Contents

Chapters

Chapter.1

1. Introduction 1

Chapter.2

2. Review of literature 6
   2.1. Insulin signaling and insulin action 7
   2.2. Insulin resistance 16
   2.3. Oxidative stress and antioxidants 20
   2.4. Redox homeostasis and redox signaling 33
   2.5. Oxidative stress and redox sensitive serine kinase pathways and insulin resistance 39

Chapter.3

3. Aim and objectives 42

Chapter.4

4. Potential role of oxidative stress and redox sensitive serine kinase pathways in the pathogenesis of insulin resistance in rat L6 myotubes 45
   4.1. Background 46
   4.2. Aim and objectives 49
   4.3. Materials and methods 50
   4.4. Results 61
   4.5. Discussion 76
   4.6. Conclusion 85
Chapter 5

5. Potential role of oxidative stress and redox sensitive serine kinase pathways in the pathogenesis of insulin resistance in high fat fed rats
   5.1. Background 87
   5.2. Aim and objectives 89
   5.3. Materials and methods 90
   5.4. Results 103
   5.5. Discussion 118
   5.6. Conclusion 125

Chapter 6

6. Potential role of oxidative stress and redox sensitive serine kinase pathways in the pathogenesis of insulin resistance in type 2 diabetes and rheumatoid arthritis
   6.1. Background 127
   6.2. Aim and objectives 128
   6.3. Materials and methods 129
   6.4. Results 133
   6.5. Discussion 140
   6.6. Conclusion 143

Chapter 7

7. Summary 144

Chapter 8

8. Conclusion and scope for future studies 149

Chapter 9

9. Bibliography 152

Publications