

# ELECTROPHYSIOLOGICAL-PATHOLOGIC CORRELATIONS IN MURINE EXPERIMENTAL AUTOIMMUNE NEURITIS

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## ABSTRACT

**INTRODUCTION:** Severe murine experimental autoimmune neuritis (sm-EAN) is an animal model of Guillain-Barré syndrome (GBS). There is little published electrophysiological data in its regard, and it remains unknown whether or not these parameters correlate with neuromuscular severity scores. Further characterization of the inflammatory process is needed.

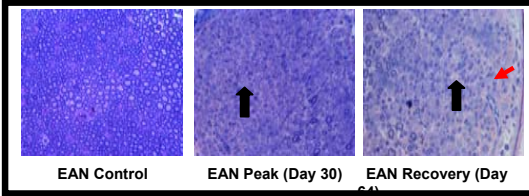
**OBJECTIVES:** To ascertain electrophysiological hallmarks of sm-EAN, determine their correlation with neuromuscular severity, and characterize the inflammatory infiltrates.

**METHODS:** Sm-EAN was induced in 8 to 12-week-old female SJL/J mice as previously published, with appropriate controls. Motor nerve conduction studies (MNCSS) of the right dorsal caudal tail (DCT) and bilateral sciatic nerves were performed on days 10, 30, 37, and 62 post induction (Pi). Sciatic nerves were harvested for pathologic investigation, including proinflammatory chemokine ligand/receptor expression using polymerase chain reaction.

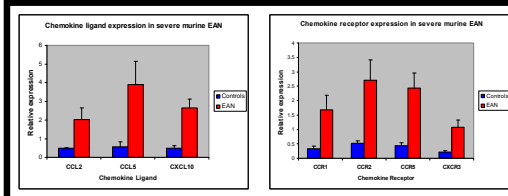
**RESULTS:** Disease onset occurred at 9 to 13 days, with maximal severity 26 to 32 days following injection, and mild residual weakness occurring at less than 2 months Pi. MNCSS showed statistically significant reductions in mean compound motor action potential (CMAP) amplitudes and conduction velocities as well as increases in mean CMAP durations in both nerves as compared to control subjects. Regression analyses demonstrated correlations ( $r^2=0.78-0.99$ ) between neuromuscular severity scores and the above parameters, with stronger correlations seen with the DCT nerve. Severe multifocal or diffuse demyelination with some mild axonal loss was observed at peak severity, associated with mononuclear cell infiltrates (F4/80+ macrophages, CD3+ CD4+ T-cells and CD19+ B-cells). There was increased expression of CCL2-CCR2, CCL5-CCR1, CCR5 and CXCL10-CXCR3 at peak severity. Residual infiltrates and rudimentary 'onion bulb' formation were seen during the recovery phase.

**CONCLUSIONS:** The clinical, electrophysiological, and pathologic features of sm-EAN mimic GBS significantly

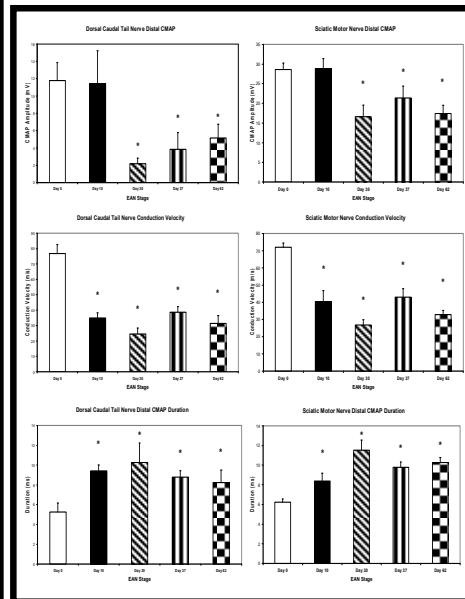
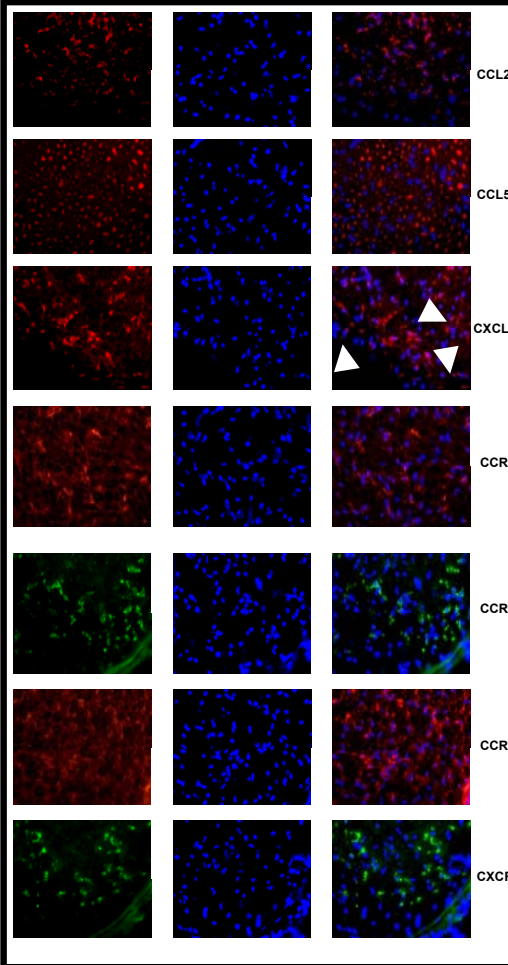
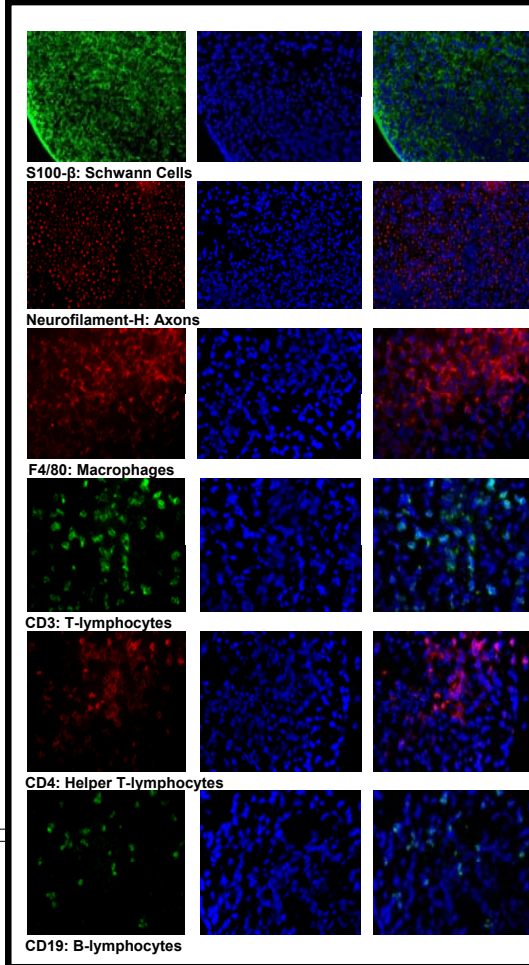
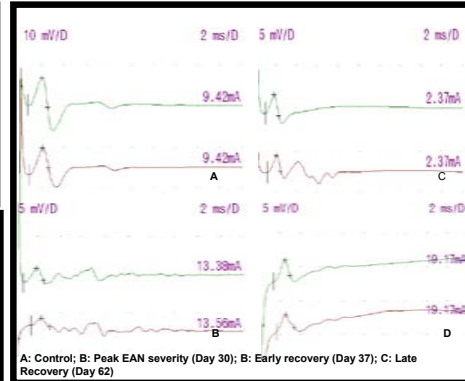
### HISTOPATHOLOGICAL FEATURES OF SM-EAN



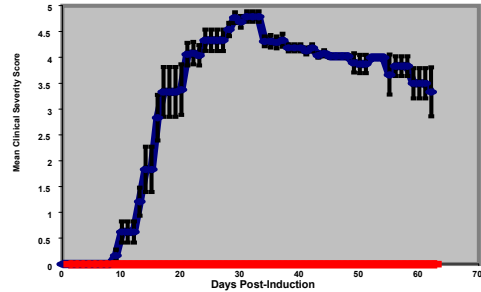
### CHEMOKINE LIGAND/RECEPTOR EXPRESSION IN SM-EAN



### DORSAL CAUDAL TAIL NERVE ELECTROPHYSIOLOGY



Natural History Curve: BPNM-Induced EAN in female SJL/J mice



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