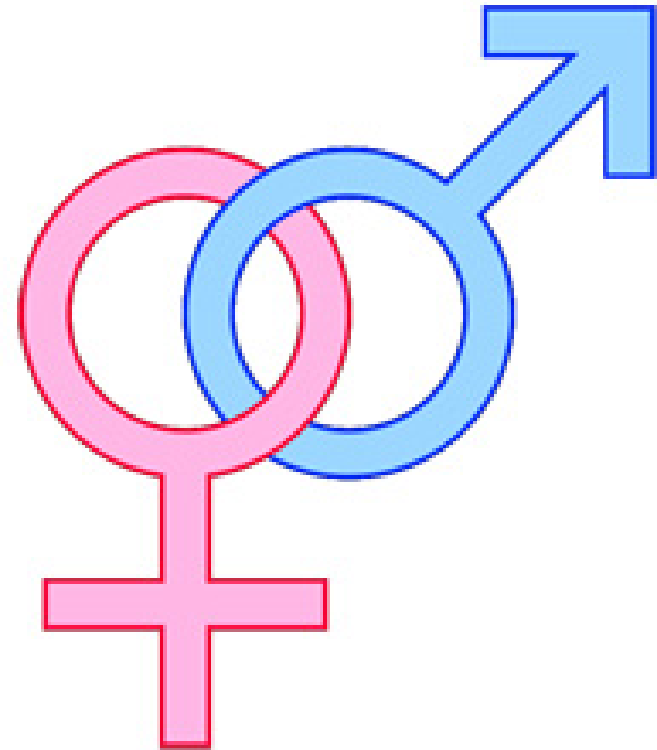


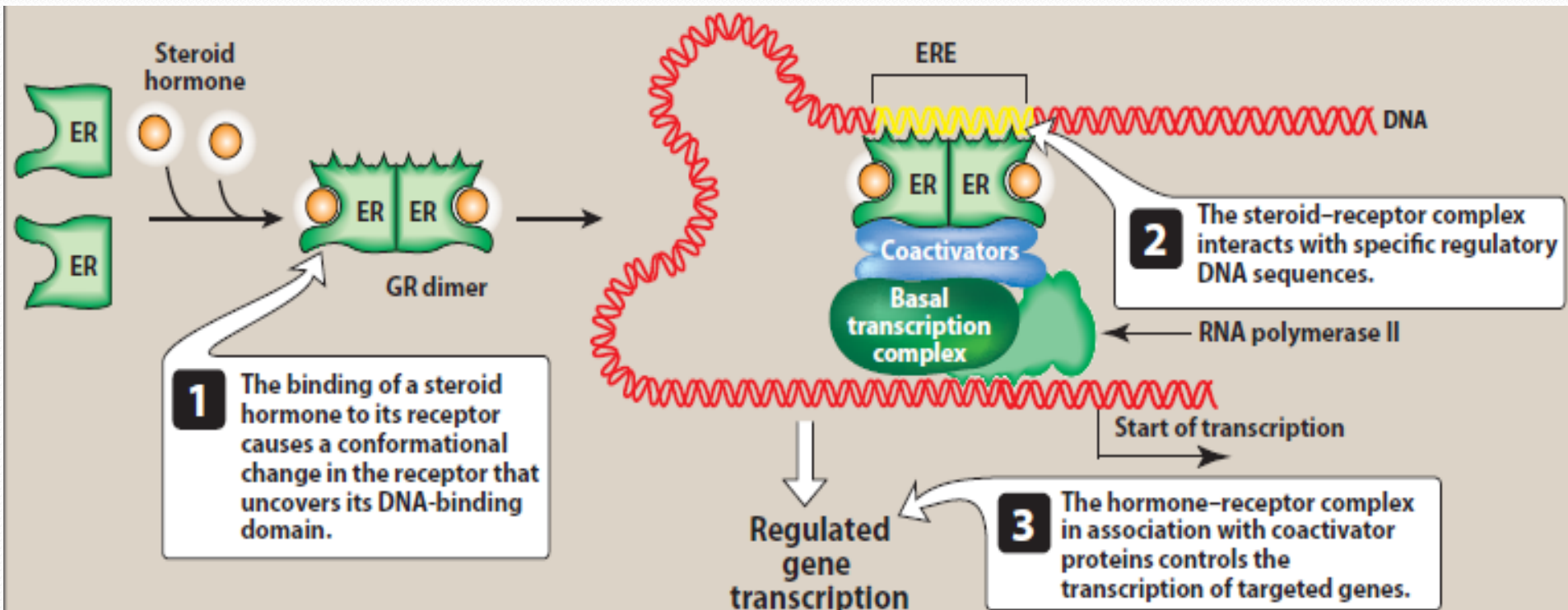
Gonadal Hormones

By
Ahmed Shubbar



Estrogens

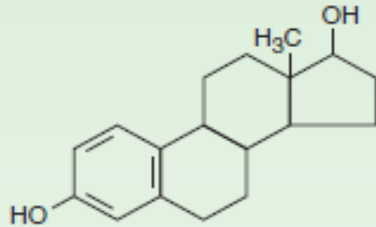




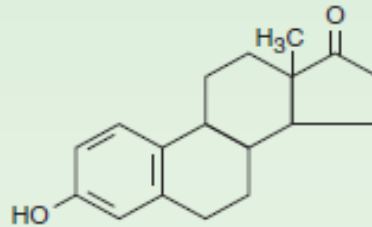
Therapeutic Uses

- Hypogonadism / premature ovarian failure.
- Postmenopausal hormone therapy (vasomotor symptoms such as hot flushes, vaginal atrophy and osteoporosis, therapy usually instituted with a progestogen to reduce the risk of endometrial CA.
- Contraception.

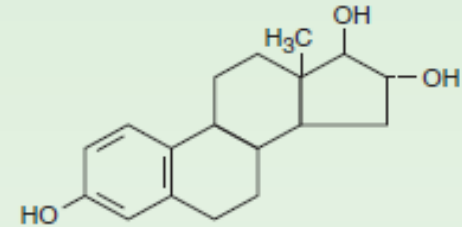
**Steroidal,
natural**



Estradiol

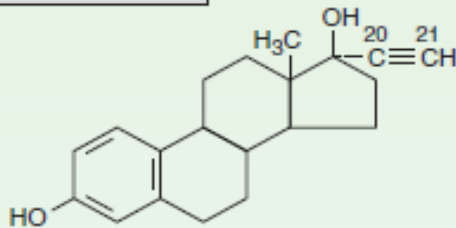


Estrone

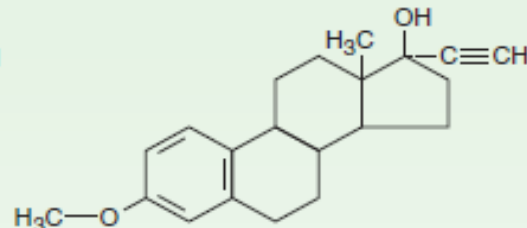


Estriol

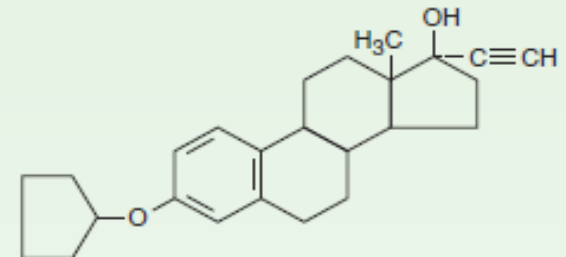
**Steroidal,
synthetic**



Ethinyl estradiol

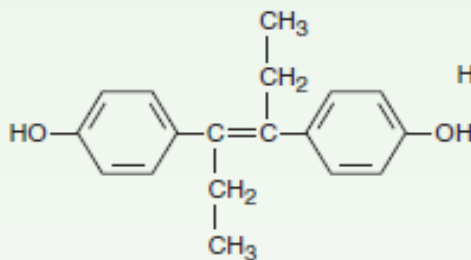


Mestranol

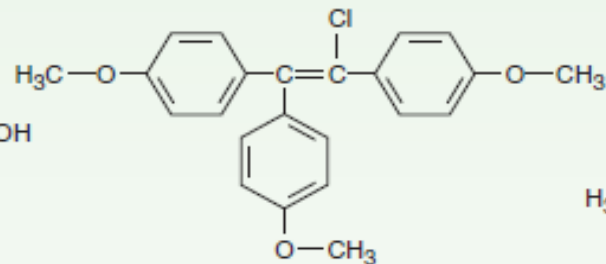


Quinestrol

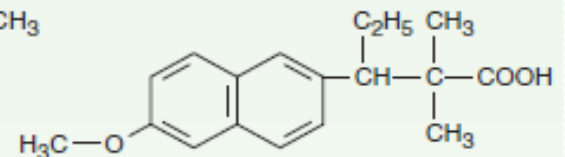
**Nonsteroidal,
synthetic**



Diethylstilbestrol



Chlorotrianisene



Methallenestrol



ESTROGEN DOMINANCE

Adverse effects

Breast tenderness



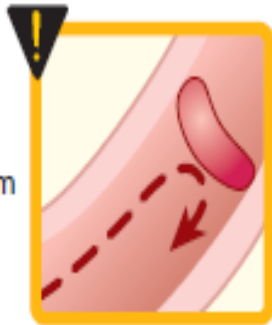
Nausea



Hypertension



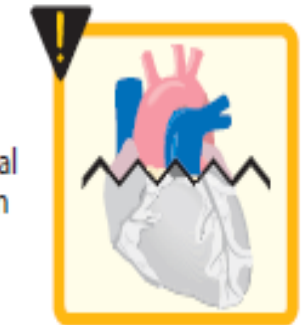
Thromboembolism



Peripheral edema

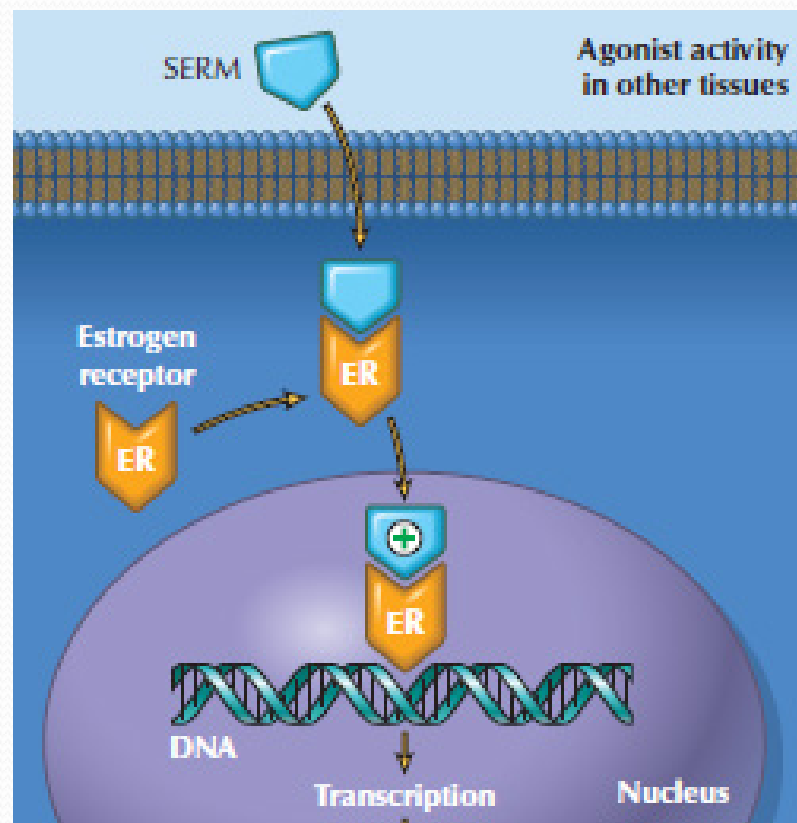
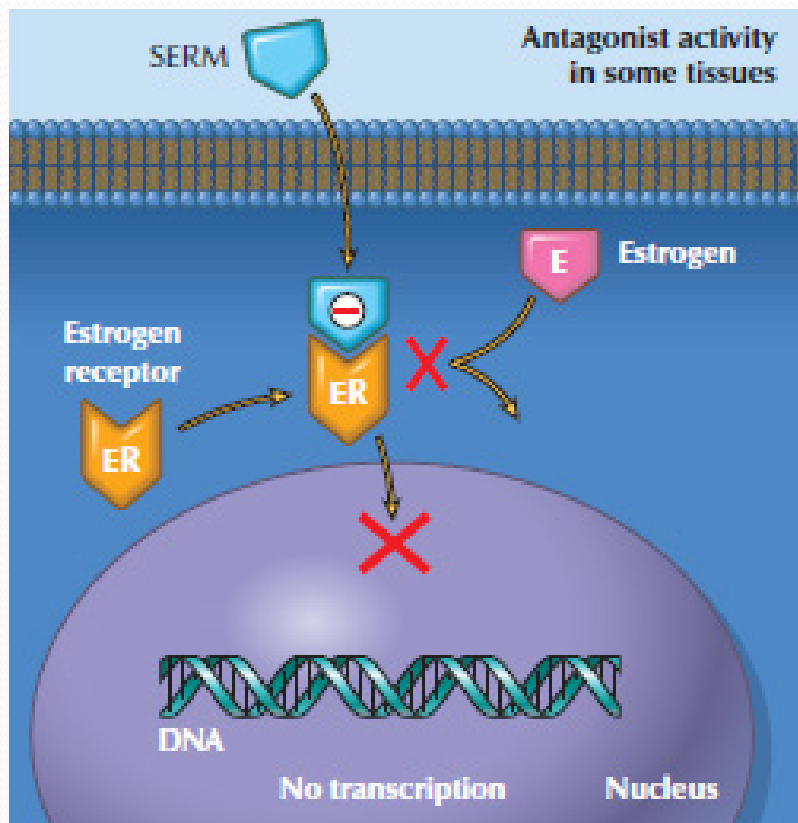


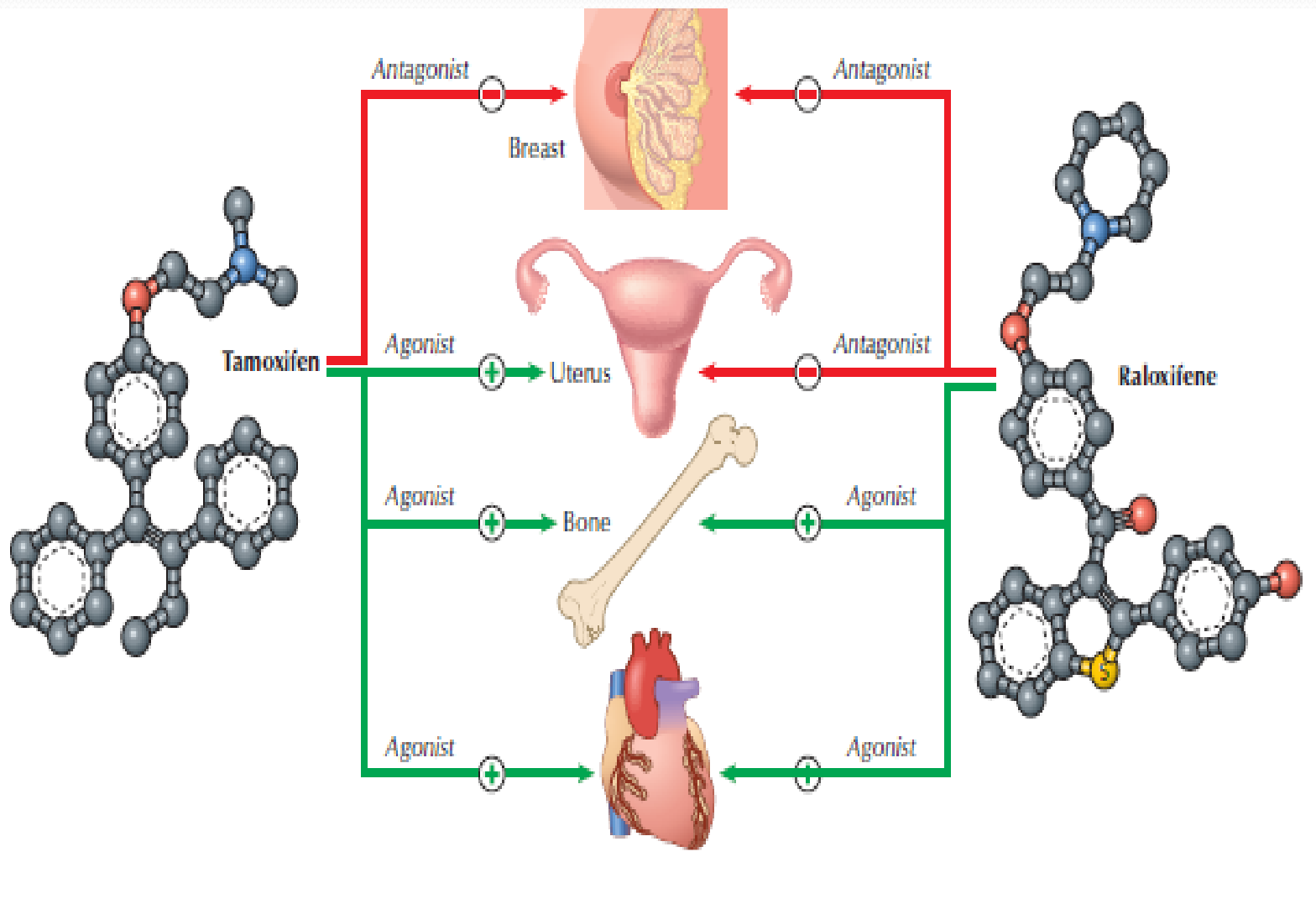
Myocardial infarction

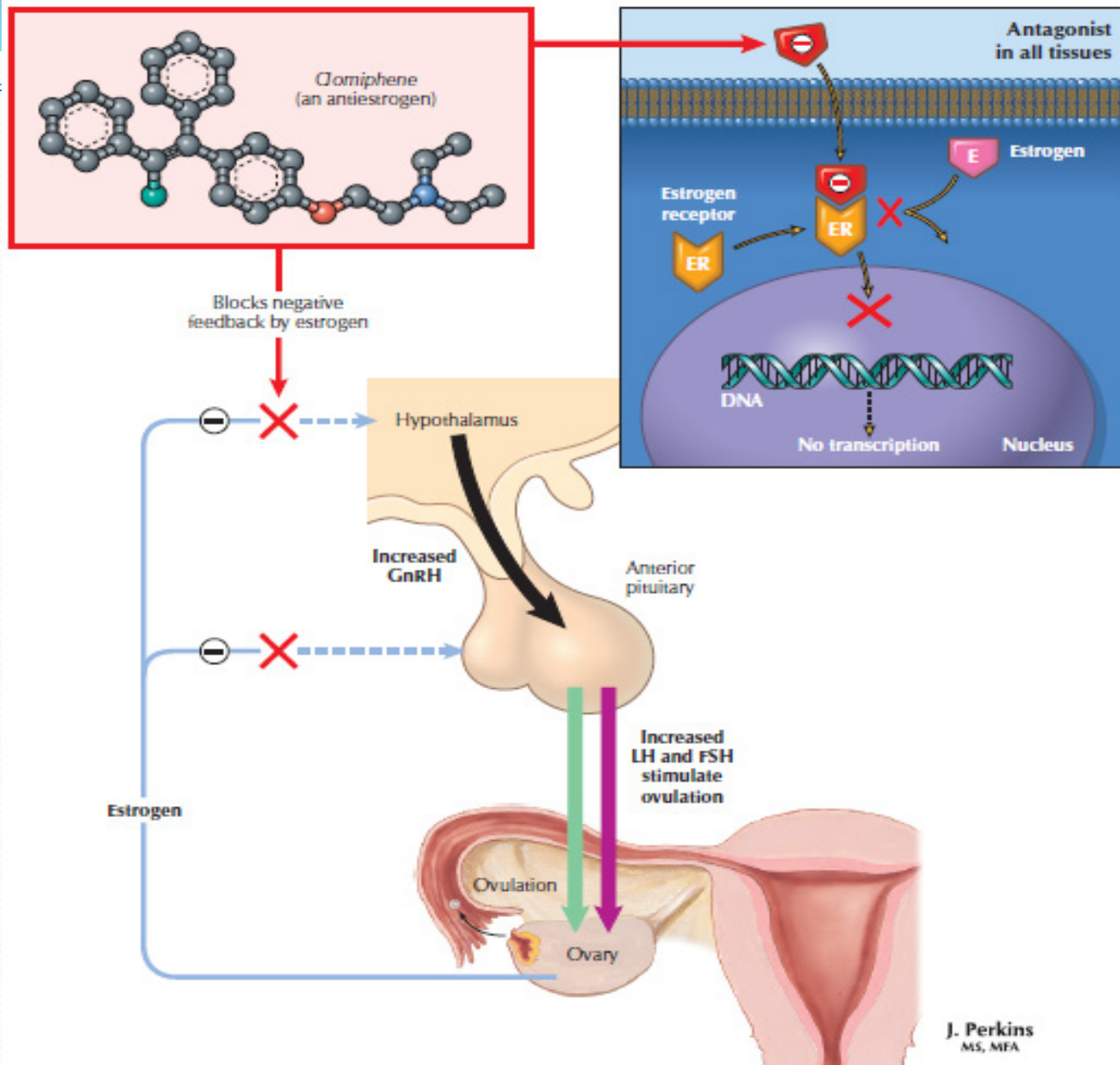


Selective Estrogen Receptor Modulators (SERMs)

- *Tamoxifene, Clomiphene, Raloxifene, Toremifene and Ospemifene.*
- They display selective agonism or antagonism for estrogen receptors depending on the tissue type.







Therapeutic Uses of SERMs

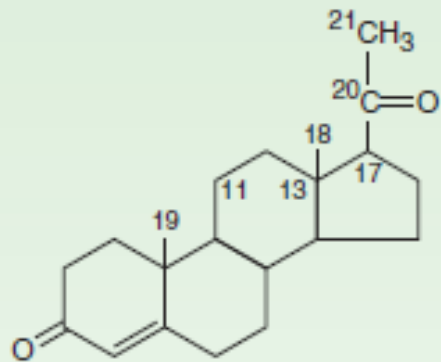
SERM	Indications
<i>Tamoxifene, Toremifene</i>	Breast CA , Female/Male infertility
<i>Clomiphene</i>	Female/Male infertility
<i>Raloxifene</i>	Prevention and treatment of Osteoporosis, Breast CA
<i>Ospemifene</i>	Dyspareunia

Adverse effects

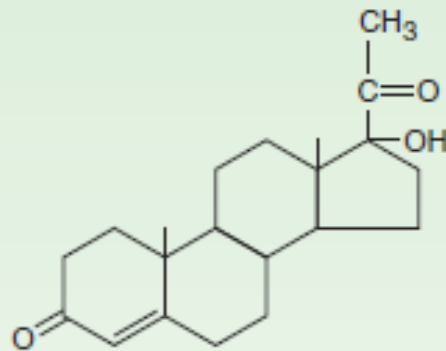
- Nausea and hot flushes.
- Endometrial hyperplasia and malignancies (tamoxifene).
- Increase risk of DVT, PE and retinal vein thrombosis (avoid in women with past Hx of vein thrombosis).
- Multiple births (clomiphene).



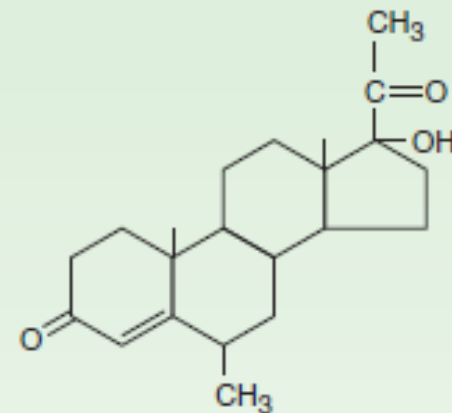
Progestogens



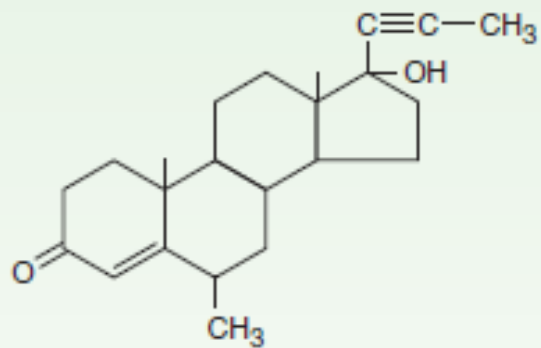
Progesterone



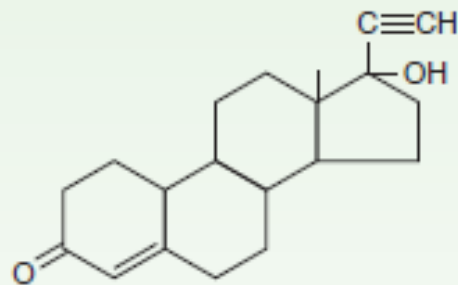
Hydroxyprogesterone



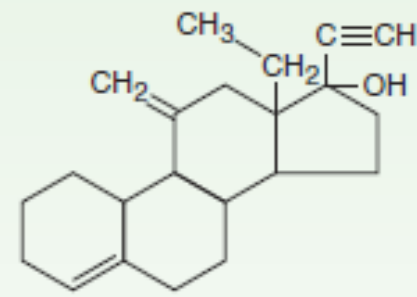
Medroxyprogesterone



Dimethisterone



Norethindrone



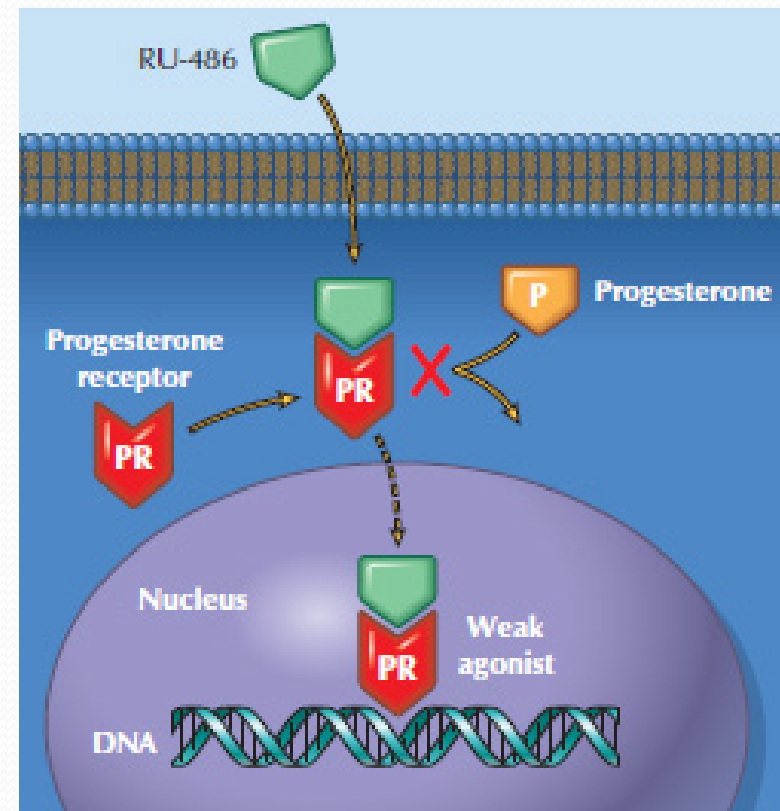
Desogestrel

- Progestogens exert their mechanism of action in a manner analogous to that of the other steroids.
- **Indications:** Hormone replacement, contraception, dysfunctional uterine bleeding, dysmenorrhea and management of endometriosis and infertility.
- **Adverse effects:** headache, depression, weight gain and changes in libido.

- Norethindrone, norgestrel and levonorgestrel possess some androgenic activity because of their structural similarity to *testosterone* and can cause acne and hirsutism.
- Less androgenic progestins, such as *norgestimate* and *drospirenone*, may be preferred in women with acne.
- *Drospirenone* may raise serum potassium due to antimineralocorticoid effects.

Mifepristone (RU486)

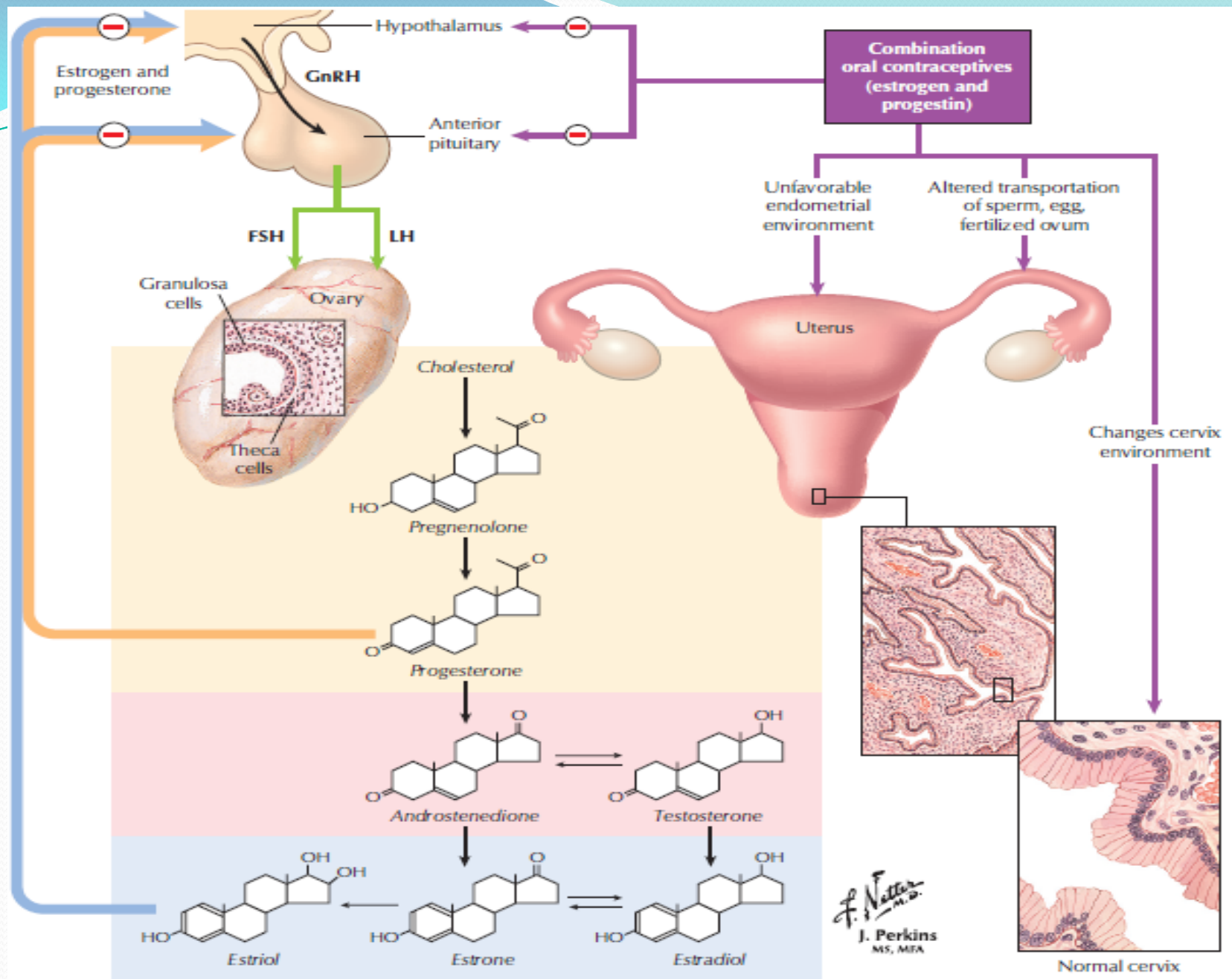
- is a progesterone receptor antagonist used as *abortifacient*.





Contraceptives

1. Combined oral contraceptives.
2. Transdermal patch / vaginal ring.
3. Progestin-only pills.
4. Injectable progestin.
5. Progestin implants.
6. Progestin IUD.
7. Copper IUD.
8. Spermicides.
9. Diaphragm/ Condom.
10. Postcoital contraception.



Contraindications of OCC

- The presence of cerebrovascular and thromboembolic disease.
 - Estrogen-dependent neoplasms
 - Liver disease.
 - In patients over the age of 35 who are heavy smokers.
-
- *They should be avoided or used with caution in patients migraine, diabetes and hypertension.*

Androgens

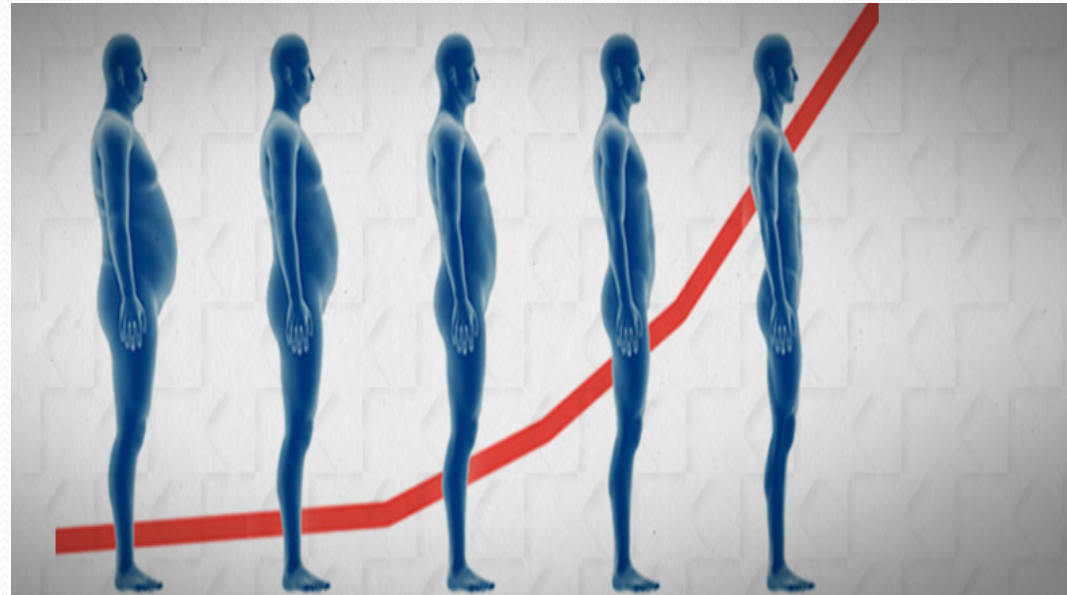


Drug	Androgenic Anabolic Activity
Testosterone	1:1
Testosterone cypionate	1:1
Testosterone enanthate	1:1
Methyltestosterone	1:1
Fluoxymesterone	1:2
Oxymetholone	1:3
Oxandrolone	1:3–1:13
Nandrolone decanoate	1:2.5–1:4

- Like the estrogens and progestins, androgens bind to a specific nuclear receptor in a target cell.
- Although *testosterone* itself is the active ligand in muscle and liver, in other tissues it must be metabolized to derivatives, such as 5 α -dihydrotestosterone (DHT) via the action of 5 α -reductase.

Therapeutic Uses

- Hypogonadism.
- Anabolic steroids can be used to treat chronic wasting associated with HIV or cancer.



Danazol

- is a weak androgen used in the treatment of endometriosis and fibrocystic breast disease.
- **Adverse effects:** Weight gain, acne, decreased breast size, deepening voice, increased libido, and increased hair growth are among the adverse effects.

Adverse effects

- **Females:** masculinization, acne, growth of facial hair, deepening of the voice, male pattern baldness, and excessive muscle development.
- **Males:** priapism, impotence, decreased spermatogenesis, and gynecomastia.
- **General effects:** hepatotoxicity (oral route), increase serum LDL and lower serum HDL and fluid retention.

Antiandrogens

- *Flutamide, bicalutamide, enzalutamide and nilutamide* act as competitive inhibitors of androgens at the target cell and are effective orally for the treatment of prostate cancer.
- *Finasteride and dutasteride* inhibit 5α -reductase resulting in decreased formation of DHT. These agents are used for the treatment of BPH and male pattern baldness.



Thank you

References

-Lippincott's Illustrated Reviews: Pharmacology ,
6th edition .

-Basic & Clinical Pharmacology , Bertram G. Katzung
12th edition .