Gonadal Steroidogenic Pathway

**Cholesterol**

1. LDL (mostly)
2. HDL from dietary sources, and/or
3. de novo fatty-acid synthesis via acetyl CoA (normal adrenal synthesis w/o LDL receptor, e.g. in familial hypercholesterolemia)

Stimulated by LH in theca cells

- P450scc

**Pregnenolone**

- 3β-HSD
- 17α-20α-lyase

Stimulated by LH in theca cells

- StAR-mediated uptake of cholesterol

StAR expression is stimulated by LH binding its receptor in Leydig cells (testes) and theca cells (ovaries)

**Aldosterone**

- Natural Process: In states of stress, the body shunts pregnenolone down the pathway to become cortisol.

- Pregnenolone Steal / Cortisol Steal: When chronic stress persists, resources are continuously pulled away from the pathways that produce the hormones testosterone, estrogen, and aldosterone.

**Pathophysiological Pathways of EDCs**

- Biophenol A, Dioxin, PCBs, Phthalates, Estrogens, Pesticides, Organochlorine pesticides
- Heavy metals, Pesticides, Ethanol, PCBs, Organochlorine pesticides
- Air pollution, Biophenol A, PCBs

EDC

TARGETED APPARATUS/ORGANS

DISEASE

- Reproductive/Endocrine
- Brain/Nervous
- Pulmonary/Cardiovascular

- Cancer, Infertility, Obesity, Diabetes, Metabolic syndrome, Reproductive harm
- Alzheimer, Parkinsonism, Learning disabilities, Reduced IQ
- Asthma, Heart disease, Hypertension, Stroke

**Occurs in Gonads**

- Estradiol
- Testosterone to Estrogen Conversion

- Aromatase Activity

Conversion of androgens (theca cells) into estrogens (granulosa cells) of the ovary, is carried out by aromatase.

Aromatase and 17β-HSD are also found in peripheral tissues such as skin, breast, brain and blood vessels.

In males, most aromatase activity occurs in adipose tissue.

A hormone imbalance in men can lead to Gynecomastia.

**Gynecomastia**

is an enlargement or swelling of breast tissue in males.

It is most commonly caused by male estrogen levels that are too high, or are out of balance with testosterone levels.

**Hormone Synthesis & Cortisol Steal**

- 11β-Hydroxylase
- 21-Hydroxylase
- 17α-Hydroxylase
- 5α-reductase

**Occurs in Adrenal Glands**

- DHEA-S
- SULT2A1

Stimulates

- 1. Stimulates androgen secretion;
- 2. serum levels reflect DHEA levels if SULT2A1 is active;
- 3. occurs in zona reticularis

**Pathophysiological Pathways of EDCs**

reference: www.pathophys.org/sexhormones

biospecnutritionals.com