HORMONE RECEPTOR ASSAY IN DIFFERENT MALIGNANT DISEASES

Essay

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Master Degree in Clinical Pathology

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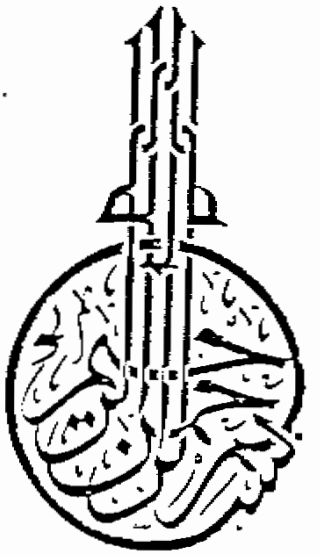
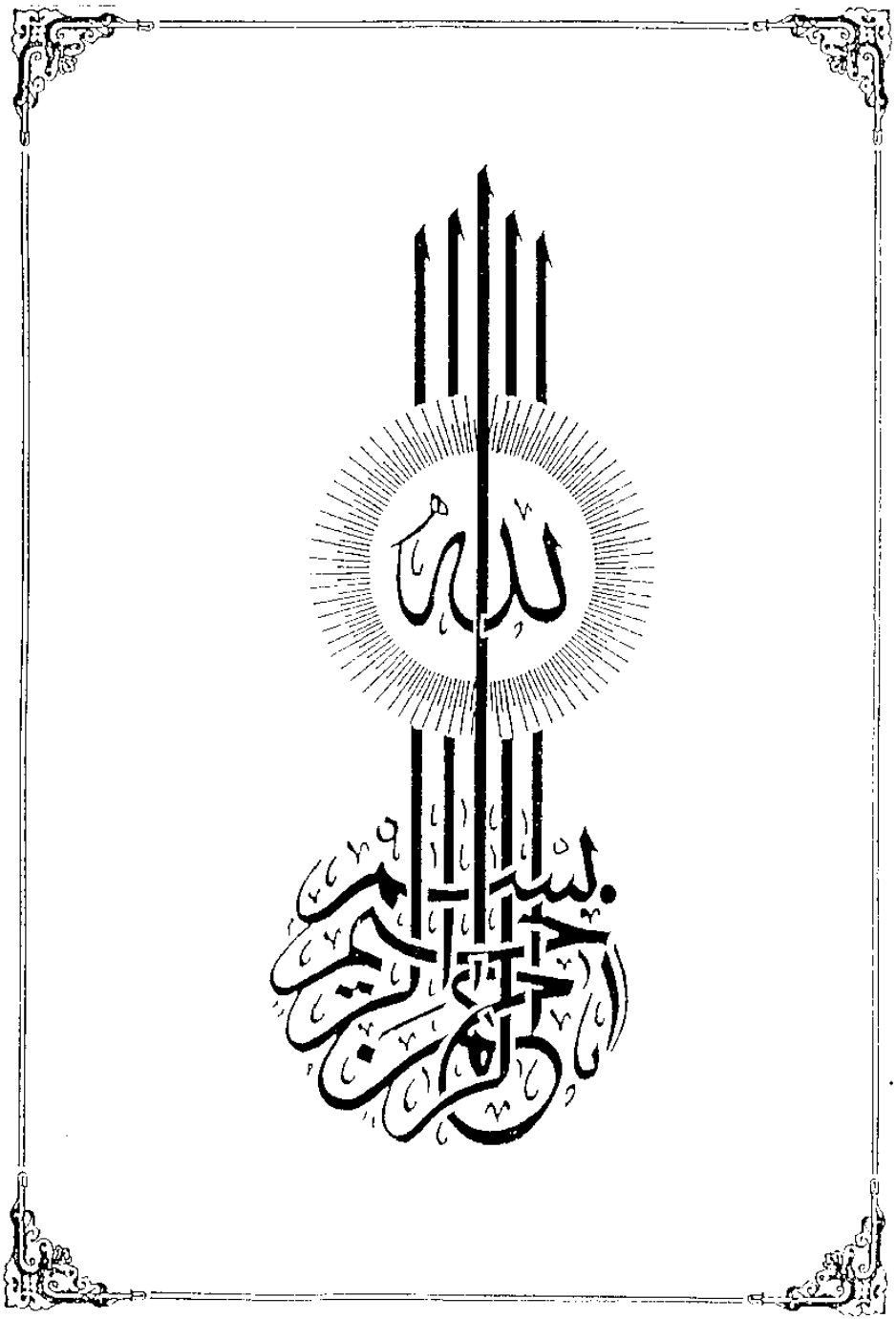


قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا

إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم



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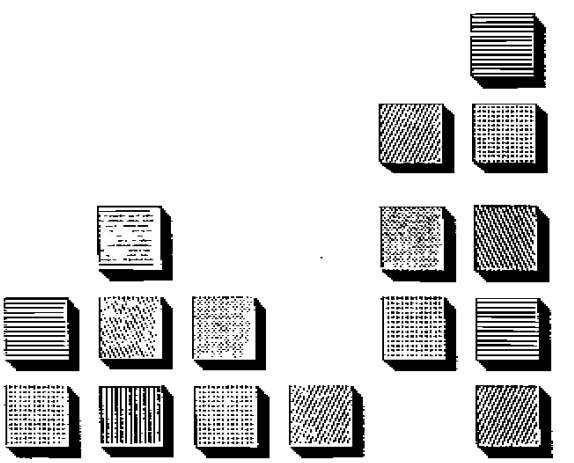
List of Abbreviations

AC ..... Adenyl cylase
ALL ..... Acute lymphblastic leukaemia
AR ..... Androgen receptor
ATP ..... Adenosine triphosphate
Ca ..... Calcium
cAMP ..... Cyclic adenosine monophosphate
DCC ..... Dextran coated charcoal
DNA ..... Deoxyribonucleic acid
E_1 ..... Esterone
E_2 ..... Estradiol
E_3 ..... Estriol
EIA ..... Enzyme immunoassay
ER ..... Estrogen receptor
FSH ..... Follicular stimulating hormone
GDP ..... Guanine diphosphate
GTP ..... Guanine triphosphate
ICA ..... Immunocytochemical assay
IRMA ..... Immunoradiometric assay
K-ATPase ..... Potassium adenosine triphosphatase
LH ..... Lutenizing hormone
Mg ..... Magnesium
Na-ATPase ..... Sodium adenosine triphosphatase
PAP ..... Peroxidase antiperoxidase
PR ..... Progesterone receptor
T_3 ..... Tri-iodothyronine
T_4 ..... Tetra-iodothyronine
TSH ..... Thyroid stimulating hormone

INTRODUCTION AND AIM OF THE WORK



INTRODUCTION

Hormone receptors are macromolecules in or on cells that mediate physiological responses upon binding specific hormones. Receptors bind their hormones with remarkable selectivity and high affinity, permitting a given physiological response to be elicited in the target tissues. Some of these receptors are located inside the cell, nuclear or cytoplasmic in origin, others are on the cell membrane **(Birnbaumer et al., 1974)**.

Hormones may be classified as lipid soluble and water soluble. The more lipid soluble hormones as steroid and thyroid hormones diffuse through the cell membrane and bind receptors in the cytoplasm and nucleus, respectively **(Hughes, 1984; Oppenheimer, 1985)**. On the other hand peptide hormones bind receptors located in the cell membrane **(Katt and Dufau, 1983)**.

The specific binding of hormones to receptors lead to generation of signals that modulate cellular functions. The signals may be expressed as an altered rate of enzyme activity or ion

transport which then leads to the characteristic physiological respons. Hormone receptors may regulate cellular hormone response through modulation of their number, binding affinity or coupling to their effector system. Several hormone receptors have been purified and understanding of their function at the molecular level is now being realised **(Bar and Roth, 1977)**.

In recent years, hormone receptor assay was found to be important in predicting the response to treatment and prognosis in some malignant diseases. In breast cancer, for example, the prognostic importance of oestrogen receptor (ER) content of the primary tumour has become apparent and hormone receptor status can help in predicting the risk of relapse, the overall survival and prognosis. Also, it was found that receptor status predicts which patient will benefit from hormonal treatment, involving ovariectomy and anti-oestrogen drugs as tamoxifin, as ER positive patients do better than ER negative patients **(Merkel et al., 1989)**.

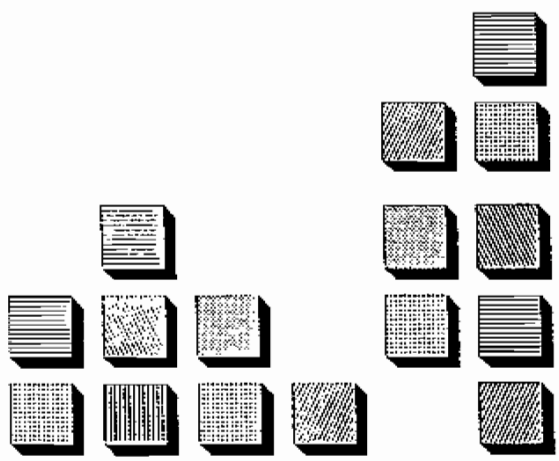
More recently, some studies postulated oestrogen sensitivity of tumours arising from melanoblasts as conjunctival malignant melanoma. It had been showed that this tumour have oestrogen receptor positivity **(Paridaens et al., 1991)**.

Aim of the Work

The aim of the present work is to give a detailed account on the hormone receptor assay, their clinical significance in some malignant diseases and their implications on therapy and prognosis.

Different methods of hormone receptor assay will be discussed.

TYPES AND VARIANTS OF HORMONE AND HORMONE RECEPTORS



CHAPTER I
TYPES AND VARIANTS OF HORMONE RECEPTORS

Hormone receptors are macromolecules in or on cells that mediate physiological responses upon binding specific hormones. Receptors bind their hormones with marked selectivity and high affinity, permitting a given physiological response to be elicited in the target tissue **(Roth and Grunfeld, 1985)**.

Some investigators have suggested that the term "receptor" should be reserved for those conditions in which both binding and biological response are observed and that a hormone binding site detected in the absence of biological response is referred to as "acceptor" **(Birnbaumer et al., 1974)**.