

## Description of Additional Supplementary Files

Title: Supplementary Movie 1

Description: Intravital imaging of cortical OL in adult mouse. Representative area of the somatosensory cortex (layer 1), prior to single OL cell ablation in a Plp:GFP mouse, where internode morphology, OL processes and nodes of Ranvier are clearly identifiable. The imaged volume spans 60  $\mu\text{m}$  in z and 203  $\mu\text{m}$  in x/y (2.4  $10^6 \mu\text{m}^3$  ) and exceeds the typical cylindrical volume of a cortical oligodendrocyte in our sample ( $\sim 0.7 \cdot 10^6 \mu\text{m}^3$  ).