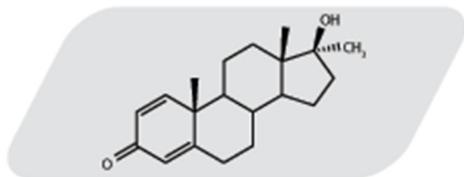


Steroid Drug Information

Classification



A steroid is a terpenoid lipid characterized by a carbon skeleton with four fused rings, generally arranged in a 6-6-6-5 fashion. Steroids vary by the functional groups attached to these rings and the oxidation state of the rings. Hundreds of distinct steroids are found in plants, animals, and fungi. Many more have been produced as synthetic drugs. Three steroid classes found in human body belong to a subset of the sex hormones that produce sex differences and control reproduction. They include androgens, estrogens, and progestagens.

- **Androgens (androgenic-anabolic steroids)** are a class of steroids responsible for the development and maintenance of male sexual characteristics. Androgens interact with androgen receptors to increase muscle and bone synthesis exhibiting their anabolic performance enhancing effect. There are natural and synthetic anabolic steroids available. **Testosterone is a principal androgenic-anabolic steroid in the body. In popular language the word 'steroids' usually refers to anabolic steroids.**
- Estrogens are involved in female reproductive function.
- Progestagens serve as protectors of pregnancy.
- Corticosteroids include glucocorticoids and mineralocorticoids. Glucocorticoids regulate many aspects of metabolism and immune function, whereas mineralocorticoids help maintain blood volume and control renal excretion of electrolytes.
- Cholesterol is a major source for the synthesis all other steroid hormones in the body.

Metabolism

In the body testosterone and its synthetic analogs are bio-transformed into more polar compounds, metabolites. Enzymatically catalyzed reduction, oxidation, hydroxylation and isomerization are the major metabolic reactions. Consequent conjugation with glucuronic acid or sulfate facilitates ultimate elimination of steroid metabolites from the body with urine.

Abuse

Androgenic-anabolic steroids (AAS) have limited medical use, but are abused as performance enhancing drugs in sports and more recently in some professional areas, where strong muscular appearance is important. In the general population, especially among adolescents and young adults, AAS are abused as a cosmetic tool helping to improve physique.

AAS have been classified as Schedule III Controlled Substances in the United States since 1991. Side effects include suppression of endogenous hormone production, gynecomastia (female type

breast growth in males), acne, liver toxicity, mood swings, aggression, infertility and masculinization in females: deepening of the voice and male type hair growth.

T/E ratio

Testosterone and its precursors may be endogenous (produced in the body naturally) or exogenous (ingested as drugs or supplements). The T/E ratio is used to distinguish between the two. This ratio is a urine concentration ratio of two steroids, testosterone (T) and its natural isomer, epitestosterone (E). The normal average ratio is approximately 1, with individual variation on both sides, either higher or lower.

Ingestion of exogenous testosterone or its precursors suppresses internal steroid production in the body. Both endogenous T and E would be suppressed. However, total testosterone concentration in urine will rise above normal due to ingested drug. Low E and high T cause the T/E ratio to rise above 6 (cut-off), indicating testosterone abuse.

Laboratory drug testing: Methods of Analysis

RTL utilizes the most sophisticated, sensitive, and specific equipment and technology available. RTL performs a fast, efficient and sensitive GC/MS steroid screen, capable of detecting 85 endogenous and exogenous compounds providing information about naturally occurring and synthetic steroids and metabolites. The RTL Steroid Test includes specific GC/MS confirmation methods for each individual drug.

Accurate quantification is performed for nandrolone and testosterone with cut-off levels of 2 ng/mL (nandrolone metabolite) and testosterone to epitestosterone ratio above 6 ($T/E > 6$).