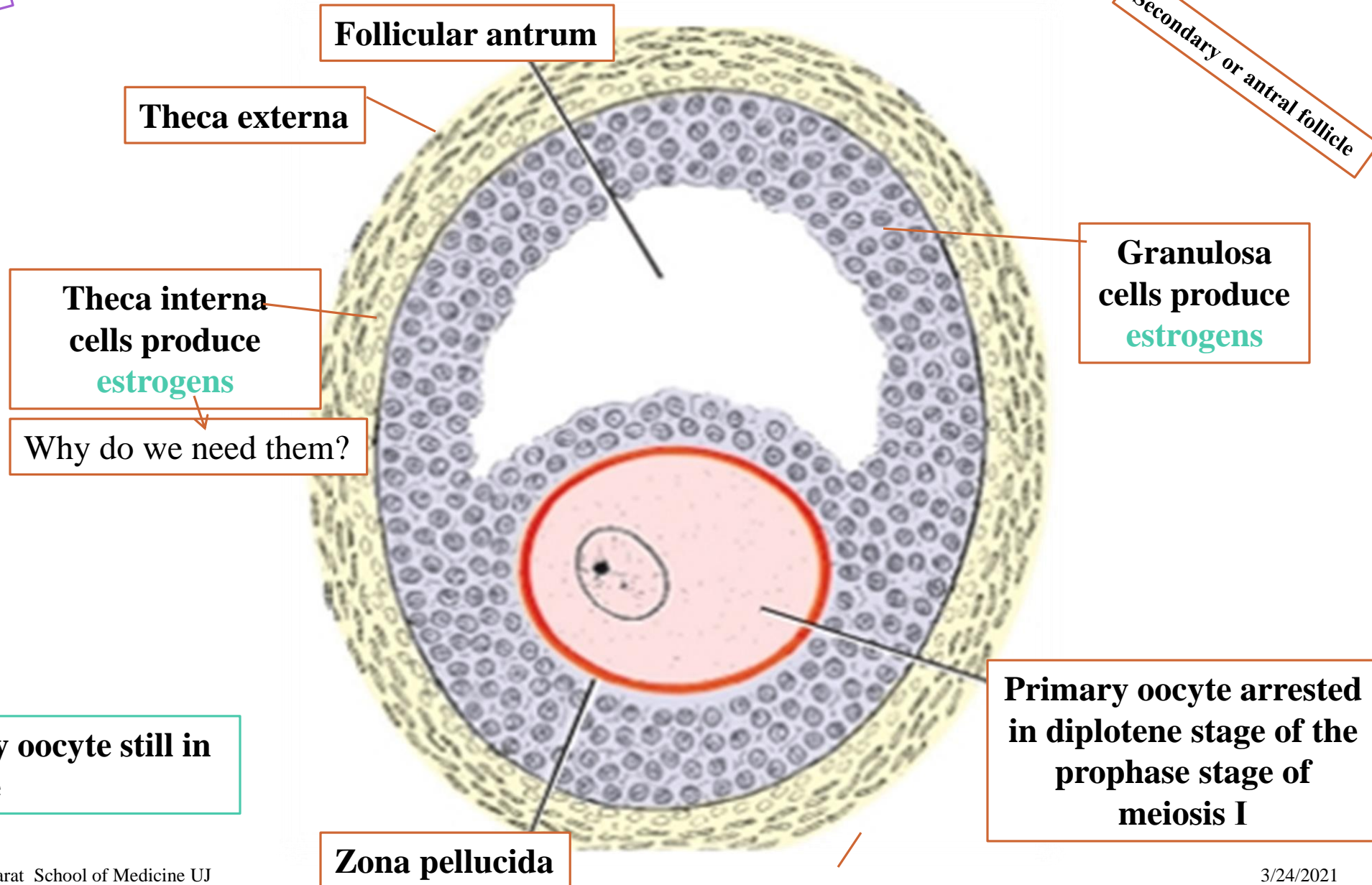
**Secondary
Follicle**



antrum

FEATURES OF THE SECONDARY FOLLICLE

Important



Theca interna cells produce estrogens

Why do we need them?

Granulosa cells produce estrogens

Primary oocyte arrested in diplotene stage of the prophase stage of meiosis I

Zona pellucida

Note: primary oocyte still in diploten stage

When the secondary follicle is mature,
a surge in **luteinizing hormone (LH)**

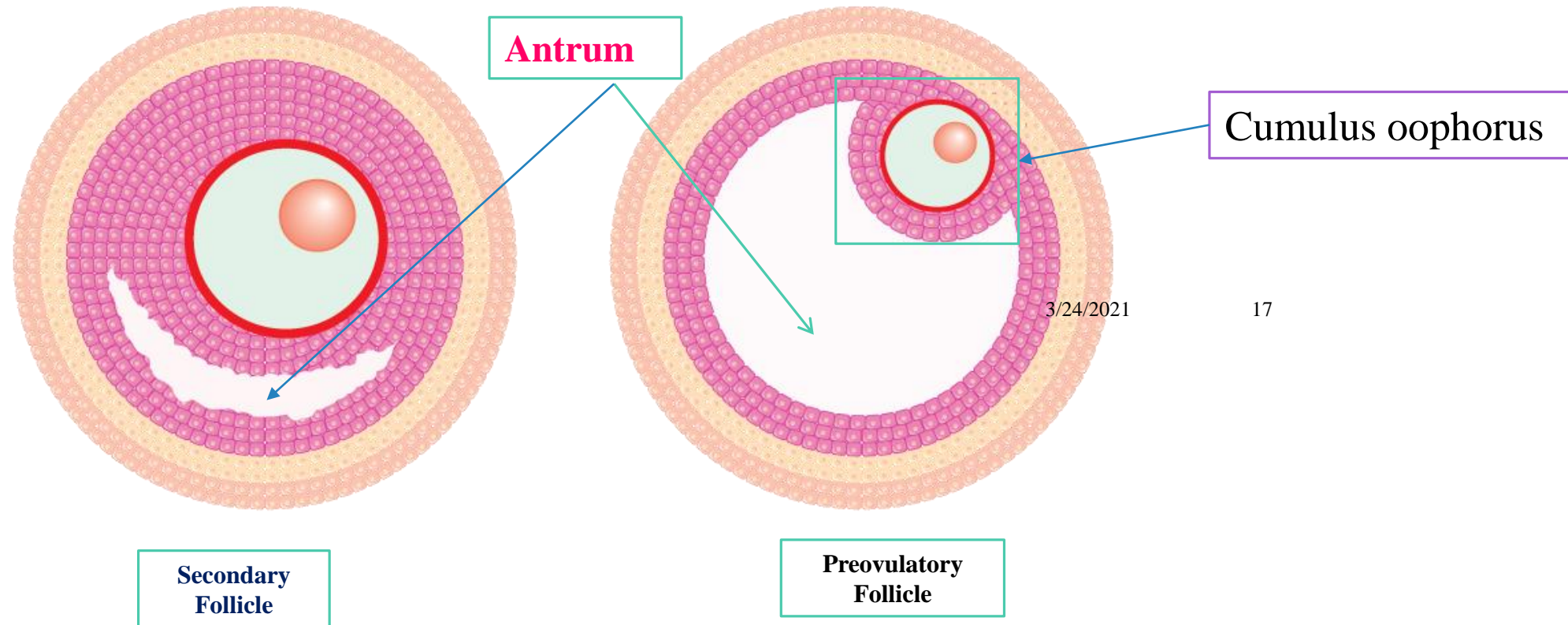


promote the Preovulatory growth phase

Under the influence of (LH)

Antrum gets **enlarged** with time

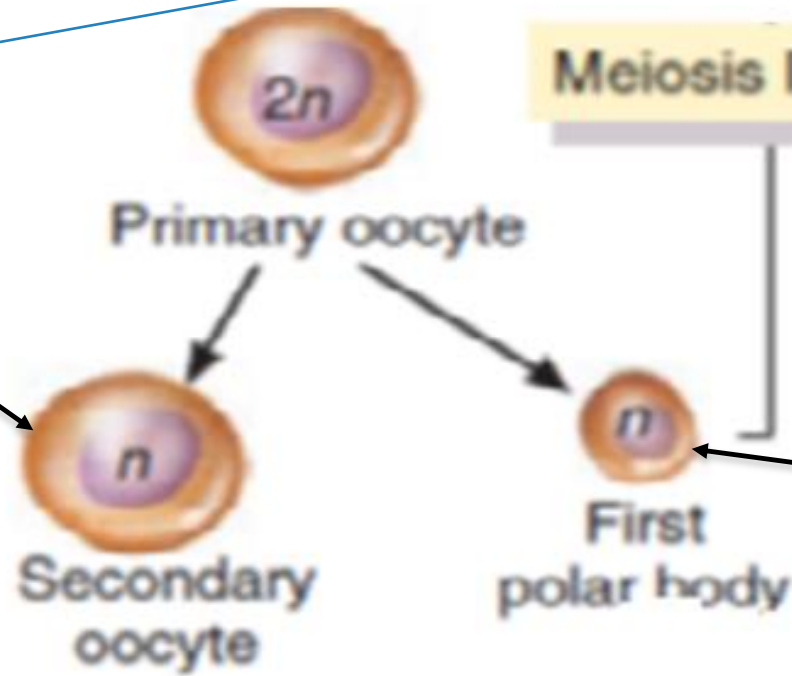
Granulosa cells surrounding the oocyte **remain intact** and form the *cumulus oophorus*



What about the oocyte?

By influence of (LH)
Meiosis I is completed,
resulting in formation of two daughter cells

THE SECONDARY OOCYTE
(enters meiosis II
And arrested in
Metaphase)
3 hours Before ovulation



THE FIRST POLAR

FEATURES OF THE PREOVULATORY (GRAAFIAN FOLLICLE)

