Analytical evaluation of chemiluminescence in alpha - fetoprotein estimation .

Thesis

Submitted for partial fulfillment

for Master degree in Clinical pathology.

BY

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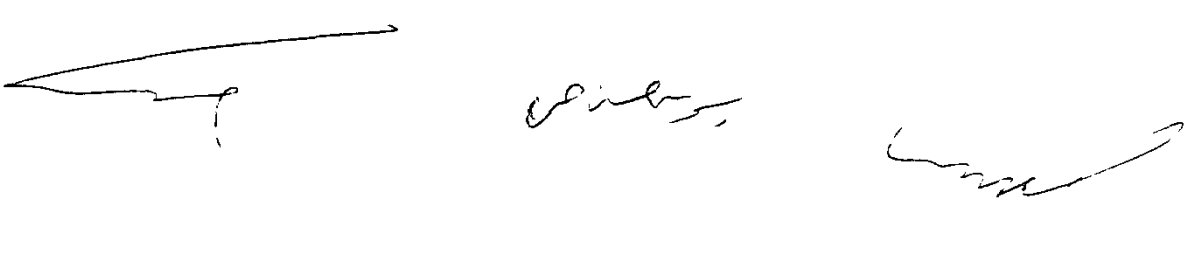

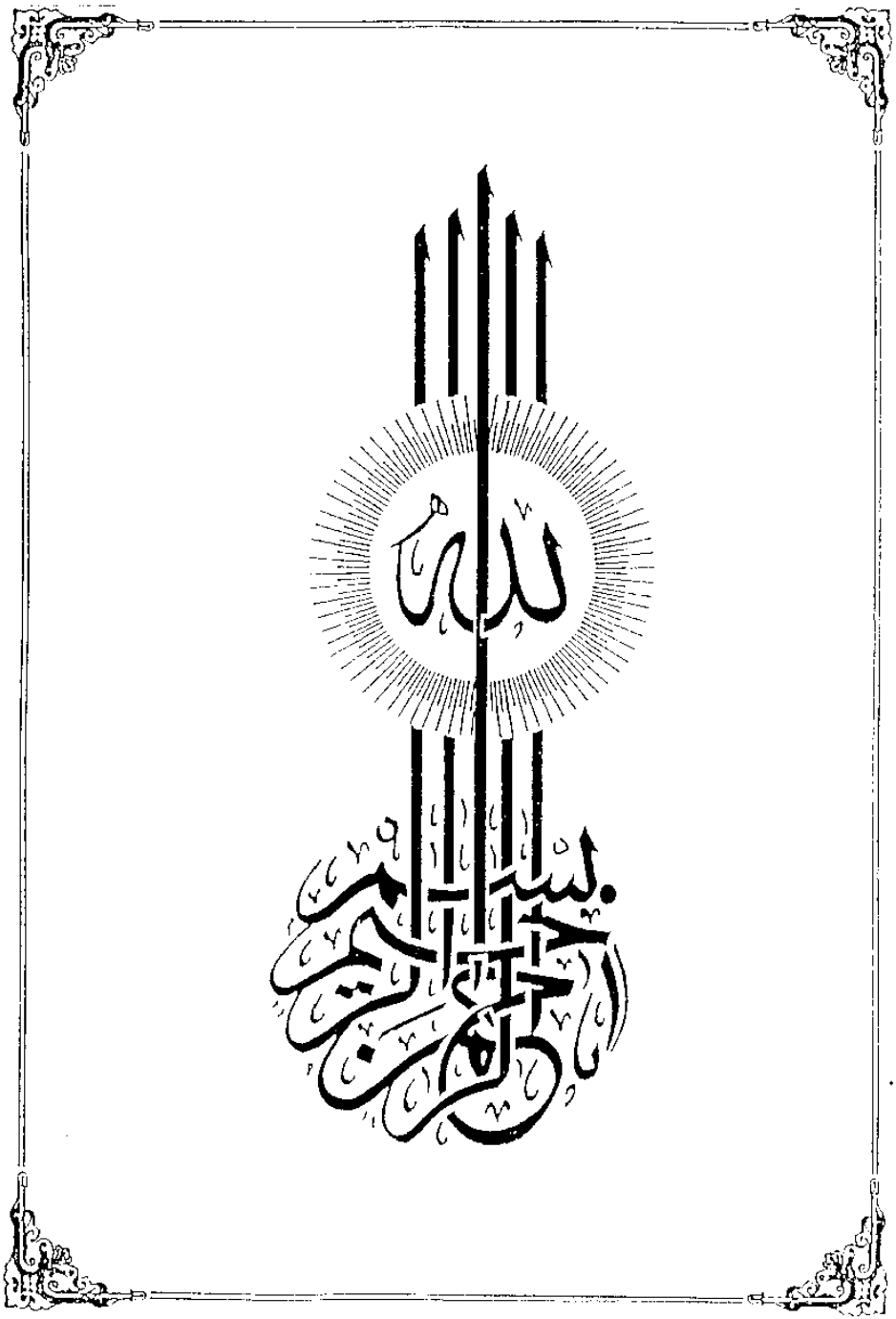

بسم الله الرحمن الرحيم

﴿ الحمد لله الذي هدانا
لهذا وما كنا لنهتدي
لولا أن هدانا الله ﴾

صدق الله العظيم

(سورة الأعراف -آية ٤٣)

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Thank you all

Samah

CONTENTS

ABBREVIATION LIST

AE :	*Acridinium ester*
AFAFp:	*Amniotic fluid alpha fetoprtein*
AFp :	*Alpha fetoprotein*
ALP :	*Alkaline phosphatase*
AMPPD:	*3-(2'-spiroadamantane) - 4 - methoxy - 4 - (3'' phosphoryloxy) phenyl - 1, 2 - dioxetane*
ATP :	*Adenosine triphophosphate*
CEA :	*Carcinoembryonic antigen*
CIEP :	*Counter immunoelectrophoresis*
CLIA :	*chemiluminescence immunoassay*
CNR :	*Concanavalin A non-reactive*
Con A:	*Concanavalin A*
CT :	*Computerized tomography*
CV :	*Coefficient of variation*
DDIA:	*Double diffusion in agar*
DELFIA:	*Delayed enhanced lanthanide fluorescent immunoassay*
DMAE:	*Dimethylated acridinium ester*
EIA :	*Enzyme immunoassay*
ELISA:	*Enzyme linked immunosorbent assay*
FDA :	*Food and Drug Administration*
FIAEC:	*Flow injection analyzer electrochemical detection system*

GO : *Glucose oxidase*

G1 : *One step glutaraldehyde*

HCC : *Hepatocellular carcinoma (primary hepatic malignancy)*

ICMA: *Immunochemiluminometric assay*

IEP : *Immunoelectrophoresis*

IRMA: *Immunoradiometric assay*

M-AFP: *Monoclonal Alpha fetoprotein*

M-ICMA: *Monoclonal Immunochemiluminometric assay*

M-ab : *Monoclonal antibody*

MSAFP: *Maternal serum Alpha fetoprotein*

NTD : *Neural tube defect*

ONTDS: *Open Neural tube defect*

P-AFP: *Polyclonal Alpha fetoprotein*

P-ICMA: *polyclonal Immunochemiluminometric assay*

P : *Probability*

PNPP: *Paranitrophenyl phosphate*

RAI(^{125}I): *Radioactive iodine (^{125}I)*

RIA : *Radioimmunoassay*

RLU : *Relative light* unit

SB : *Saccharides and Schiff base*

U/S : *Ultrasonography*

AMINO ACID ABBREVIATION

Asp : Aspartic acid

Thr : Threonine

Ser : Serine

Glu: Glutamic acid

Pro: Proline

Gly: Glycine

Ala: Alanine

Cys: Cysteine

Val: Valine

Met: Methionine

Ile: Isoleucine

Leu: Ieucine

Tyr: Tyrosine

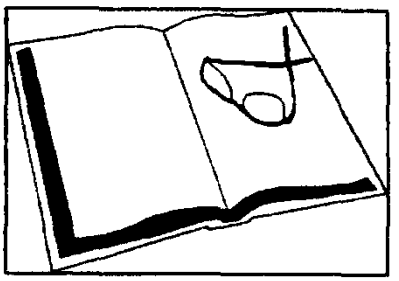
Phe: Phenyl alanine

Lys: Lysine

His: Histidine

Arg: Arginine

Trp: Tryptophan



INTRODUCTION

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INTRODUCTION

Measurement of serum alpha fetoprotein (AFp) plays a very important role in diagnosis, predicting prognosis and offering follow- up programs for many serious diseases, either malignant or not. The development of immunoassay techniques during the last three decades have permitted a sensitive quantification of AFp.

Problems of performance and stability are common to all immunoassays, which utilize I^{125} since it is a high energy emitter with a half life of only sixty days. Several disadvantages are encountered in the technique, including counting time (Several minutes), Inconsistency in separation of the free and bound complexes and radiation hazards.

Therefore non- isotopic immunoassay techniques have been introduced including Fluorescent immunoassay and ELISA which solved some of the previously mentioned RIA limitations. However new problems arouse with the use of the ELISA technique. The most critical factors for reaction were the time and temperature accuracy.

Recently chemiluminescent compounds are introduced as labels for immunoassay . These compounds have several advantages over RIA and even ELISA techniques. These include very short counting time (Seconds), long reagent stability, safety, temperature independent reactions, no centrifugation and incubation could be done at room temperature

AIM OF THE WORK

Evaluation of the chemiluminescence technique as regards reliability characteristics as precision, sensitivity, specificity and accuracy as well the practicability characteristics.

Review of Literature