List of Figures

Chapter 1: Review of Literature 1.1 Worldwide prevalence of Diabetes Mellitus	2
1.1 Worldwide prevalence of Diabetes Mellitus	2
1.2 Regulation of blood glucose levels	4
1.3 Diagnostic criteria for Diabetes Mellitus	6
1.4 Pathophysiology of hyperglycemia in T2D	9
1.5 Insulin signalling pathway	11
1.6 T2D pathogenesis in WAT	13
1.7 Adiponectin signalling pathways	15
1.8 Pleiotropic effects of adiponectin	15
1.9 Mitochondrial dysfunction in T2D	18
1.10 Glucose stimulated insulin secretion	19
1.11 Mechanism of β-cell dysfunction	20
1.12 β-cell regenerative lineages	23
The potential effect of L-glutamine supplementation on	27
metabolic variables in diabetes mellitus	21
1.14 Possible mechanisms of the beneficial effects of pitavastatin	29
Chapter 2: To evaluate the association of ADIPOQ polymorphisms with T2D in Gujarat population and to study the possible genotype-phenotype correlation with plasma adiponectin levels and metabolic parameters	
2.1 PCR-RFLP analysis of ADIPOQ -11377 (rs266729) C/G, +10211 T/G (rs17846866), and +276 G/T SNPs(rs1501299):	53
2.2 Linkage disequilibrium analysis of <i>ADIPOQ</i> SNPs in Gujarat population	58
2.3 HMW adiponectin/ total adiponectin ratio	59
2.4 Role of <i>ADIPOQ</i> SNPs in T2D	65
Chapter 3: To investigate the therapeutic potential of small molecule enhancers for adiponectin (pitavastatin) and GLP-1 (L-glutamine) secretion in T2D mouse model	
3.1 The experimental timeline and Strategy	75
3.2 FBG and Body weight in T2D mouse model	82
Fasting blood glucose (FBG) and body weight (BW) in drug treated groups	83
Intraperitoneal glucose tolerance test (IPGTT) & 3.4 intraperitoneal insulin sensitivity test (IPIST) in the drug treated animals	84
3.5 Plasma lipid profile	86
3.6 Plasma insulin & adiponectin levels	87
Glucoregulatory enzymes gene expression and activities in liver	89
3.8 Mitochondrial biogenesis marker levels in skeletal muscle	91
3.9 Ratio of oxygen consumption rate	92
3.10 Insulin signalling pathway	93
3.11 Immuno-histochemistry of pancreatic Islets of Langerhans at 60X	95

3.12