**SUPPLEMENTAL MATERIALS AND METHODS**

**Image analysis of oligodendrocyte processes**

4-5 images from non-overlapping regions from each coverslip were taken for analysis and each group consisted at least three coverslips. Images were first converted to 8-bit grayscale and subjected to background correction using the command Process › Subtract background and using a rolling ball algorithm (sliding paraboloid) (1). The radius was set to at least the size of the largest object that was not part of the background (~50 square pixels) followed by applying median filter (radius ~2 pixels, to remove “salt and pepper” noise) and adjusting the brightness contrast. These images were further scanned for optimal threshold selection (min 0, max 78) (optimal threshold was selected for each image to exclude bias resulting from different image threshold values in different images) and sharpened using “process › sharpen” command in the Fiji software (ImageJ, NIH). After a careful observation of each image manually, Neurophology J plugin (2) was run to quantify oligodendrocyte processes with following changes in the original script:

run("Subtract Background...", "rolling=50"); - this command line was omitted since it was performed before running the plugin.

Value changes

lowc=getNumber(19);

lowi=getNumber(245);

nwidth=getNumber(6);

cleanup=getNumber(15);

**SUPPLEMENTAL REFERENCES**

1. Mehra RD, Sharma K, Nyakas C, Vij U. Estrogen receptor alpha and beta immunoreactive neurons in normal adult and aged female rat hippocampus: a qualitative and quantitative study. Brain research. 2005;1056(1):22-35.

2. Ho S-Y, Chao C-Y, Huang H-L, Chiu T-W, Charoenkwan P, Hwang E. NeurphologyJ: an automatic neuronal morphology quantification method and its application in pharmacological discovery. BMC Bioinformatics. 2011;12:230-.