

**Supplemental Figure 1 Pou3f1 overexpression in Schwann cells of condPou3f1:MPZ(Cre) mice.**

(A) Immunohistochemistry using an anti-Pou3f1 antibody shows expression of the transgene only in sciatic nerve from condPou3f1:MPZ(Cre) sciatic nerve compared to control at 4-months of age (scale bar, 100  $\mu$ m).

(B) Immunohistochemistry using an anti-Pou3f1 antibody of P14 dorsal root ganglia (DRG) from control and condPou3f1:MPZ(Cre) mice shows that Pou3f1 is only expressed in the glial cells of the DRG and not in the DRG neuronal cell bodies (arrows). Photographs are overexposed to illustrate DRG neurons. This data supports the conclusion that overexpression of Pou3f1 in Schwann cells and not DRG neurons is responsible for the Pou3f1 phenotype (scale bar, 60  $\mu$ m).

(C) Immunohistochemistry using an anti-HA antibody to detect exogenously expressed Pou3f1 in sciatic nerve of condPou3f1:MPZ(Cre) mice compared to control nerve (scale bar, 60  $\mu$ m).

(D) qRT-PCR shows a 15-fold increase in Pou3f1 expression in the condPou3f1:MPZ(Cre) (n=3) sciatic nerve compared to control (n=2). Values shown are mean  $\pm$  SEM ( $p=0.03$ ).

**Supplemental Figure 2 Hypomyelination of condPou3f1:MPZ(Cre) sciatic and femoral motor and sensory nerves.**

Gross examination of 6-month old wild type (A) and condPou3f1:MPZ(Cre) (B) sciatic nerves revealed that the mutant nerves are thinner and less opaque, consistent with a hypomyelination phenotype.

(C) Electron micrographs of *condPou3f1:MPZ(Cre)* sciatic nerves at P28, 4-month and 10-month old showing hypomyelination compared to control nerves (scale bar, 10  $\mu\text{m}$ ).

(D) One micron thick paraffin sections from *condPou3f1:MPZ(Cre)* mice shows equivalent hypomyelination of the motor versus sensory branch of the femoral nerve (scale bar, 20  $\mu\text{m}$ ).