

Table of contents

TABLE OF CONTENTS	3
ACKNOWLEDGEMENTS	5
LIST OF MANUSCRIPTS	6
ABSTRACT	7
RESUMEN	8
CHAPTER 1: LITERATURE BACKGROUND	9
1.1 INTRODUCTION.....	9
1.2 RESEARCH QUESTION AND WORKING HYPOTHESIS	11
CHAPTER 2: IMPORTANCE OF REDOX SIGNALING IN SKELETAL MUSCLE – AN OVERVIEW	12
2.1 REDOX SIGNALING IN MUSCLE.....	12
2.2 ROS PRODUCTION DURING MUSCULAR ACTIVITY	13
2.3 MITOCHONDRIA AS A ROS SOURCE IN SKELETAL MUSCLE.....	14
2.4 NOX EXPRESSION IN SKELETAL MUSCLE.....	14
CHAPTER 3: EXERCISE-STIMULATED ROS PRODUCTION: ROLE OF NOX2	16
CHAPTER 4. ROLE OF NOX2 IN EXERCISE SIGNALING	19
4.1 MITOGEN-ACTIVATED PROTEIN KINASES (MAPKs) ACTIVATION.....	19
4.2 GENE EXPRESSION OF ANTIOXIDANT DEFENSE PROTEINS	20
4.3 MITOCHONDRIAL BIOGENESIS	20
4.4 REDOX CONTROL OF MYOKINE EXPRESSION.....	21
5. CHAPTER FIVE: NOX2 IS A NOVEL REGULATOR OF EXERCISE-STIMULATED GLUCOSE UPTAKE	23
5.1 REGULATION OF EXERCISE-STIMULATED GLUCOSE UPTAKE.....	23
5.2 ROLE OF ROS IN REGULATING GLUCOSE TRANSPORT IN SKELETAL MUSCLE.....	23
5.5 WHICH DOWNSTREAM MECHANISMS MIGHT MEDIATE NOX2-DEPENDENT GLUCOSE UPTAKE?	24
6. CHAPTER SIX: METHODOLOGICAL CONSIDERATIONS	25
6.1 APOCYNIN AS A NOX2 INHIBITOR.....	25
6.2 ASSESSING ROS PRODUCTION DURING <i>IN VIVO</i> EXERCISE	25

6.2.1 <i>Generically-encoded redox biosensors</i>	26
6.2.2 <i>In vivo redox histology</i>	26
6.3 GLUT4 TRANSLOCATION.....	28
7. CHAPTER SEVEN: CONCLUSIONS AND PERSPECTIVES	29
7.1 CONCLUSIONS	29
7.2 FUTURE PERSPECTIVES.....	29
8. LIST OF REFERENCES.....	30
9. MANUSCRIPTS	37