BIOACTIVE GONADOTROPHIN HORMONES

Essay Submitted for Partial Fulfilment

Of Master Degree in

Clinical and Chemical Pathology

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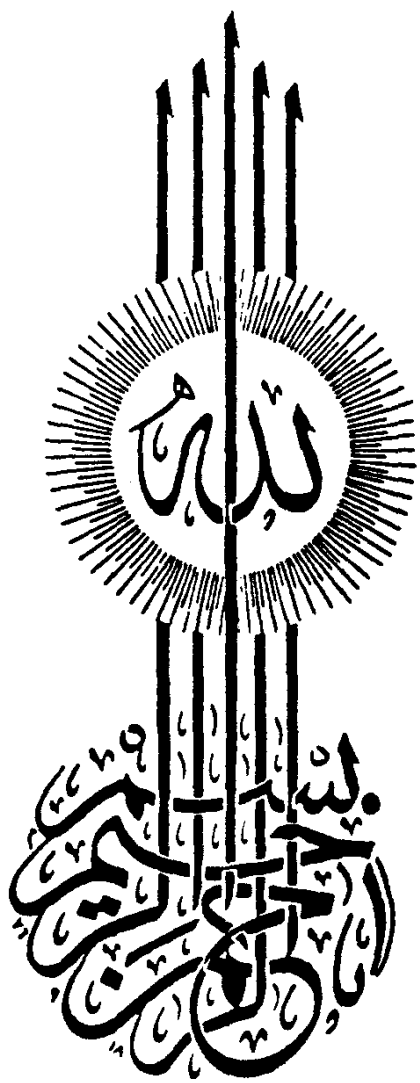

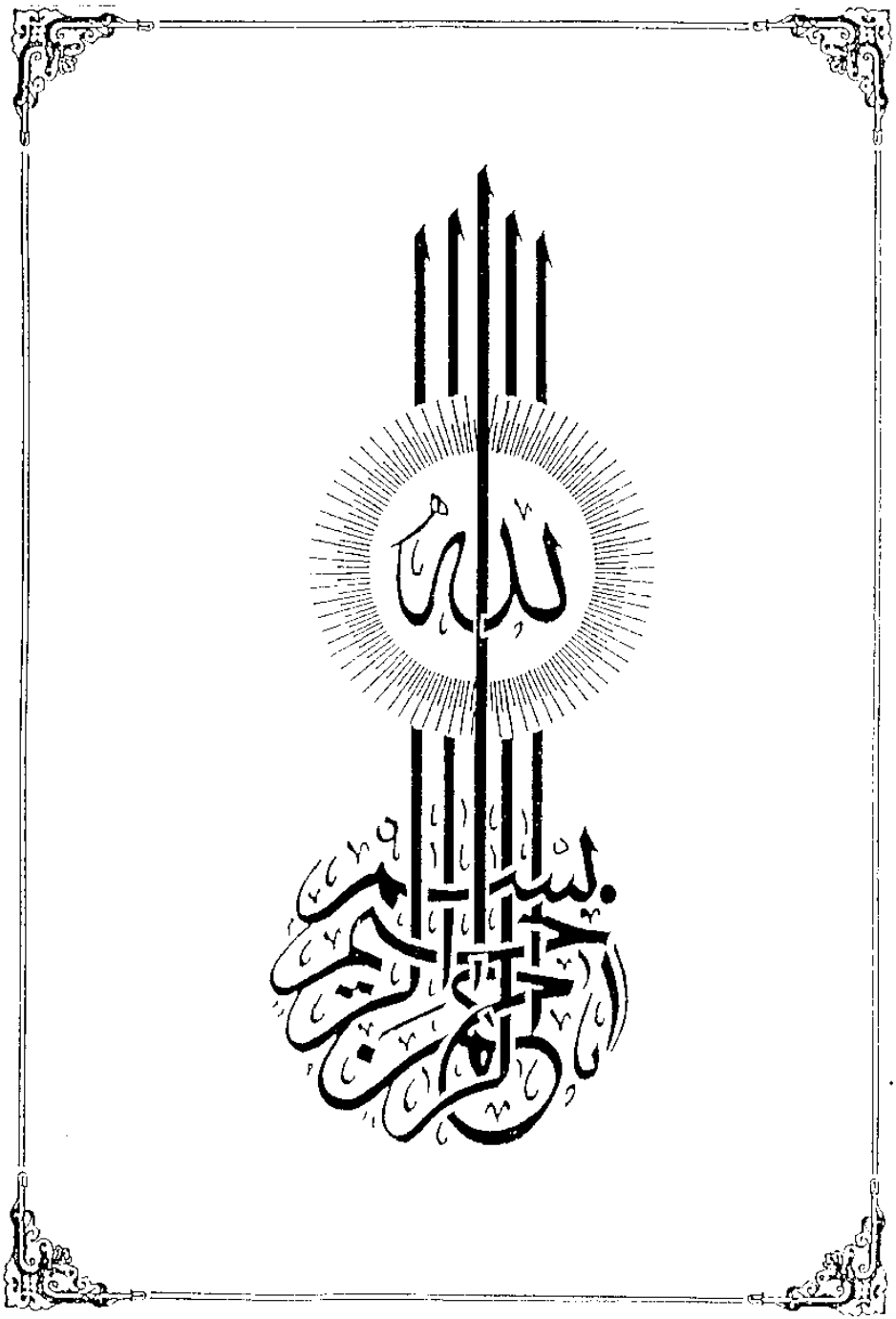

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LIST OF ABBREVATIONS

B- : Bioactive

BSA : Bovin Serum Albumin

DES : Diethylstiblesterol

DEME : Dubleccoc's Modified Eagle's medium

E_2 : Estrogen

ED_{50} : 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.

INTRODUCTION

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 determinents 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