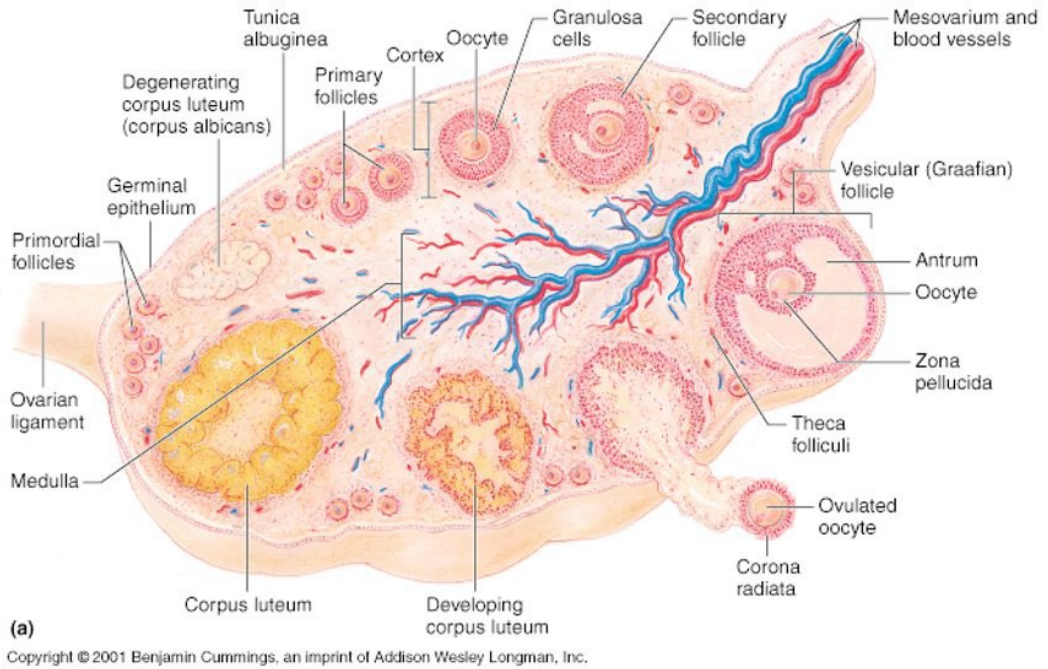
Progesterone

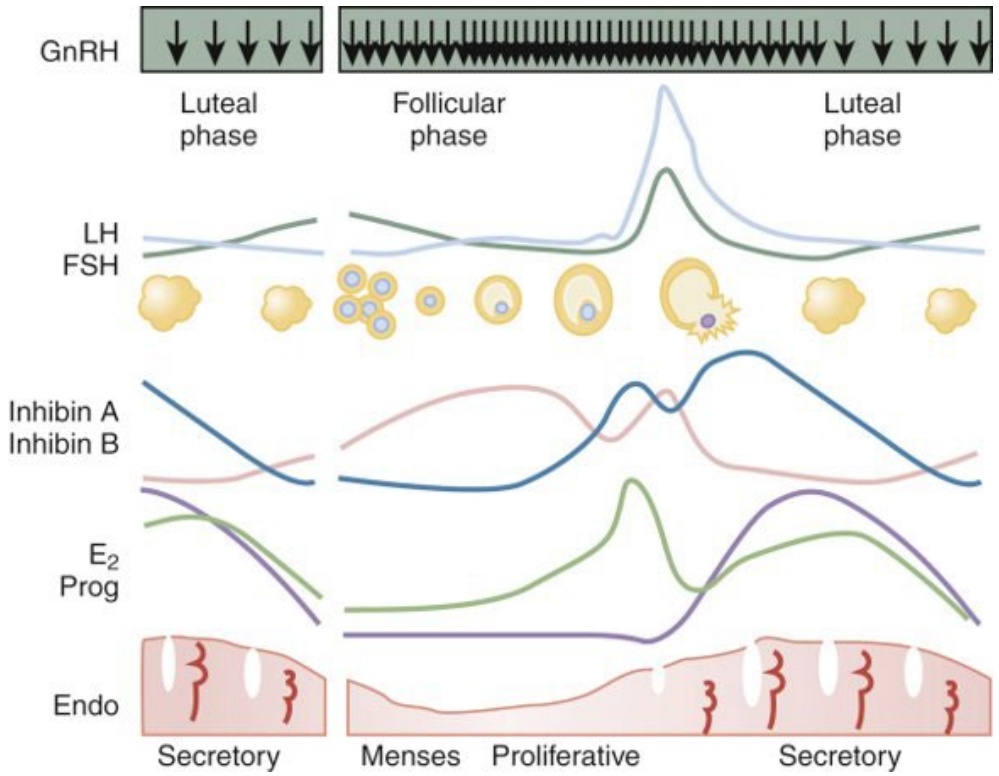
Progesterone Synthesis

- Progesterone is predominantly made in the ovaries of cycling women
- After ovulation, the granulosa cells in the ovary transform (under the influence of LH) into the corpus luteum
- Corpus luteum makes progesterone for approximately 14 days



About Progesterone

- Progesterone predominantly serves to retain the lining of the uterus, allowing for implantation and pregnancy to occur
- If pregnancy occurs, HCG signals for the corpus luteum to continue. Without that, the corpus luteum degrades and progesterone drops, triggering a menses
- It also supports sleep, mood, and memory and helps protect against endometrial cancers, osteoporosis, and cardiovascular disease



Hall, J.E. 2019. Yen and Jaffe's Reproductive Endocrinology

Progesterone Balance

- Progesterone is more commonly low (compared to high) in cycling women
- **High progesterone** in a cycling woman may be:
  - Normal, just at the end of the bell curve of “normal”
  - Asymptomatic
  - Slightly elevated progesterone is not normally indicative of a problem
  - Sometimes, women may experience fatigue, increased appetite, breast tenderness, and bloating, or premenstrual symdrome (PMS)
- If progesterone is high, it is most commonly related to obesity, insulin resistance/blood sugar imbalance, but can also be other causes including pregnancy, congenital adrenal hyperplasia (CAH & NCCAH), thecal cell tumors (rare) and other causes

Low Progesterone

Far more common in cycling women

Symptoms

- Fatigue
- Insomnia
- Anxiety
- Weight gain
- Infertility
- Low bone mineral density
- Premenstrual Syndrome (PMS)
- Heavy bleeding
- Irregular bleeding
- Breast tenderness

Low Progesterone- Potential Root Causes

- Anovulation
- Stress
- Thyroid disorders
- High prolactin
- Some medications
- Perimenopause
- Caloric deficit
- Decreased ovarian health & Premature ovarian insufficiency
- Breastfeeding
- Hypogonadism
- Hypopituitarism

Potential Support Options

- Assess & treat the underlying cause
- Antioxidant support to support ovarian cell health
  - B6, vitamin C, melatonin, others
- Hypothalamus-Pituitary-Ovarian (HPO) Support
  - Herbal medicines
  - Stress reduction
- Bioidentical progesterone supplementation
  - Cream
  - Oral
  - Vaginal

Progesterone Metabolism

- Liver is responsible for progesterone metabolism and the half life is only about 5 minutes
- Progesterone is primarily metabolized into
  - 5a-dihydroprogesterone (by 5a-reductase)
  - 5b-dihydroprogesterone (by 5b-reductase)
  - These are further metabolized into allopregnanolone and pregnanolone, then they undergo further reduction, conjugation (glucuronidation and/or sulfation) and are excreted by the kidneys into urine
- Alpha metabolites of progesterone can bind to the GABA receptor and may support sleep and relaxation
- Urinary progesterone metabolite levels strongly correlate with serum when progesterone is not being supplemented

Progesterone Summary

- Progesterone is made primarily by the corpus luteum after ovulation and thru menses
- When assessing progesterone, you are most interested in the luteal phase measurement (7 days post ovulation)
- Serum levels >10 ng/mL indicate ovulation has occurred
- Progesterone urine metabolites, shown on the DUTCH test, correlate strongly with serum in females not on supplemented progesterone
- Alpha progesterone metabolites can interact with the GABA receptor and for many women, support sleep and a relaxed mood

Thank You!

If you are interested in learning more about hormones, each week we hold one-hour long mentorship sessions! Once you are a registered DUTCH provider, you can book these through our online scheduling link. Please call to get registered today.

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