

## TABLE OF CONTENTS

RATIFICATION PAGE .....	ii
ASSERTION.....	iii
ACKNOWLEDGEMENT .....	iv
TABLE OF CONTENTS.....	v
LIST OF TABLES .....	vii
LIST OF FIGURES.....	viii
LIST OF APPENDICES .....	ix
LIST OF ABBREVIATIONS .....	x
ABSTRACT .....	xii
INTISARI.....	xiii
CHAPTER I .....	1
I.1. Background .....	1
I.2. Problem Formulation .....	3
I.3. Research Authenticity .....	3
I.4. Research Aim .....	4
I.5. Research Benefits.....	4
CHAPTER II.....	6
II.1. Literature Review .....	6
II.1.1. Anatomy of Hippocampus in Human .....	6
II.1.2. Stroke .....	9
II.1.3. Ischemic Reperfusion Injury .....	13
II.1.4. Transient Global Brain Ischemic Injury Rat Models .....	14
II.1.5. Memory .....	18
II.1.6. Neuronal Nuclear Protein (NeuN) .....	22
II.1.7. Vitamin D.....	23
II.2. Background Theory .....	25
II.3. Theoretical Framework.....	28
II.4. Conceptual Framework.....	29
II.5. Hypothesis .....	29
CHAPTER III.....	30
III.1. Research Design .....	30
III.2. Time and study settings .....	30
III.3. Variables.....	30
III.3.1. Independent variable.....	30
III.3.2. Dependent Variable .....	30
III.3.3. Control Variable .....	31
III.4. Operational Definition.....	31
III.4.1. Transient global brain Ischemia.....	31
III.4.2. Vitamin D supplementation.....	31
III.4.3. Spatial memory function assessment.....	31
III.4.4. mRNA expression of NeuN.....	32
III.5. Study Subjects .....	32
III.6. Equipment and Materials.....	33
III.7. Study Procedure.....	36
III.7.1. Preparation of study subjects .....	36

III.7.2. Transient global cerebral ischemia injury rat model .....	36
III.7.3. Vitamin D supplementation .....	37
III.7.4. Spatial memory function assessment.....	38
III.7.5. Termination and tissue extraction .....	40
III.7.6. RNA extraction .....	41
III.7.7. cDNA synthesis .....	42
III.7.8. Reverse-Transcriptase Polymerase Chain Reaction (RT-PCR).....	42
III.8. Data Analysis.....	43
CHAPTER IV .....	45
IV.1. Research Result .....	45
IV.1.1. Spatial Memory Function .....	45
IV.1.2. The mRNA expression of NeuN .....	49
IV.2. Discussion .....	50
CHAPTER V.....	55
V.1. Conclusion .....	55
V.2. Recommendation .....	55
REFERENCES.....	56
APPENDICES.....	61