CHAPTER 6.0 SUMMARY AND CONCLUSION

Diet high in fructose induce IR in experimental rats and reduce insulin sensitivity associated with impaired action of hepatic insulin and also glucose disposal from the body. Statistical analysis of biochemical parameters in blood showed a significant increase level of creatinine, glucose, insulin, LDL, TC, TG, urea, uric acid, VLDL and NO and decreased concentration of albumin, HDL and total protein in group 2 rats when compared with group 1 rats. Further, the co-administration of curcumin along with fructose (Group 4) showed the reinstating of most of the biochemical parameters. The analysis with kidney and liver tissues showed significant decrease in CAT, GPx, hexokinase, hydroperoxides, GSH, SOD, vitamin C and E and increased glucose 6-phosphatase, fructose 1,6-bisphosphatase and TBARS in group 2, when compared with group 1 rats. In group 4 rats, the administration of curcumin along with fructose showed an effective contribution of curcumin in changing the antioxidants and metabolic enzymes. Molecular docking study reveals that the binding efficiency of curcumin with PPARγ showed high while compare with the pioglitazone. Further, gene expression study shows that ET-1, FOXO1 were upregulated and PDX-1, PGC 1α were downregulated in group 2 rats when compared to group 4 rats. Histopathological studies of kidney and liver shows that the abnormal changes and organ damages were seen in group 2 rats when compared to group 4 rats.

In conclusion, the results of the study demonstrate that curcumin has potential antihyperglycemic effect through regulating the metabolic enzymes, antioxidants, lipid peroxidation, lipids and renal markers. In addition, curcumin interacts with PPARγ as agonist modulates the genes expression in fructose diet induced insulin resistance in rats. Overall, this study revealed that co-administration of curcumin along with fructose prevents the metabolic abnormalities caused by high fructose diet in rats. Thus administration of curcumin as a food supplement might be a beneficial novel therapeutic option for insulin resistance.