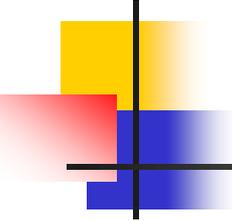


# THE GONADOTROPINS

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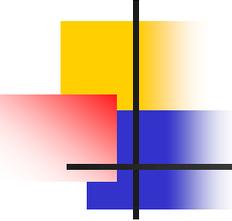
- FSH
- LH
- human Chorionic Gonadotropin (hCG)
- Are dimers that share
  - an identical  $\alpha$  chain
  - in addition to a distinct  $\beta$  chain

# Chemistry & Pharmacokinetics



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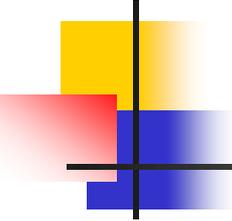
- MENOTROPINS
- FOLLICLE-STIMULATING HORMONE
  - **Urofollitropin,**
  - **follitropin alfa** and **follitropin beta**
- LUTEINIZING HORMONE
  - **Lutropin,**
- HUMAN CHORIONIC GONADOTROPIN



# Pharmacodynamics

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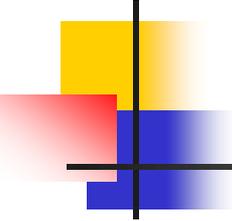
- Effects through G protein-coupled receptors



# Clinical Pharmacology

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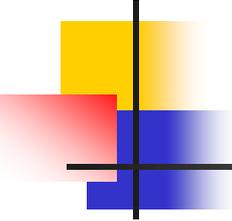
- OVULATION INDUCTION
  - to induce ovulation in women with anovulation due to:
    - hypogonadotropic hypogonadism
    - polycystic ovary syndrome
    - obesity
- MALE INFERTILITY



# Toxicity & Contraindications

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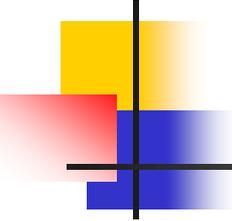
- **ovarian hyperstimulation syndrome**
- **multiple pregnancies**
- Headache, depression, edema, precocious puberty



# GONADOTROPIN-RELEASING HORMONE & ITS ANALOGS

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- *Pulsatile* GnRH secretion is required to stimulate the gonadotroph cell to produce and release LH and FSH
- Sustained, *nonpulsatile* administration of GnRH or GnRH analogs *inhibits* the release of FSH and LH by the pituitary



# Chemistry & Pharmacokinetics

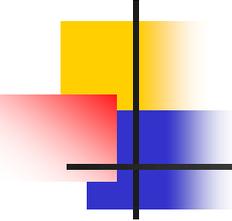
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## ■ STRUCTURE

- GnRH is a decapeptide found in all mammals
- **Gonadorelin** is an acetate salt of synthetic human GnRH
- Synthetic analogs include **goserelin, histrelin, leuprolide, nafarelin, and triptorelin.**

## ■ PHARMACOKINETICS

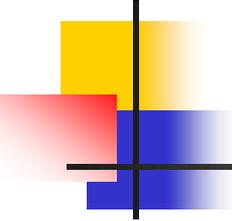
- GnRH analogs can be administered subcutaneously, intramuscularly, via nasal spray or as a subcutaneous implant



# Pharmacodynamics

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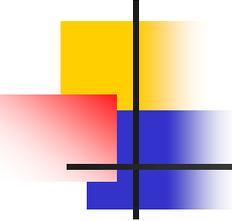
- GnRH exhibit complex dose-response relationships that change dramatically from the fetal period through the end of puberty.



# Clinical Pharmacology

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- STIMULATION
  - Female infertility
  - Male infertility
  - Diagnosis of LH responsiveness
- SUPPRESSION
  - Controlled ovarian hyperstimulation
  - Endometriosis
  - Uterine leiomyomata (uterine fibroids)
  - Prostate cancer
  - Central precocious puberty
  - Other
    - advanced breast and ovarian cancer

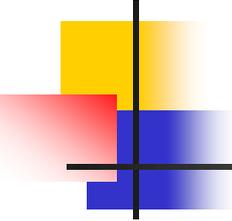


# Toxicity

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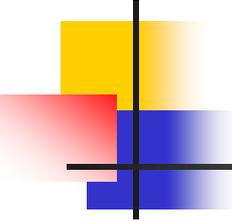
- Headache, light-headedness, nausea, and flushing
- Contraindications to the use of GnRH agonists in women include
  - pregnancy and breast-feeding

# GNRH RECEPTOR ANTAGONISTS



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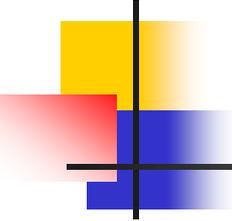
- **Ganirelix and cetrorelix**
  - Pharmacokinetics
    - absorbed rapidly after subcutaneous injection
  - Clinical Pharmacology
    - preventing the LH surge during controlled ovarian hyperstimulation
  - Toxicity
    - nausea and headache



# PROLACTIN

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- Is a 198-amino-acid peptide hormone
- Its structure resembles that of GH



# DOPAMINE AGONISTS

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- **Bromocriptine , cabergoline, pergolid and Quinagolide**
- **Pharmacokinetics**
  - All available dopamine agonists are active as oral preparations
- **Clinical Pharmacology**
  - HYPERPROLACTINEMIA
  - PHYSIOLOGIC LACTATION
  - ACROMEGALY
- **Toxicity & Contraindications**
  - nausea, headache, light-headedness, orthostatic hypotension, and fatigue