

Index

LIST OF ACRONYMS:	2
LIST OF CONTENTS	3
INDEX.....	4
SUMMARY	5
RESUMEN.....	7
RESUM.....	9
INTRODUCTION	12
Spinal cord injury:.....	12
Introduction to Spinal Cord Injury.....	12
Main causes of SCI.....	12
Pathophysiology of SCI: temporal stages	12
Clinical Management of SCI patients.....	14
Spinal cord injury Research	15
CNS anatomy and function	16
The process of walking	16
Principles on spinal cord anatomy	16
Spinal pathways: Ascending and Descending	17
CNS reorganization upon injury	22
Brain plasticity	23
Spinal cord plasticity	24
Maladaptive plasticity	25
Treatments for spinal cord injury: from basic to clinical research.....	26
Overview of the main therapeutical approaches	26
NPCs transplantation	27
cAMP as a master regulator of CNS repair	28
cAMP therapies in SCI	28
Novel tools for cAMP manipulations	31
HYPOTHESIS AND OBJETIVES	34
RESULTS	38
CHAPTER 1: NPC transplantation rescues sci-driven cAMP/EPAC2 alterations, leading to neuroprotection and microglial modulation	38
CHAPTER 2: Stimulation of corticospinal neurons by optogenetic cAMP inductions promotes motor recovery via raphespinal tract modulation	78
DISCUSSION	116
CONCLUSIONS	124