



UNIVERSITY of  
TERAMO

# *Reproductive Biotechnologies*

## REPRODUCTIVE CYCLE IN THE SOW

### IVM TECHNIQUES

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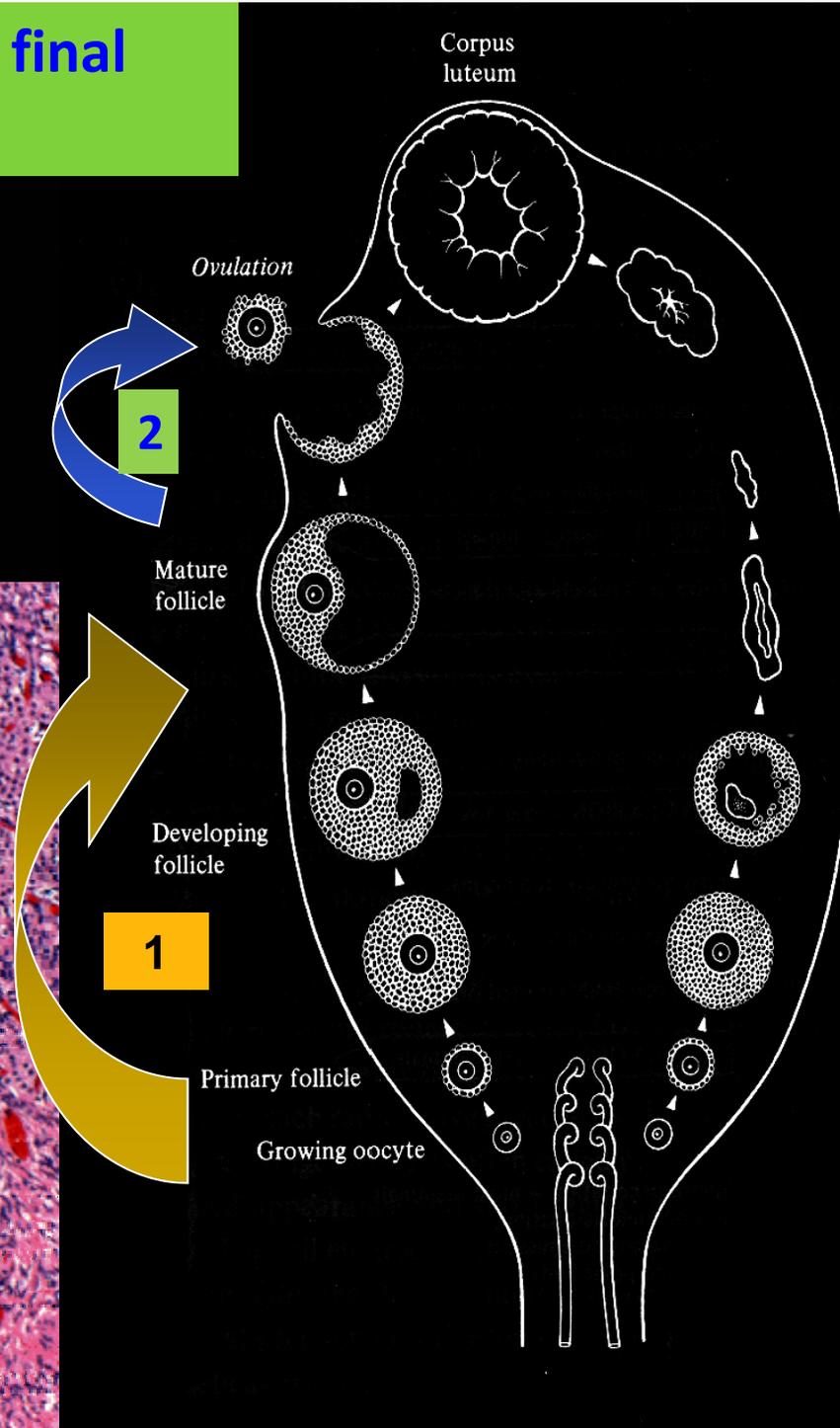
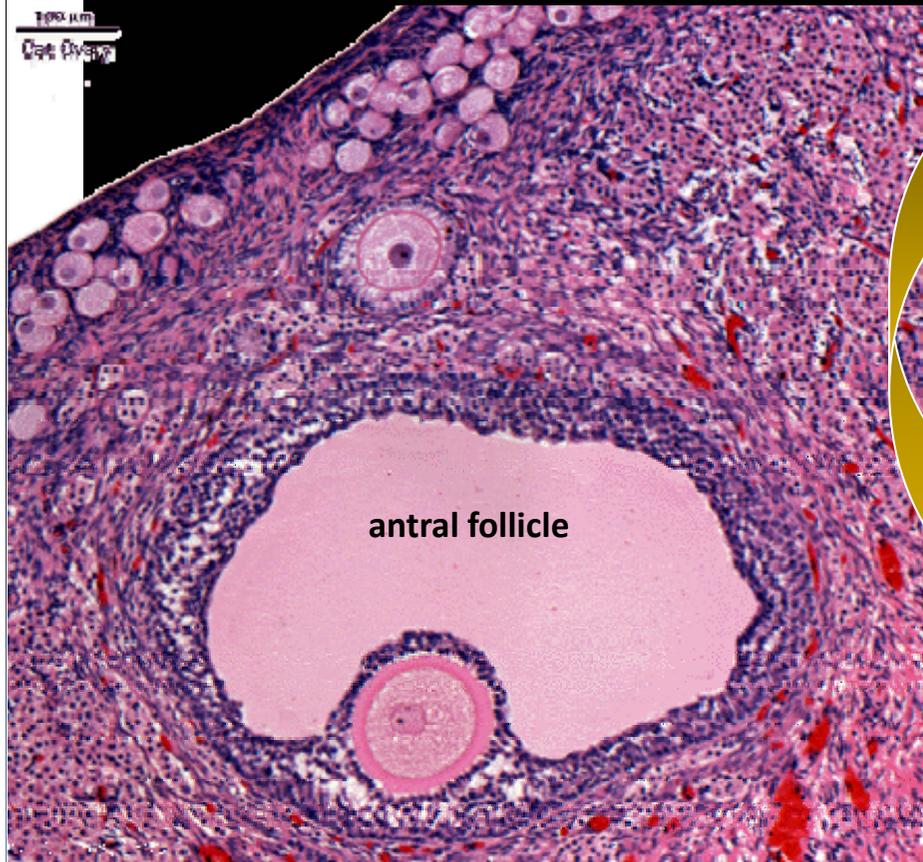
# FORMATION AND STRUCTURE OF OVARIES

A major function of ovarian tissue is

- to be **the site of multiplication of the germ cell (GC) line during prenatal development** and then
- to be the **a storage site for primary oocytes throughout postnatal life** until reserves of these unique cells are exhausted

# The oocyte maturation is the final phase of the oogenesis

The oocyte has previously experienced a long *period of growth* realized inside the ovary, in parallel with the follicle growth and development (1)

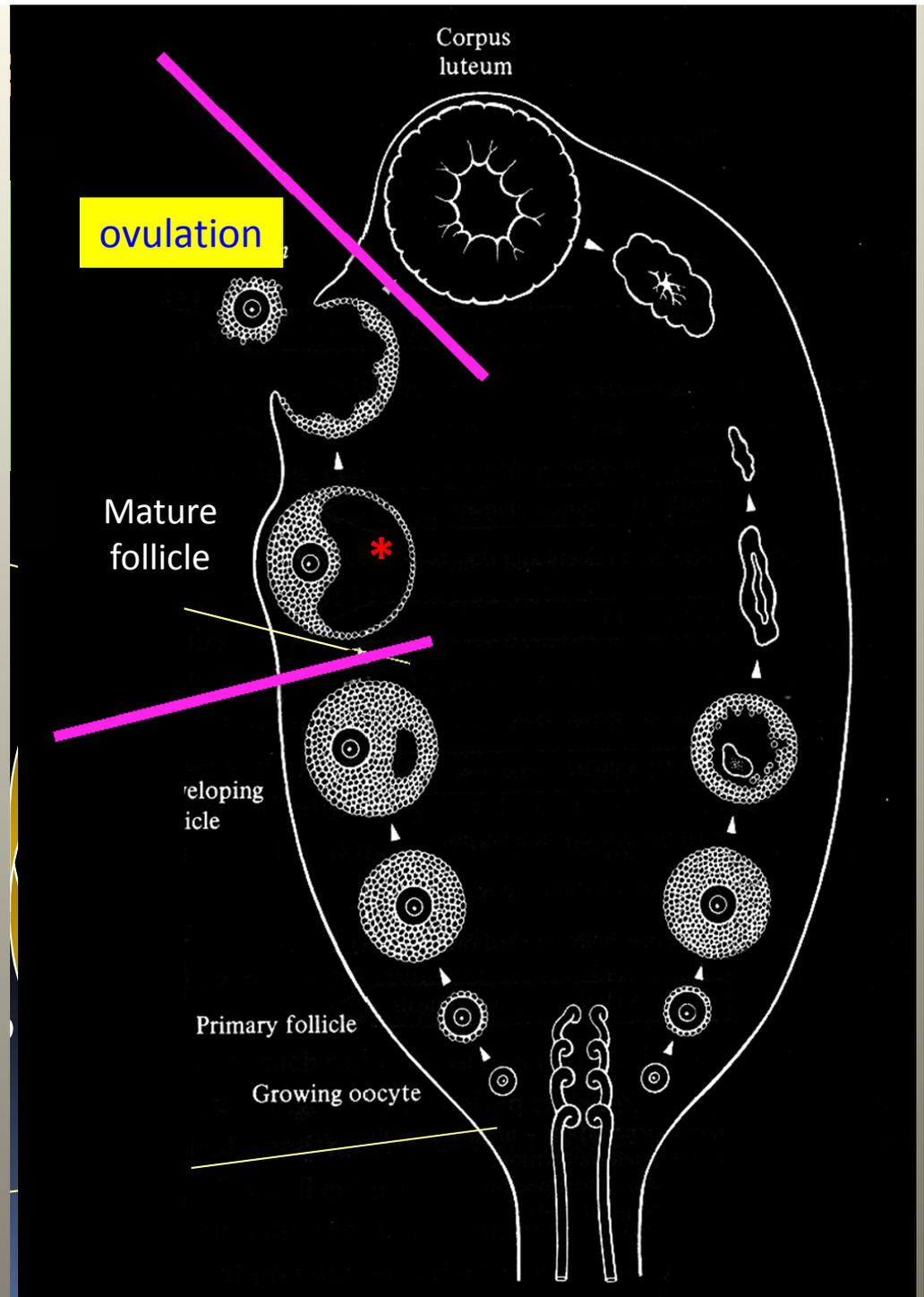


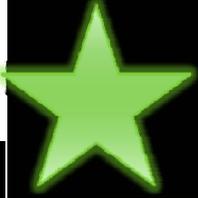
# OOCYTE MATURATION

-Final phase of folliculogenesis

The fate of most germ cells is degeneration but a small proportion will progress through the steps of ovarian folliculogenesis.

➔ Only when included within a **well-developed antral follicle \*** (named *mature follicle* or *Graafian follicle*) does liberation of an oocyte from the ovary at **OVULATION** become a possibility





*Both phases are equally important!!!*

## **IVM protocols:**

- Follicles/COCs selection
- Correct culture conditions

We can't change what occurred during the growth phase, we can only pay attention to correctly select the follicles that we will use for IVM!!!

We can lost all the benefits acquired by healthy follicles/oocytes in vivo during the growth phase if we will use wrong IVM conditions!!!

What follicles/COCs have to be selected for IVM?

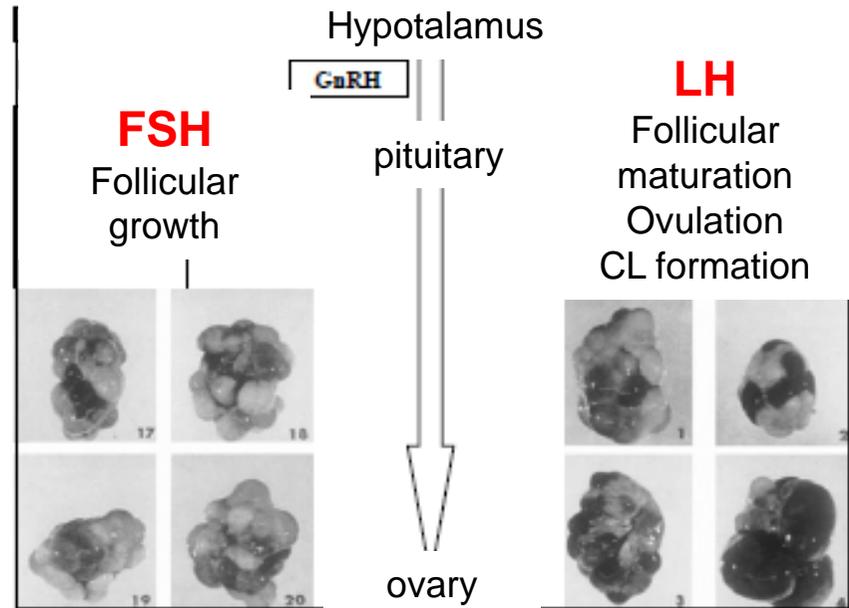
# IVM protocols: selection of Follicles/COCs



- **HEALTHY** (not atretic)
- **ANTRAL**
- **FULLY GROWN** } (meiotic competence)
- **IMMATURE** (not expanded)

# OVARIAN REPRODUCTIVE PHYSIOLOGY IN THE SOW

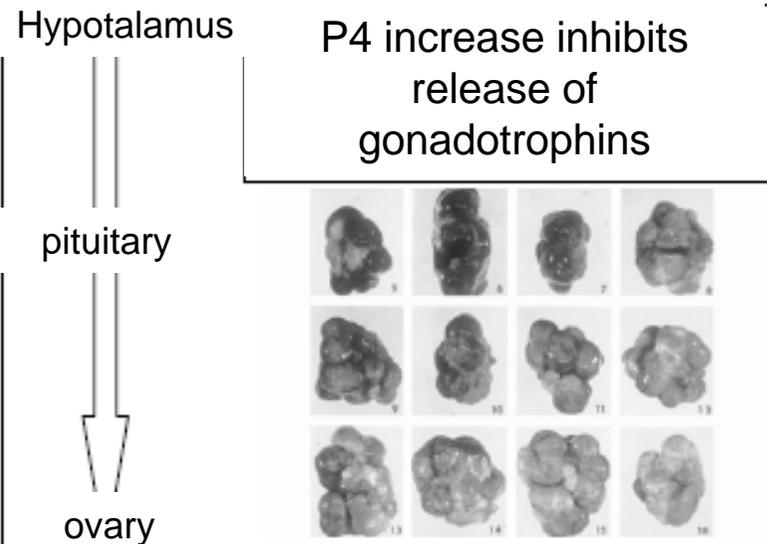
## hypothalamic-pituitary-ovarian axis and reproductive hormones



**FOLLICULAR PHASE (pro-oestrus/oestrus)**  
Synthesis of **oestrogens** predominates

### LUTEAL PHASE (metoestrus/dioestrus)

Synthesis of **P4** predominates



From MV Falceto Recio

In antral follicles, follicular growth and maturation depend on the secretion of the gonadotropins FSH and LH by the anterior pituitary gland

## Antral follicles the sow

Transparent, fluctuating and filled with follicular fluid in the follicular antrum. Oestrogens are produced in these follicles.

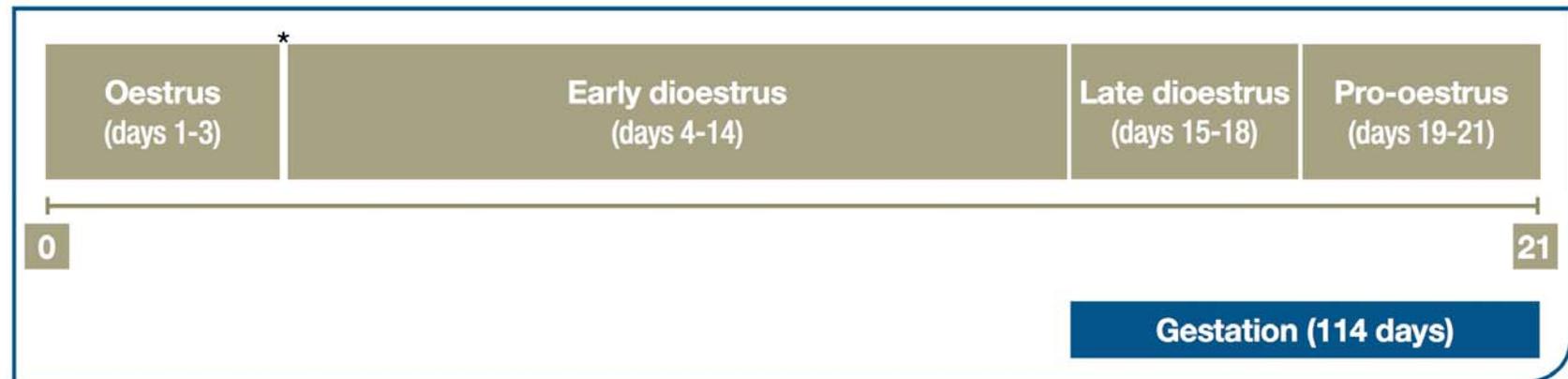
Table 1. Follicular size.

Follicle	Very small	Small	Medium	Large
Size (mm)	<2	2-3	4-6	7-12

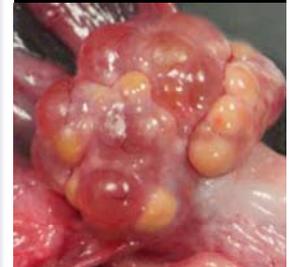
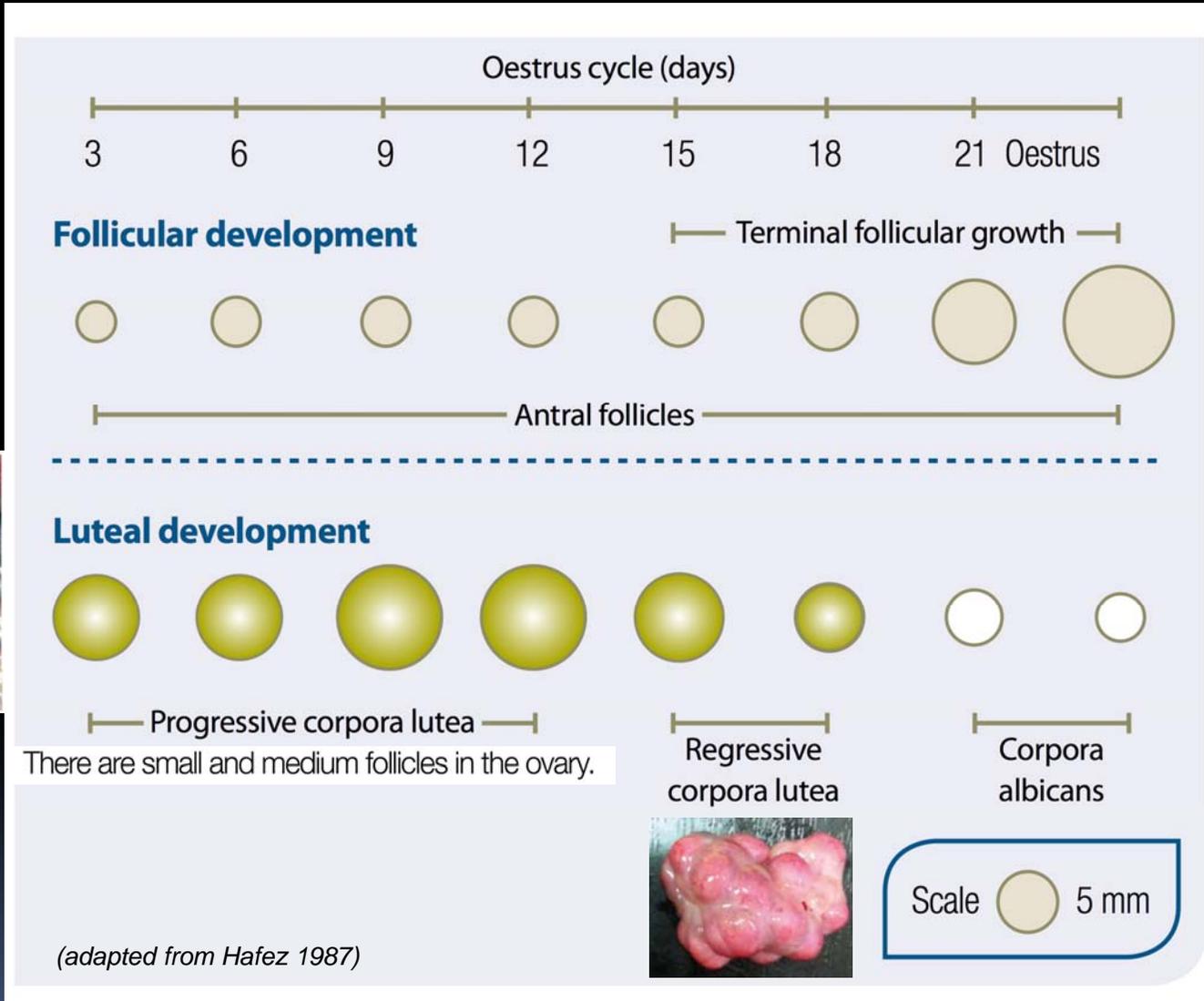


# Phases of reproductive cycle in the sow

- Pro-oestrus: period of follicular growth.
- Oestrus: period of final maturation of the follicle and ovulation. The sow allows mating/AI.
- Metaoestrus (\*): period immediately after ovulation with presence of corpora haemorrhagica.
- Dioestrus: early phase with functional corpora lutea and maximum production of P4 and late phase with regression of the corpora lutea after luteolysis and decreased production of P4.



# Follicle and luteal dynamics in the sow



Corpora albicans and growing follicles are present