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# **BIOACTIVE GONADOTROPHIN HORMONES**

*Essay Submitted for Partial Fulfilment  
Of Master Degree in  
Clinical and Chemical Pathology*



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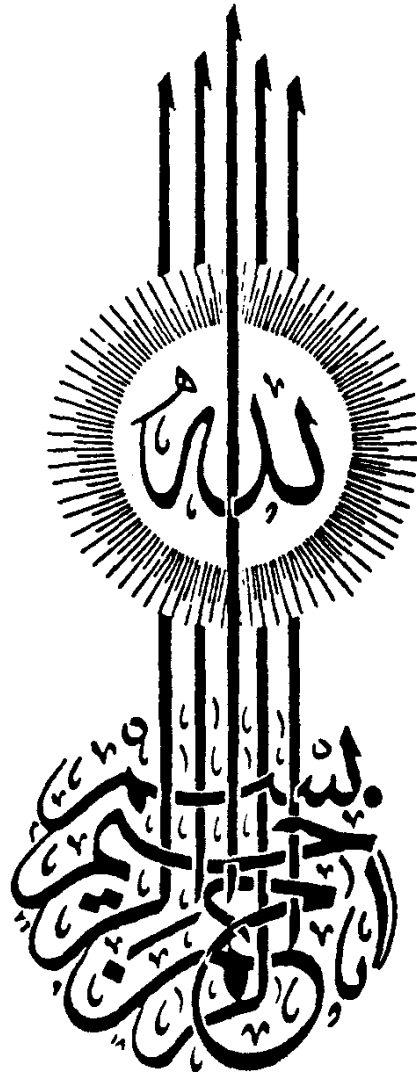
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## LIST OF ABBREVIATIONS

B-	: Bioactive
BSA	: Bovin Serum Albumin
DES	: Diethylstiblerol
DEME	: Dupleccoc's Modified Eagle's medium
E <sub>2</sub>	: Estrogen
ED <sub>50</sub>	: Estradiol
FSH	: Follicular stimulating hormone
GAB	: Granulosa cell aromatase bioassay
GnRH	: Gonadotrophin releasing hormone
HCG	: Human chronic gonadotrophins
HHG	: Human hypophyseal gonadotrophins
HMG	: Human menopausal gonadotrophins
I-	: Immuno
IHH	: Idiopathic hypogonadotrophic hypogonadism
LH	: Luteinizing hormone
LPD	: Luteal phase defect
LRH	: Lutenizing hormone releasing hormone
MEM	: Modified Eagle's medium
MIX	: Methylisobutyl xanthine
P	: Progesterone

PBS	: Phosphate buffer saline
PCO	: Polycystic ovarian syndrome
PEG	: Polyethylene glycol
PM	: Post menopausal
PMSG	: Pregnant mare serum gonadotrophins
RIA	: Radioimmunoassay
RICT	: Rat interstitial cell testosterone
T	: Testosterone.

[illegible]

# INTRODUCTION

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## INTRODUCTION

Bioactive hormones are those measured by bioassay methods (*Lorain and Bell, 1976*). Initially in vivo bioassays were the only methods available and in which the whole animal was used. Examples of such assays are rat ovarian weight and rat ventral prostate response as well as the mouse uterine weight response, (*Van Damme et al., 1974*).

With the advent of tissue cultures in vitro bioassays have been introduced in which a target organ or tissue is used. These bioassays include granulosa cell aromatase bioassay and rat Sertoli cell bioassay used for measurement of follicular stimulating hormone bioactivity, (*Jia et al., 1986*) and rat or mouse Leydig cell and rat or mouse interstitial cell testosterone response used for measurement of luteinizing hormone bioactivity, (*Jakkala et al., 1990*).

Major discrepancies have been observed between the bioactive levels of gonadotrophin hormones as measured by bioassays, and immunoreactive levels, as measured by immunoassays, in a number of physiological and pathological conditions. Thus, it is not the concentration but also the quality and biological potency of the circulating hormone, i.e. bioactivity, that are the major determinants of hormonal action, (*Hutitaniemi et al., 1992*). Furthermore, many studies have shown that the ratio of bioactive to immunoreactive (B:I)

gonadotrophins in serum varies under various clinical conditions,  
(*Jakkola et al., 1990*).

# CHAPTER I

# Chapter ONE

## METHODS OF GONADOTROPHINS

### BIOASSAY

Hormone assays have been subdivided into bioassays, immunoassays and chemical assays. Bioassay of hormones depends upon their biological effects. In this respect, their measurement depends on measurement of the activity they display in an appropriate biological assay system. This assay involves the preliminary isolation of the fundamental element of the biological preparation which is responsible for the biological response and in which the physiological specificity of the hormone is vested. Thus for improved assay specificity and sensitivity, biological assay systems have progressed from the use of whole animal, in vivo assay to the use of isolated target organs, target tissue slices, or target cells, in vitro assay, (Loraine and Bell, 1976).

Accordingly bioassay techniques are classified into:

#### I- In Vivo Bioassay Techniques:

Such techniques by definition involve the use of intact, or substantially intact, live animals. It characteristically involves observation of the changes in a target organ, or the release, in blood