Commentary

# Steroid Hormones and Mechanism of Steroid Resistance

**Sara Nasrat***

*Biomedical Engineering Department, Khalifa University, Abu Dhabi, Saudi Arabia.*

***Received date:*** *29 March, 2023, Manuscript No. JBCRS-23-99238;* ***Editor assigned date:*** *31 March, 2023, PreQC No. JBCRS-23-99238(PQ);* ***Reviewed date:*** *14 April, 2023, QC No. JBCRS-23-99238;* ***Revised date:*** *21 April, 2023, Manuscript No. JBCRS-23-99238(R);* ***Published date:*** *28 April, 2023, DOI: 10.36648/ 2278-960X.12.2.031*

## DESCRIPTION

Steroid hormones play crucial roles in various physiological processes, including development, reproduction, metabolism, and homeostasis. Their levels are tightly regulated in the body, and any imbalance can lead to significant health issues. This manuscript provides a comprehensive overview of steroid hormone levels, including their synthesis, regulation, and functions. Additionally, it discusses the clinical implications of altered steroid hormone levels and explores potential therapeutic interventions. Understanding the intricate mechanisms governing steroid hormone levels is essential for advancing medical research and improving patient care.

Steroid hormones are a class of lipids derived from cholesterol that serve as key signaling molecules in the endocrine system [1]. They are produced in various organs, including the adrenal glands, ovaries, testes, and placenta, and exert their effects by binding to specific receptors in target tissues. Steroid hormones can be broadly classified into five major groups: glucocorticoids, mineralocorticoids, androgens, estrogens, and progestogens [2].

The synthesis of steroid hormones begins with the conversion of cholesterol into pregnenolone, a precursor molecule, through a series of enzymatic reactions [3]. Subsequently, pregnenolone serves as the starting point for the synthesis of specific steroid hormones, depending on the tissue and the presence of specific enzymes [4]. The regulation of steroid hormone synthesis involves a complex interplay of various factors, including hypothalamic-pituitary signaling, enzyme activity, and feedback mechanisms. Hormonal imbalances, genetic mutations, and environmental factors can disrupt this delicate regulatory system, leading to abnormal steroid hormone levels [5].

Steroid hormones play critical roles in numerous physiological processes. Glucocorticoids, such as cortisol, regulate metabolism, immune responses, and stress responses. Mineralocorticoids, such as aldosterone, maintain electrolyte balance and blood pressure [6]. Androgens, including testosterone, are involved in the development and maintenance of male secondary sexual characteristics. Estrogens, primarily estradiol, regulate female reproductive processes and contribute to bone health. Progestogens, such as progesterone, prepare the uterus for implantation and support pregnancy. These diverse functions highlight the importance of maintaining appropriate steroid hormone levels for overall health and well-being. Abnormal steroid hormone levels can have profound clinical implications. For instance, excess glucocorticoid production leads to Cushing's syndrome, characterized by weight gain, hypertension, and muscle weakness [7]. Insufficient glucocorticoid levels result in adrenal insufficiency, causing fatigue, weight loss, and low blood pressure. Imbalances in sex steroid hormones contribute to conditions like polycystic ovary syndrome (PCOS) and hypogonadism, affecting fertility and sexual development. Additionally, altered estrogen levels are associated with menopausal symptoms and increased risk of osteoporosis. Accurate measurement and monitoring of steroid hormone levels are crucial for diagnosing and managing these conditions effectively [8].

Understanding the regulation of steroid hormone levels has facilitated the development of therapeutic interventions. Hormone Replacement Therapy (HRT) is commonly used to address hormone deficiencies, particularly in menopause and adrenal insufficiency [9]. Conversely, drugs that inhibit steroidogenesis, such as inhibitors of 5-alpha-reductase or aromatase, are utilized in the treatment of hormone-dependent conditions like prostate cancer or breast cancer. Advanced techniques, including mass spectrometry and immunoassays, enable precise measurement of steroid hormone levels, aiding in diagnosis and treatment monitoring [10].

## REFERENCES

1. Soldin OP, Makambi KH, Soldin SJ et al. Steroid hormone levels associated with passive and active smoking. Steroids (2011) 76(7): 653-9.
2. Gates MA, Mekary RA, Chiu GR et al. Sex steroid hormone levels and body composition in men. J Clin Endocrinol Metab (2013) 98(6): 2442-50.
3. Peck JD, Hulka BS, Poole C et al. Steroid hormone levels during pregnancy and incidence of maternal breast cancer. Cancer Epidemiol Biomarkers Prev (2002) 11(4):3618.
4. Hankinson SE, Willett WC, Manson JE et al. Plasma sex steroid hormone levels and risk of breast cancer in postmenopausal women. JNCI: J Natl Cancer Inst (1998) 90(17):1292-9.

**Corresponding Author:**

Sara Nasrat, Biomedical Engineering Department, Khalifa University, Abu Dhabi, Saudi Arabia; E-mail: sara1465@edu.in

**DOI:**

10.36648/ 2278-960X.12.2.031

5. Brann DW, Hendry LB, Mahesh VB Emerging diversities in the mechanism of action of steroid hormones. J Steroid Biochem Mol Biol (1995) 52(2): 113-33.
6. Stanczyk FZ, Lee JS, Santen RJ Standardization of steroid hormone assays: why, how, and when? (2007) 16(9): 1713-9.
7. Maguire J, Mody I Steroid hormone fluctuations and GABAAR plasticity. Psychoneuroendocrinology. (2009) 34:S84-90.
8. Noyola-Martínez N, Halhali A, Barrera D Steroid hormones and pregnancy. Gynecological Endocrinology (2019) 35(5): 376-84.
9. Helzlsouer KJ, Alberg AJ, Gordon GB et al. Serum gonadotropins and steroid hormones and the development of ovarian cancer. JAMA (1995) 274(24): 1926-30.
10. Hartmann S, Lacorn M, Steinhart H Natural occurrence of steroid hormones in food. Food chemistry (1998) 62(1): 7-20.