TABLE OF CONTENTS

Chapter III

Materials and Methods

Chapter IV

Chapter V
Arabic Summary

LIST OF FIGURE

LIST OF TABLES

LIST OF SYMBOLS AND TERMINOLOGY

ARC	Arcuate Nucleus
AgRP	Agouti-related peptide
BBB	Blood brain barrier
BMI	Body mass index
bp	Base pairs
C	Cyctein
C-terminal	COOH or Carboxyl-terminal
CCK	Cholecystokinin
cDNA	Complementary DNA
CI	Confidence interval
CART	Cocaine- and amphetamine-regulating transcripts
CRH	Corticotrophin releasing hormone
db/db	Diabetic rat
DNA	Deoxyribonucleic acid
DMH	Dorsomedial hypothalamic nucleus
EDTA	Ethylene diamine tetra acetic acid
FFA	Free fatty acids
IL-6	Interleukin 6

JAK	Janus-Activated kinase
KSA	Kingdom of Saudi Arabia
Kg/m^2	Kilograms/ meter ^{2}
Kb	Kilo base
KDa	Kilo dalton
Lep gene	Leptin gene
LepR	Leptin receptor
MAPK	Mitogen-Activated Protein Kinase
MluI	Micrococcus luteus
mg	Milligram
ml	milliliter
μl	Micro liter
ng/ml	Nanogram/milliliter
NPY	Neuropeptide Y
N-terminal	Amino-terminus or NH2-terminus
Ob	Obese
ob/ob	Obesity mice
Ob gene	Obese gene
ObR	Leptin receptor
OB-Ra	Leptin Receptor Short-form (type a)
OB-Rb	Leptin Receptor Long-form (type b)
Ob-Rc	Leptin receptor type c

Ob-Rd	Leptin receptor type d
Ob-Re	Leptin receptor type e
OR	Odds ratio
PCR	Polymerase Chain Reaction
POMC	Proopiomelanocortin
PPY3 -36	Pancreatic peptide Y3-36
PTP1B	Phosphoryrosine phosphotase 1B
PVN	Paraventricular nuclei
RR	Risk ratio
RFLP	Restriction fragment length polymorphism
rpm	Round per minute
S	Second
STAT	Signal transducers and activators of transcription
SOCS-3	Suppresser of cytokine signaling 3
SNPs	Single nucleotide polymorphisms
SD	Standard deviation Sciences
SPSS	Statistical Package for Social
T	Thiamine
TBE	Tris-base- boric acid- EDTA buffer
TM	Transmembrane domain
TG	Triglycerides
U	Unit

VMH	Ventromedial Hypothalamic Nucleus
WAT	White adipose tissue.
WHO	World Health Organization
X^2	Chi squre
α	Alpha
α MSH	α melanocyte stimulating hormone.

Chapter I

Introduction

Obesity has reached epidemic proportions to its prevalence in many developed and developing countries. At its simplest level obesity can be defined as an imbalance between the energy that is ingested (Energy In) and the energy that is expended (Energy Out). Obesity and weight gains are major health problem which increased among Saudi population over the past thirty years. The total obesity reached in national study on Saudis adults in 2005 to 35.5%. (Al-Nozha *et al.*, 2005*; Al-Sultan *et al.*, 2006; Enriori *et al.*, 2006 ; Marti1 *et al.*, 2009; Bahathiq, 2010).

According to World Health Organization (WHO) statistics, in 2008 39.1% females and 28.6% males were obese in Saudi Arabia .This value is higher than that reported in the British, Australian, Americans and Italian populations. It is rising and alarming, especially among females (Al-Nozha *et al.*, 2005; Bahathiq, 2010). So health authorities must take the necessary measures to fight obesity responsible for many health problems and start health education programs about the health risks of obesity on the individuals. Scientific researches are also needed to identify the causes of obesity, its treatment how to prevent it, improve eating habits and levels of physical activity to the community.

Recently, several studies have been directed to investigate the variations in the level of leptin (obesity hormone), derived from adipose tissue in an attempt to

determine if it can be used as a marker of obesity .Since leptin works to reduce appetite and increase energy expenditure by binding to its receptor, Studies have focused on the leptin receptor polymorphisms because they are considered one of the genetic factors that cause obesity, in an attempt to determine its role in the development of obesity (Al-Sultan, *et al.,* 2006).

One of the polymorphism of leptin receptor is SER 343 SER, which resulted by silent mutation gene across the replacement of nitrogen base of thymine to cytosine (T-C) AGT/AGC in the extracellular domain of the receptor. This replacement gave the amino acid serine again because it has six genetic codes (TCT- TCC- TCA- TCG- AGT - AGC).

This study aims to detect the presence of SER343SER leptin receptor polymorphism in obese patients of both genders in Jeddah city. To investigate the frequency of alleles of SER343SER in Jeddah population, DNA was extract from blood samples, the PCR product was digested with the restriction enzyme *MluI* to detect alleles of SER343SER and data was statistically analyzed by using SPSS software.