

Experimental Autoimmune Encephalomyelitis (EAE) Model for Multiple Sclerosis

Multiple sclerosis (MS) is the major demyelinating disease in humans. Autoreactive immune cells recognize the myelin sheath and axon as foreign. The infiltrating immune cells trigger episodes of damage and regeneration to the myelin sheath and nerve axon. Clinical symptoms of neurological dysfunction are concomitant with pathology.

Key Points in Rodents:

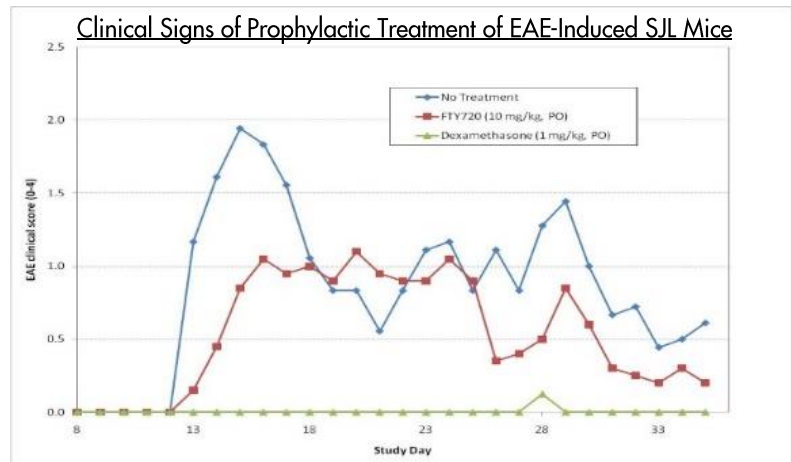
Mice and rats are the two most commonly used animal models of EAE, in addition to NHPs. EAE is greatly influenced by several factors including: gender, strain (MHC haplotype), and age. In rats, EAE is typically monophasic while mice exhibit chronic or relapsing disease, pending on the mouse strains and the induction material. Induction with myelin-oligodendrocyte-glycoprotein (MOG) in C57BL mice resulted with chronic EAE while proteo-lipoprotein (PLP) in SJL mice resulted with relapsing EAE. The severity of actively induced disease is correlated with strain MHC haplotype and encephalitogenic peptide sequence.

Treatments Options:

- Prophylactic
- Therapeutic at peak of disease
- Therapeutic at remission phase

Disease Evaluation

- Clinical Scoring System of mice (0 - 4):
- Body weight
- Relapse Rate
- Histopathology
- Flow Cytometry
- ELISA

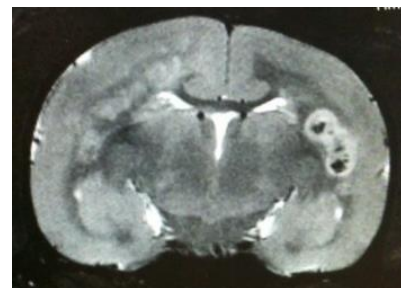


Key Points in Non-Human Primates (NHPs):

The common marmoset is susceptible to a form of EAE that resembles MS in human. The common marmoset is a unique model for evaluating potential MS treatment because of the molecular and functional similarity of its immune system to humans. The topography of lesions in the marmoset brain, which are remarkably similar to the human MS pattern, can be identified using diagnostic tools used in humans, including MRI.

Clinical scoring in NHPs (0 – 5):

- 0 = no clinical signs
- .5 = apathy, loss of appetite, vomiting, altered walking without ataxia
- 1 = lethargy, anorexia, tail paralysis, tremor
- 2 = ataxia, optic disease (vision problems)
- 2.5 = incomplete paralysis of one of both sides, sensory loss, brainstem syndrome
- 3 = complete paralysis of one or two sides
- 4 = complete paralysis
- 5 = moribund or spontaneous death attributable to EAE



MRI of brain lesions in marmoset model of EAE