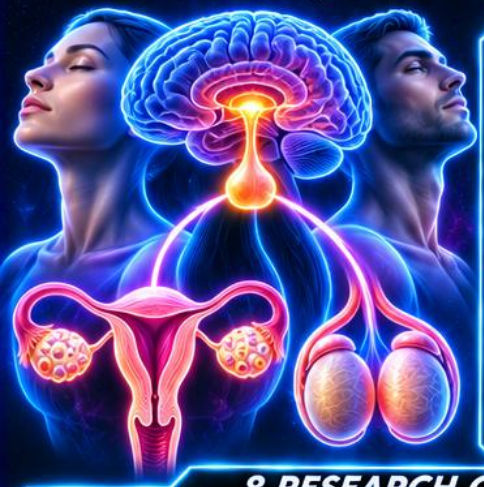
Peptide Perspectives™

THE BIOLOGY OF FERTILITY

How Peptides Help Regulate Reproductive Hormones



THE HPG AXIS (REPRODUCTIVE CONTROL SYSTEM)

Kisspeptin (activates)
→ **GnRH** (pulsatile release)
→ **Pituitary Gland** (releases)
→ **LH** (luteinizing hormone) / **FSH** (follicle-stimulating hormone)

- **Ovaries (Women)**
  - ✓ Follicle growth
  - ✓ Estrogen production
  - ✓ Ovulation (LH surge)
  - ✓ Progesterone (after ovulation)
- **Testes (Men)**
  - ✓ Leydig cells → Testosterone (LH)
  - ✓ Sertoli cells → Sperm production (FSH)

NEGATIVE FEEDBACK
Estrogen, progesterone, and testosterone signal back to the brain and pituitary to regulate GnRH, LH, and FSH levels.

TIMING MATTERS

- ✓ Pulsatile GnRH (physiologic) stimulates LH and FSH and supports fertility.
- ✗ Sustained GnRH agonist exposure eventually suppresses LH and FSH, reducing fertility.

8 RESEARCH COMPOUNDS & EVIDENCE OVERVIEW

KISSPEPTIN-54

- ✓ Activates the KISS1 receptor to increase GnRH release and downstream LH and FSH.
- ✓ Early human studies (e.g., IVF) show LH/FSH increases and potential clinical benefit.
- ✓ Investigational for fertility; distinct from kisspeptin-10.

INVESTIGATIONAL (EARLY CLINICAL DATA)

hCG (Human Chorionic Gonadotropin)

- ✓ Mimics LH to trigger ovulation, support luteal function, and stimulate testosterone in men.
- ✓ Established and widely used in fertility treatments (e.g., IVF, ovulation induction, male factors).
- ⚠ Risk of ovarian hyperstimulation syndrome (OHSS), especially at higher exposure.

FDA-APPROVED (FERTILITY USES)

GONADORELIN (GnRH)

- ✓ A synthetic form of GnRH that stimulates LH and FSH release from the pituitary.
- ✓ Used in fertility care with pulsatile delivery (e.g., infusion pumps) to mimic natural GnRH.
- ✓ Not a casual or self-directed injection; requires specialist protocols and monitoring.

SPECIALIST CARE (FERTILITY PROTOCOLS)

FSH / MENOTROPINS (e.g., FSH, hMG)

- ✓ Directly stimulate follicle growth (ovaries) and sperm production (testes).
- ✓ Established therapy for ovulation induction, IVF, and certain male fertility conditions.
- ✓ Used under specialist supervision with individualized protocols.

FDA-APPROVED (SELECTED INDICATIONS)

GnRH ANTAGONISTS (e.g., Cetrorelix, Ganirelix)

- ✓ Block GnRH receptors to rapidly reduce LH and FSH release.
- ✓ FDA-approved to prevent a premature LH surge during controlled ovarian stimulation (IVF).
- ✓ Commonly used in modern IVF protocols.

FDA-APPROVED (IVF – LH SURGE PREVENTION)

GnRH AGONISTS (e.g., Leuprolide, Triptorelin)

- ✓ Initially stimulate LH/FSH (a "flare") followed by downregulation and suppression with continued use.
- ✓ Used in fertility treatment as a short "trigger" (ovulation) or for longer-term suppression (e.g., endometriosis, fibroids, IVF prep).
- ✓ Different outcomes depend on dose, timing, and treatment goal.

FDA-APPROVED (FERTILITY & HORMONE CONTROL)

RECOMBINANT LH (rLH, e.g., Lutonin Alfa)

- ✓ Provides LH activity to support follicle development and steroid (testosterone/estrogen) production.
- ✓ Used in select fertility cases, often in combination with FSH (e.g., low LH or poor ovarian response).
- ✓ Specialist-directed use; product availability varies by region.

SPECIALIST CARE (SELECTED FERTILITY USES)

MVT-602 (Kisspeptin Analog)

- ✓ A longer-acting KISS1 receptor agonist designed to stimulate GnRH, LH, and FSH.
- ✓ Early human studies show hormone increases (LH/FSH) with a favorable safety profile.
- ✓ Investigational; no proven benefit on pregnancy or live birth to date.

INVESTIGATIONAL (EARLY HUMAN DATA)

WOMEN: THE REPRODUCTIVE CYCLE

Follicle Growth (FSH) → Egg Maturation (Estrogen) → Ovulation (LH Surge) → Implantation (Progesterone)

MEN: HORMONES & SPERM PRODUCTION

- **LH → Leydig Cells → Testosterone** (supports sperm development, libido, and reproductive function)
- **FSH → Sertoli Cells → Sperm Production** (sperm maturation and quality)

- ✓ Both LH and FSH are important for fertility.
- ✗ High testosterone alone does not prove fertility.
- ✗ Exogenous testosterone can suppress LH/FSH and reduce or stop sperm production.

WHAT GOOD STUDIES SHOULD MEASURE

- ✓ Ovulation (egg release)
- ✓ Mature egg count (e.g., at retrieval)
- ✓ Sperm parameters (count, motility, morphology)
- ✓ Pregnancy (clinical, verified)
- ✓ **LIVE BIRTH** (the most important outcome)
- ✓ OHSS (safety/tolerability)
- ✓ Overall safety and side effects

WHERE SCIENCE IS HEADING

- ✓ More precise and controllable triggers (e.g., next-generation kisspeptin analogs).
- ✓ Individualized, biomarker-driven protocols (e.g., AMH, ovarian reserve, male factors).
- ✓ Safer, more effective fertility treatment options (with lower risk of OHSS and better outcomes).
- ✓ Better matching of therapy to the right diagnosis (e.g., ovulatory dysfunction, low LH/FSH, male factors).

⚠ A HORMONE RISE, A MATURE EGG, A PREGNANCY AND A LIVE BIRTH ARE DIFFERENT OUTCOMES. NO EXPERIMENTAL PEPTIDE GUARANTEES FERTILITY.

Educational research overview | November 2026 | Not medical advice