سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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سامية محمد مصطفى

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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بالرسالة صفحات لم ترد بالأصل

بسم الله الرحمن الرحيم

"وقل رب زدنی علما"

صدق الله العظيم

STUDY OF BONE TURNOVER IN HEALTHY ELDER SUBJECTS

Thesis

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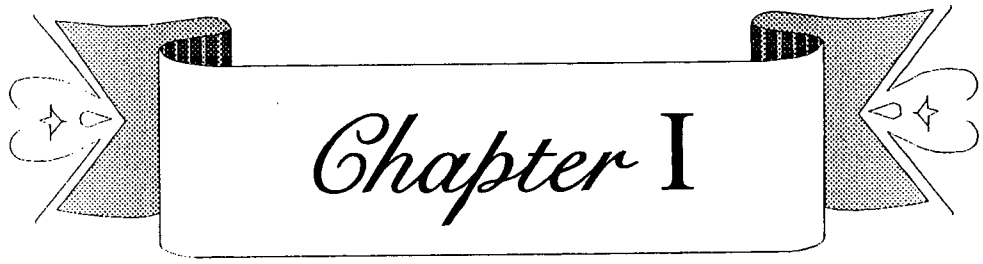

INTRODUCTION

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Aging

Nowadays, there is increasing need to learn about aging and its biological processes, as one of the phenomena of the present time is rapidly increasing numbers of the elderly. Many old people can be a burden to themselves, their families and the communities in which they live. Aging is a general physiological process, part of the cycle being at conception and ending with death.[1]

As yet there is no precise definition of aging. A number of attempts have been made to establish criteria for biological aging in humans which can be identified as follows[2]:

1. The increased mortality with age after maturation.
2. The well-documented changes in the chemical composition of the body with age. These changes include a decrease in lean body mass and increase in fat. The increase in lipofuscin pigment (age pigment) in certain tissues and increased cross linking in matrix molecules such as collagen.

3. The reduced ability to respond adaptively to environmental change. This can be demonstrated at all levels from molecule to organism. Thus the changes of age not so much the resting pulse rate or fasting serum glucose but the ability to return these parameters to normal after physiological stress.
4. The increased vulnerability to many diseases with age.[4]

Theories of Aging :

There are many theories to explain the aging process, among these the following classification is put:

I. Genetic Molecular Theories:

Which study the genetic aspect of aging.

1. ***Altered Protein Turnover***:

The genetic information stored in DNA is transferred from DNA to messenger RNA (mRNA) by the process of transcription. This (mRNA) is then translated into protein. This theory is based on the hypothesis that the process of translation is slowed with age and thus, the rate of protein biosynthesis is altered and many proteins are produced more slowly in aged cells than their younger counter parts.

Delays have been identified in all of four major stages of protein synthesis, including aminoaylation of transfer RNA, initiation, elongation and termination.[2,5]

2. ***Gene Regulation Theory***:

Growth and development are regulated by a systematic turning on and off of various genes, so aging might represent a process in which systematic modifications in gene expression result in age related physiologic and pathologic changes.[6] This theory state that aging is genetically controlled, the whole process from conception, differentiation, growth and senescence is under a regulatory gene complex.

Two main concepts of genetic control:

a) One such concept assumes the actual presence of unique genes for aging, that is to say aging is programmed.

b) The other assume that there are no unique gene for aging instead senescence is the result of imbalance in the interaction between genes responsible for maintenance of the mature reproductive phase, hence a gradual decline in reproductive rate with age.[7,8]

3. DNA Damage and Repair Theory:

This theory hold that throughout life, DNA is constantly damaged and repaired, age related impairments, in repair mechanism might be expected to be associated with progressive decline in cellular function. However, DNA repair capacity have generally not been well correlated with life spane.[6,8]

4. Somatic Mutation Theory:

This theory states that mutation resulting from back ground radiation and radio-mimetic agents will accumulate and produce functional failure and death. But now discounted as the level of radiation would have to be for too high to explain aging changes. Radiation act primarily on dividing cells lines as leukocytes and gut epithelial cells, in contrast effect of age are centered in cells that no longer divide such as nerve and muscle cells.[6,7]

II. Cellular Level Theories:

These theories concerned with changes that occur in the structure and function of cells with the passage of time.

1. Age Pigment (Lipofuscin):

Aging can be related to accumulation within the cells of age pigment, this pigment originate by a process of autophagocytosis involing lysosomes, it is predominatly deposited in non dividing cells such as liver, adrenal