Med12 is a novel regulator of peripheral myelin maintenance

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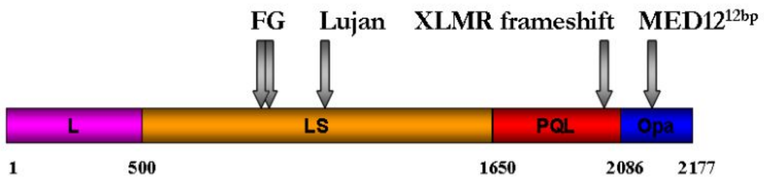
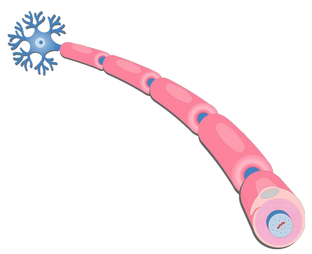
Background



- Med12 is a subunit of the general transcriptional mediator complex
  - Mutations of the protein cause various diseases including FG Syndrome and Lujan-Fryns Syndrome
- All of the diseases listed above cause myelin abnormalities, often demyelination



- The myelin sheath is the protective, lipid-rich layer surrounding axons
- The loss or degradation of myelin is accredited to the development of many neurodegenerative diseases in humans

Prior Med12 Research

- No research has been done before in postnatal developing mice to truly understand the extent Med12 has on the nervous system and myelination
- This is a unique body of work to explore that topic for the first time using this model

Our Research Objectives

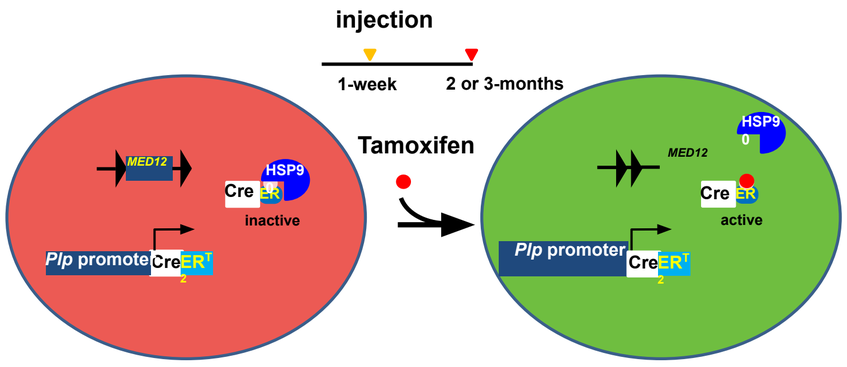
The main objective of this study, is to uncover to what extent, if any, the loss of Med12 has on the loss of myelin stability in adult mice.

Methods

- A previously generated Cre-lox recombination system was generated in the lab and used to carry out this study, depicted below

Plp-CreER^{T2} Med$^{L/L}$ OR Plp-CreER^{T2} Med$^{+/+}$

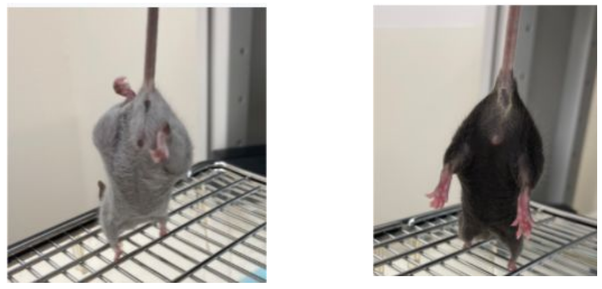
Plp-CreER^{T2};Med12 $^{+/+}$ or Plp-CreER^{T2};Med12 $^{L/L}$



- To test the physical capabilities of the mice, an inverted cage lid strength test was performed
- Staining for immunofluorescence was performed on the corpus callosum and sciatic nerve, using fluoromyelin and MBP, myelin basic protein, along with other antibodies

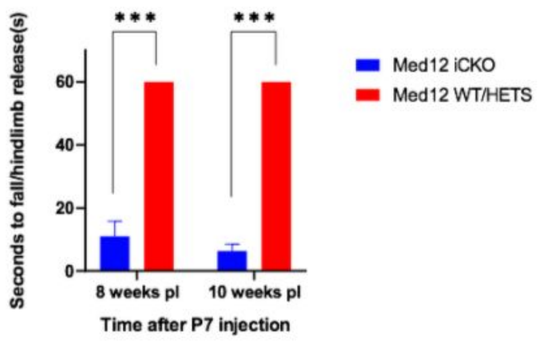
Results

Phenotype

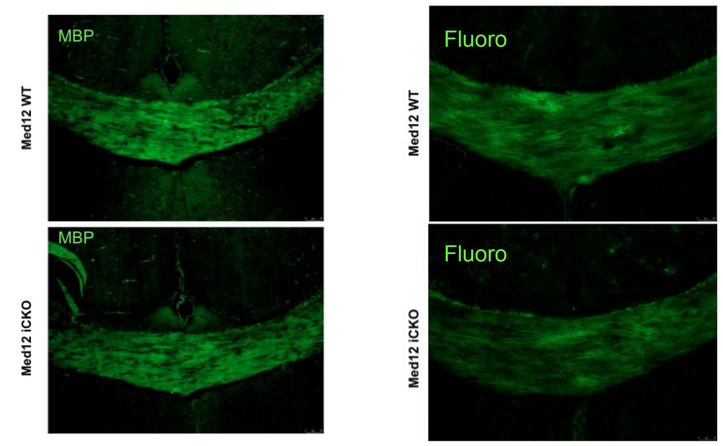


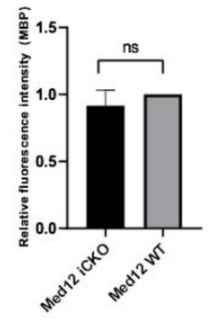
Med12 iCKO | Med12 WT

Performance

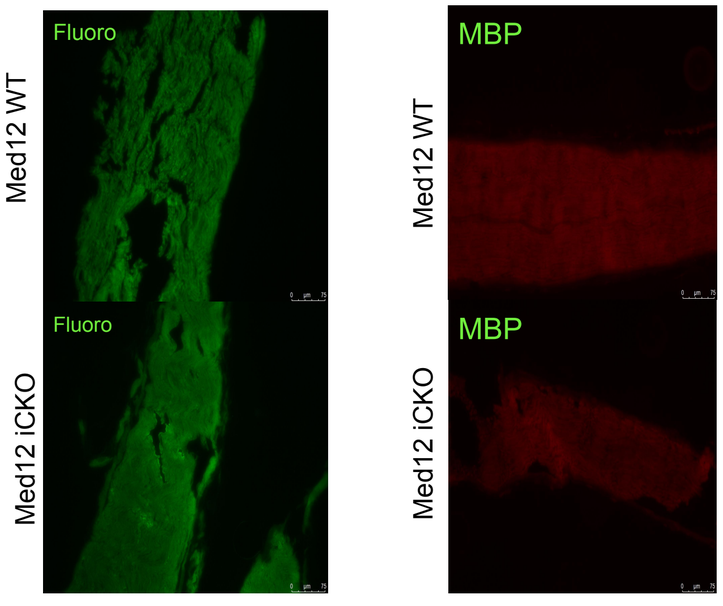


- The CNS did not show severe myelin loss





- The PNS did not show differences in the myelin composition



Conclusion

At this point in the research, there is not enough data to make any concrete conclusions regarding the role of Med12 on myelination.

Future steps for this study include neural conduction assays to measure the velocity/speed of electrical signals and electron microscopy experiments to directly analyze myelin ultrastructure.