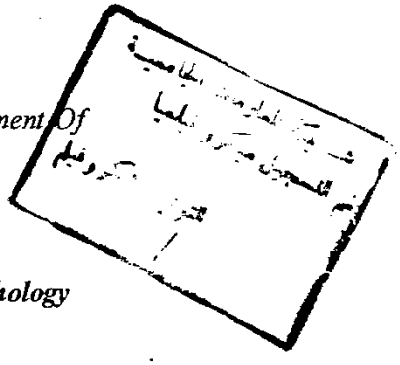
HEMATOPOIETIC GROWTH FACTORS



ESSAY

Submitted For Partial Fulfilment Of
Master Degree

In

Clinical and Chemical Pathology

By

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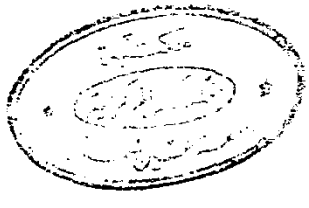
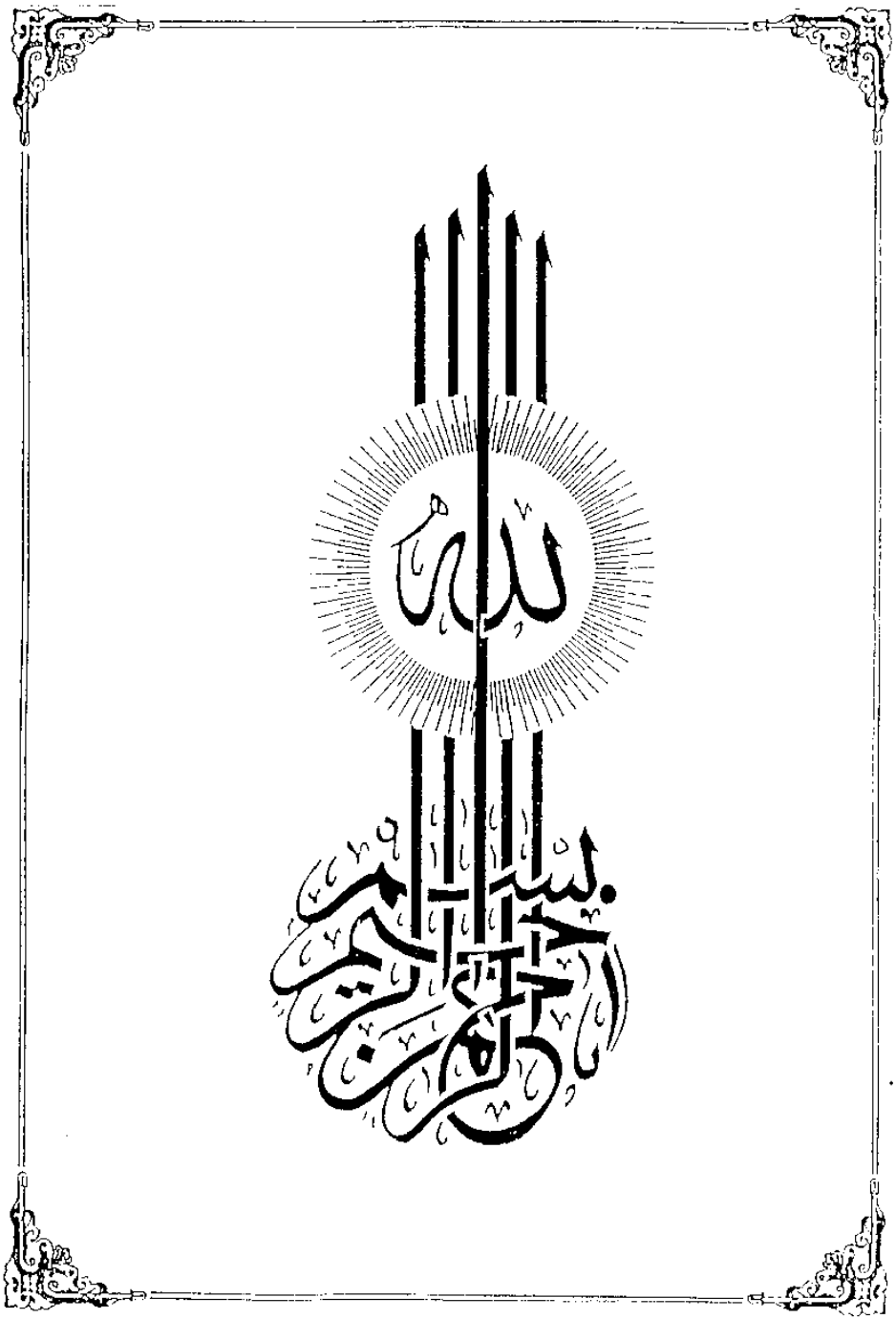
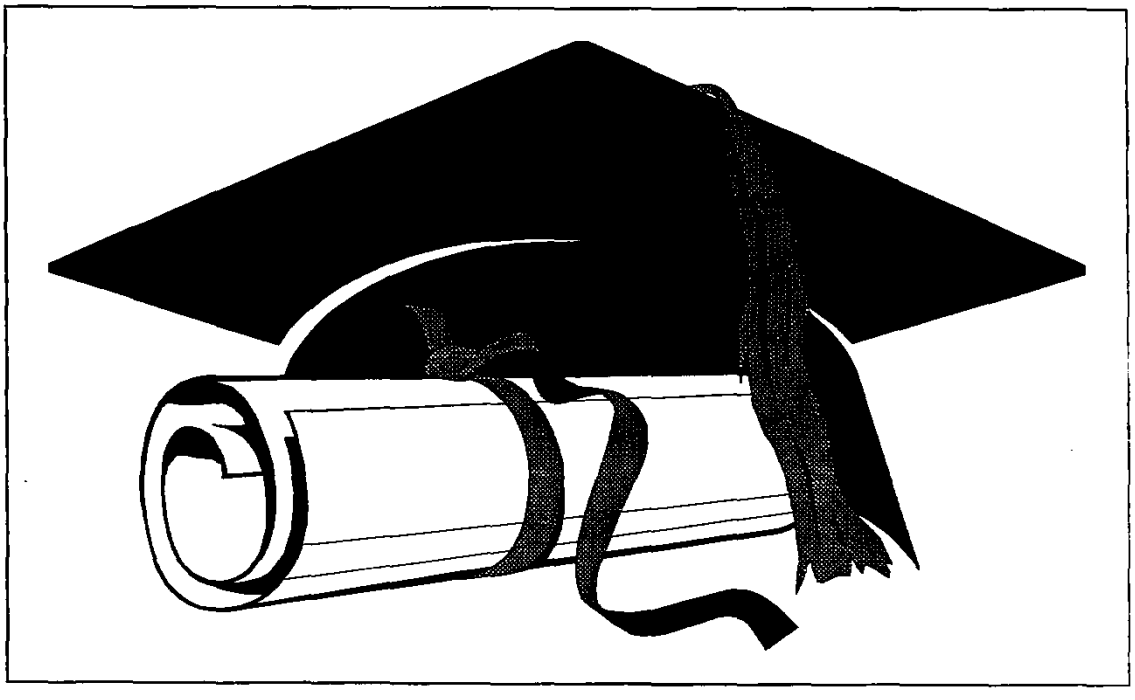
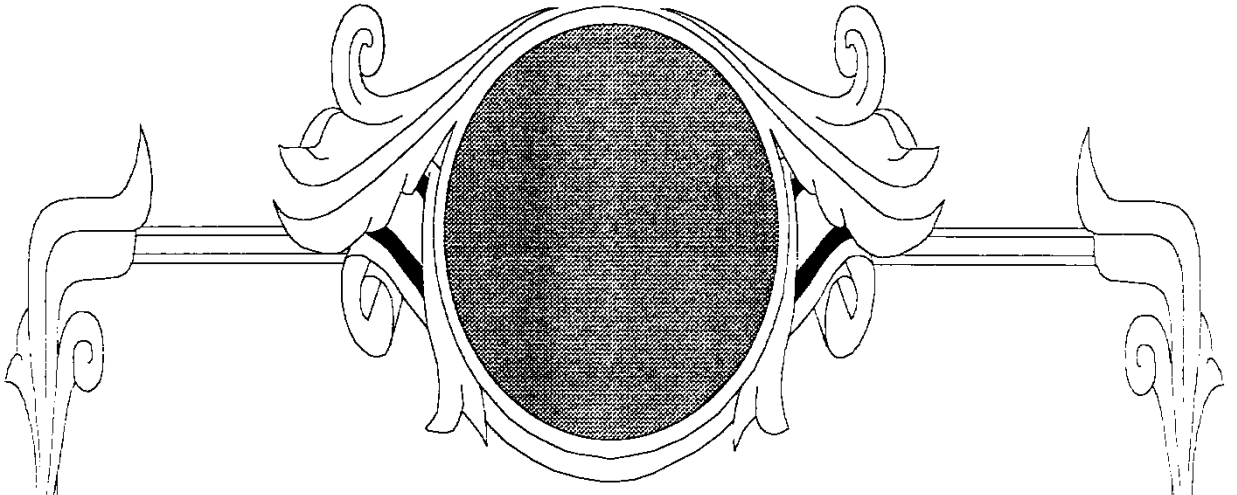


To My Beloved Husband,
My Mother,
And To The Memory Of My Father



Hematopoietic Growth Factors





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LIST OF ABBREVIATIONS

ABMT	Autologous bone marrow transplantation
ADCC	Antibody-dependent cell-mediated cytotoxicity
ATN	Acute tubular necrosis
AZT	Zidovudine drug
BAF	B-cell activating factor
BCDF	B-cell differentiating factor
BCGF-1	B-Cell growth factor-1
BCL	B-cell leukemia
BFU-E	Burst forming unit -erythroid
BMT	Bone marrow transplantation
BSF-2	B-cell stimulating factor-2
CAPD	Continuous ambulatory peritoneal dialysis
CFC	Colony-forming cell
CFU	Colony-forming unit
CFU-E	Colony-forming unit -erythroid
CFU-EM	Colony-forming unit -erythroid- megakaryocyte
CFU-G	Colony-forming unit -granulocyte
CFU-GM	Colony-forming unit- granulocyte macrophage

CFU-GEEM	Colony-forming unit -granulocyte erythroid macrophage megakaryocyte
CFU-S	Colony-forming unit spleen
CLMF	Cytotoxic lymphocyte maturation factor
CSA	Colony-stimulating activity
CSF	Colony-stimulating factor
DIC	Disseminated intravascular coagulopathy
DMSO	Dimethyl sulphoxide
ECM	Extracellular matrix
EDF	Eosinophil differentiating factor
ELISA	Enzyme-linked immunosorbant assay
EPO	Erythropoietin
G-CSF	Granulocyte-colony stimulating factor
GEMM	Granulocyte-Erythroid-Macrophage-Megakaryocyte
GM-CSF	Granulocyte-macrophage colony stimulating factor
GVHD	Graft versus host disease
HD	Hemodialysis
HGF	Hematopoietic growth factor
HPC	Hematopoietic progenitor cells

HPP	High proliferative potential
HM	Hematopoietic microenvironment
IFN	Interferon
IL-2	IL-2 receptor
IL-1ra	Interleukin-1 receptor antagonist
LAF	Lymphocyte activating factor
LAK	Lymphocyte activated killer cell
LCAL	Large cell anaplastic lymphoma
LGL	Large granular lymphocyte
LIF	Leukemic inhibitory factor
LPS	Lipopolysaccharide
LTMC	Long-term marrow culture
MAF	Macrophage activating factor
MCGF-2	Mast cell growth factor-2
M-CSF	Macrophage-colony stimulating factor
MDS	Myelodysplastic syndrome
MGF	Mast cell growth factor
MHC	Major histocompitability complex
MIF	Migration inhibitory factor

PBMC	Peripheral blood mononuclear cells
PDGF	Platelet-derived growth factor
PGE-2	Prostaglandin E2
PHA	Phytohemagglutinin
rHuEPO	Recombinant human erythropoietin
REF	Renal erythropoietic factor
rHuG-CSF	Recombinant human granulocyte-colony stimulating factor
rHuGM-CSF	Recombinant human granulocyte macrophage-colony stimulating factor
rPDGF	Recombinant platelet-derived growth factor
SCF	Stem cell factor
SMAF	Specific macrophage arming factor
TCGF-2	T-cell growth factor-2
TDF	Thymus differentiation factor
TGF-B	Transforming growth factor-B
TH2	T-helper cell
TNF	Tumor necrosis factor
TRF	T-cell replacing factor

Introduction

INTRODUCTION

Within the environment of the bone marrow, hematopoietic stem cells and their more developmentally committed progeny are exposed to a variety of stimuli. These include:

(1) physical interactions with other cells, mediated through specific cell adhesion molecules;

(2) Interactions with extracellular matrix molecules;

and (3) Exposure to a number of growth stimulating and growth inhibitory cytokines. These stimuli work together to regulate the self-renewal and differentiation of stem cells and the formation of mature blood cells from their progeny (Dexter, 1992).

Human hematopoietic growth factors (HGFs) are a complex family of glycoproteins considered to be the major regulatory molecules supporting constitutive and inducible hematopoiesis (Brach and Herrmann, 1991).

Molecular biology techniques have led to the identification and cloning of a series of HGF genes, and the synthesis of large amounts of these molecules has facilitated not only biological investigations on their physiological functions and the network of their interactions, but also, it did help much in clinical trials aiming to assess the therapeutic efficacy of these molecules (Polli, 1991).

At least 18 growth factors that play a role in hematopoiesis have been molecularly cloned and purified to homogeneity (Dexter, 1992), and some have been used in patients with a variety of clinical conditions requiring an enhancement of hematopoietic proliferation and/or differentiation and/or function (Polli, 1991).

According to their capacity to target distinct hematopoietic cell subsets,these polypeptides can be classified into several categories; Hematopoietic growth factors per se include the colony-stimulating factors which act directly on various hematopoietic subpopulations and