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Cairo University
Faculty of Science

GENOTYPE AND PHENOTYPE MAPPING STUDY OF OBESITY IN ALBINO MICE.

A Thesis Submitted by

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For the Fulfillment of
Master Degree of Science in
(Biochemistry)

To

Biochemistry Department
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-2010-

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APPROVAL SHEET FOR SUBMISSION

Title of (M.Sc) Thesis: ***Genotype and phenotype mapping study of obesity in albino mice.***

Name of the Candidate: ***Nashwa Mohammad Shams Eldin Ali Ali Abd Elaal***

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ABSTRACT

Name: ***Nashwa Mohammad Shams Eldin Ali Ali Abd Elaal***
Title of Thesis: ***Genotype and phenotype mapping study of obesity in albino mice.***
Degree: ***M.Sc. of Science in Biochemistry, Chemistry Department Faculty of Scince, Cairo University, 2010.***

Our knowledge of the genetic factors affecting obesity is increasing, but information about the individual gene effects remains limited in humans as well as in animal models. The aim of this study is to investigate the effects of high-caloric diets on the level of gene mutation and aberration and protein expression. Attempts to define the genetic basis of obesity (genotype and phenotype). Finally, to determine common DNA variation associated with obesity as a genetic marker. **Results:** there was highly significant ($P<0.05$) of cytogenetic aberrations in obese groups in comparison to control group. Also, there was differentiation in *ob* gene in all obese groups versus to control group. Finally, there were differences in protein expression by up- and down-regulation in obese groups in comparison to control group. **Conclusion:** from this study, we can conclude that high-caloric diet - which is one of the environmental factors - has a profound effect on the genetic and protein expression leading to obesity. Also, high-sucrose diet has the lower effect on the genetic and protein expression than the other both diets, while the combined diet (high fat-sucrose diet) has the stronger effect than the other both diets. As a result of high-caloric diet, there were high chromosomal aberrations, there was a differentiation occurred in the *ob* gene and there were difference in protein expression (up- and down-regulation) that was detected in obese groups in comparison to control group. The effect of high-caloric diet was reflected in the serum of obesity groups by measuring the biochemical parameters (total cholesterol, triglycerides and glucose) which indicated elevation than normal levels in comparison to control group.

Key Words: Obesity, Chromosome, Aberration, RFLP, Protein expression, High-caloric diet, *ob* gene, Albino mice.

Under Supervision of: Prof. Dr. ***Fathy Mohammad Abd Elgilil***
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To My Family

I dedicate this thesis to my beloved family, words stand short when coming to express my deepest thanks, especial appreciation and gratitude to the soul of my father, for his moral support, cherish and blessing me, to my beloved mother for her had been learning the interesting of the science and encouraged me through this study, my brothers and my sister. Also many thanks for my beloved husband for his concern, cherish and patience, my daughter Salma for enriching my life.

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To all of you, Thank you!

Nashwa M. Shams Eldin

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