OBJECTIVES OF THE PRESENT STUDY

1. To induce Temporal lobe epilepsy model in rats using I.P administration of pilocarpine

2. To study anti-epileptic activity of *Withania somnifera* and Withanolide A

3. To investigate the behavioural changes in control and experimental rats using Radial arm maze test, Y maze test, Rotorod test, Grid walk test and Narrow beam test in experimental rats

4. To study neuronal viability using Nissl staining and TOPRO-3 staining in brain sections of control and experimental rats

5. To study antioxidant potential of *Withania somnifera*, Withanolide-A and Carbamazepine using TBARS Assay, SOD Assay, CAT Assay, SOD Gene Expression and GPx Gene Expression in the brain regions – hippocampus, cerebral cortex, cerebellum and brain stem of control and experimental rats

6. To measure glutamate content in the brain regions – hippocampus, cerebral cortex, cerebellum and brain stem of control and experimental rats

7. To study the synthesis, transport and metabolism of Glutamate using GDH assay, GLAST expression and GAD expression in the in the brain regions – hippocampus, cerebral cortex, cerebellum and brain stem of control and experimental rats

8. To study AMPA and NMDA receptors binding parameters in the brain regions – hippocampus, cerebral cortex, cerebellum and brain stem of control and experimental rats

9. To study NMDA and AMPA receptor subunits expression in the brain regions – hippocampus, cerebral cortex, cerebellum and brain stem of control and experimental rats using Real-Time PCR.

10. To measure the second messenger IP3 levels in the brain regions – hippocampus, cerebral cortex, cerebellum and brain stem of control and experimental rats
11. To study the localisation and expression status of NMDA R1, NMDA 2B, AMPA (GluR2) receptor subunits by immunofluorescent specific antibodies in the brain slices of control and experimental rats using Confocal microscope.

12. To study activation of anti-apoptotic pathway using Akt, Bax and Caspase 8 gene expression in the brain regions – hippocampus, cerebral cortex, cerebellum and brain stem of control and experimental rats using Real-Time PCR.

13. To study localisation and expression of Phospho- Akt by specific immunofluorescent antibody in hippocampus of control and experimental rats using confocal microscope.