## PREFACE

The research work of the thesis entitled "Evaluation of some mitochondrial modulators in the treatment of neonatal anoxia" is based on the identification of a novel mitochondrial-targeted mechanism through which the cortical neuronal cell death progresses in developing brain can be prevented. Moreover, by preserving the mitochondrial function on certain time points may be helpful in improving neurobehavioral outcomes in newborns. The whole work has compiled into eight chapters: **Chapter 1** introduces the topic and its importance. **Chapter 2** investigates the temporal dynamics of mitochondrial bioenergetics after anoxia in rat pups (neonates). **Chapter 3** evaluates mitochondrial dysfunction linked progression of insult and transition of cell death after anoxia. **Chapter 4** investigates the clinical basis of mitochondrial-linked apoptotic markers in the cerebrospinal fluid of anoxic neonates. **Chapter 5** investigates the role of 2,4 dinitrophenol (2,4 DNP) on anoxia-induced mitochondrial dysfunction linked insult progression. **Chapter 6** investigates the role of tempol on anoxia-induced mitochondrial dysfunction induced insult progression. **Chapter 7** describes the combined effect of mitochondrial modulators (2,4 DNP and tempol) for any synergistic or additive effect in the treatment of anoxia-induced synaptic and non-synaptic mitochondrial dysfunction and neurobehavioral alterations from day-21 up to day-150. **Chapter 8** summarizes the study with its important outcomes. It also discusses the future perspective of the work and its potential benefits for science and humanity.