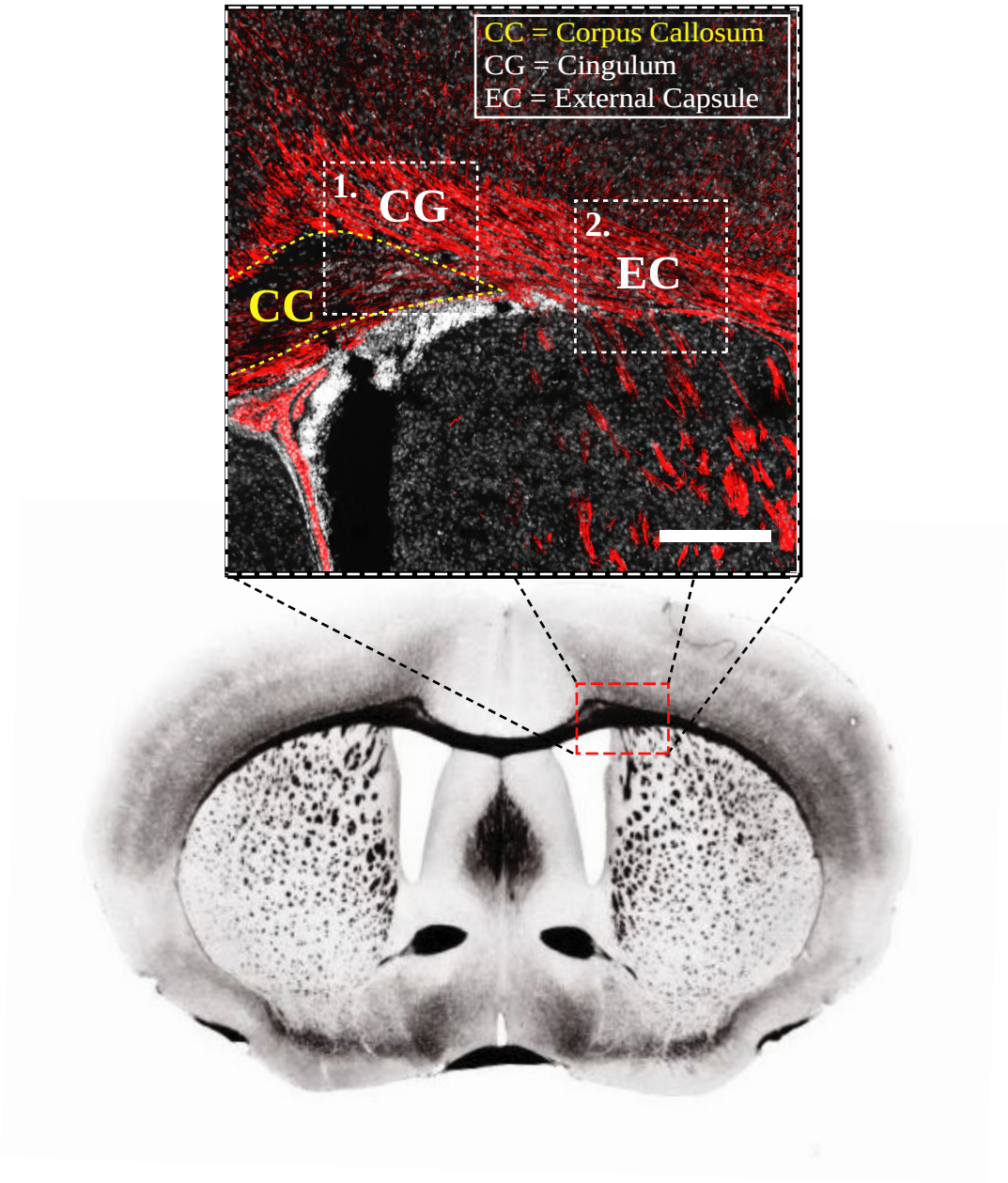
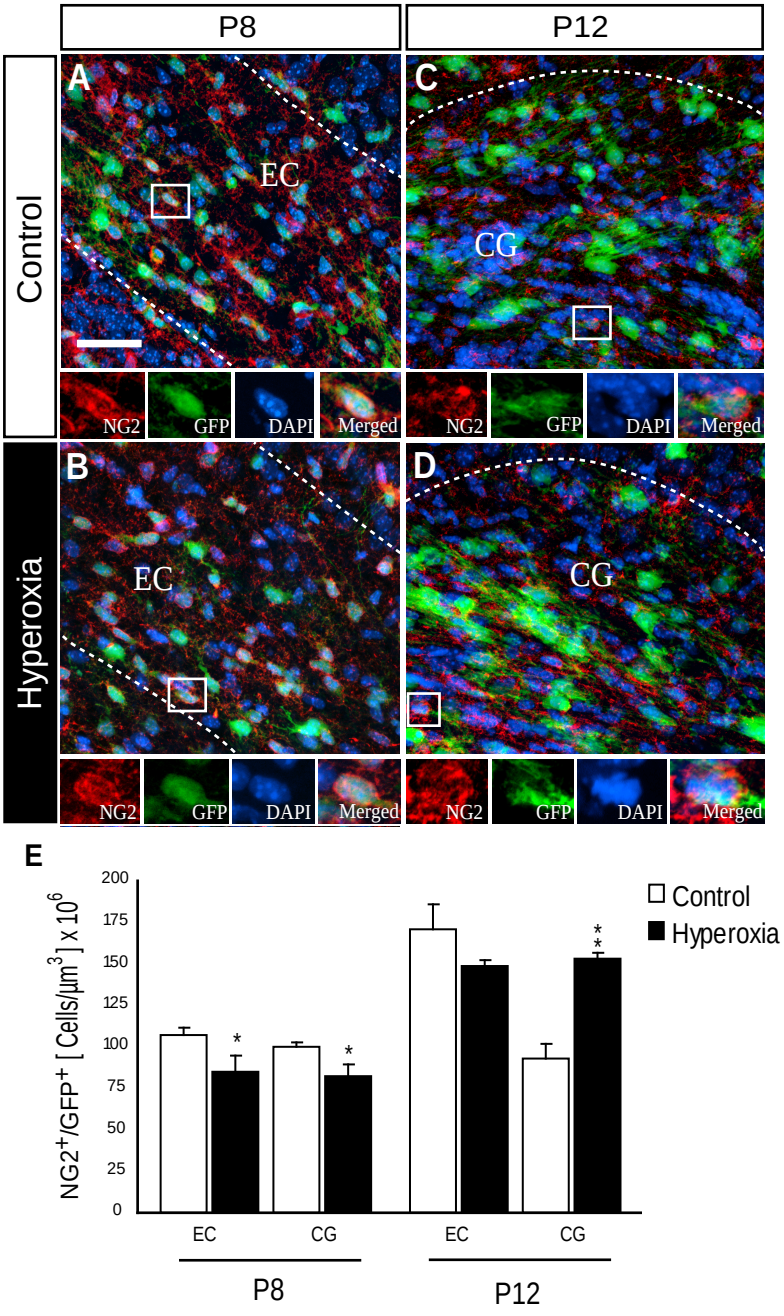
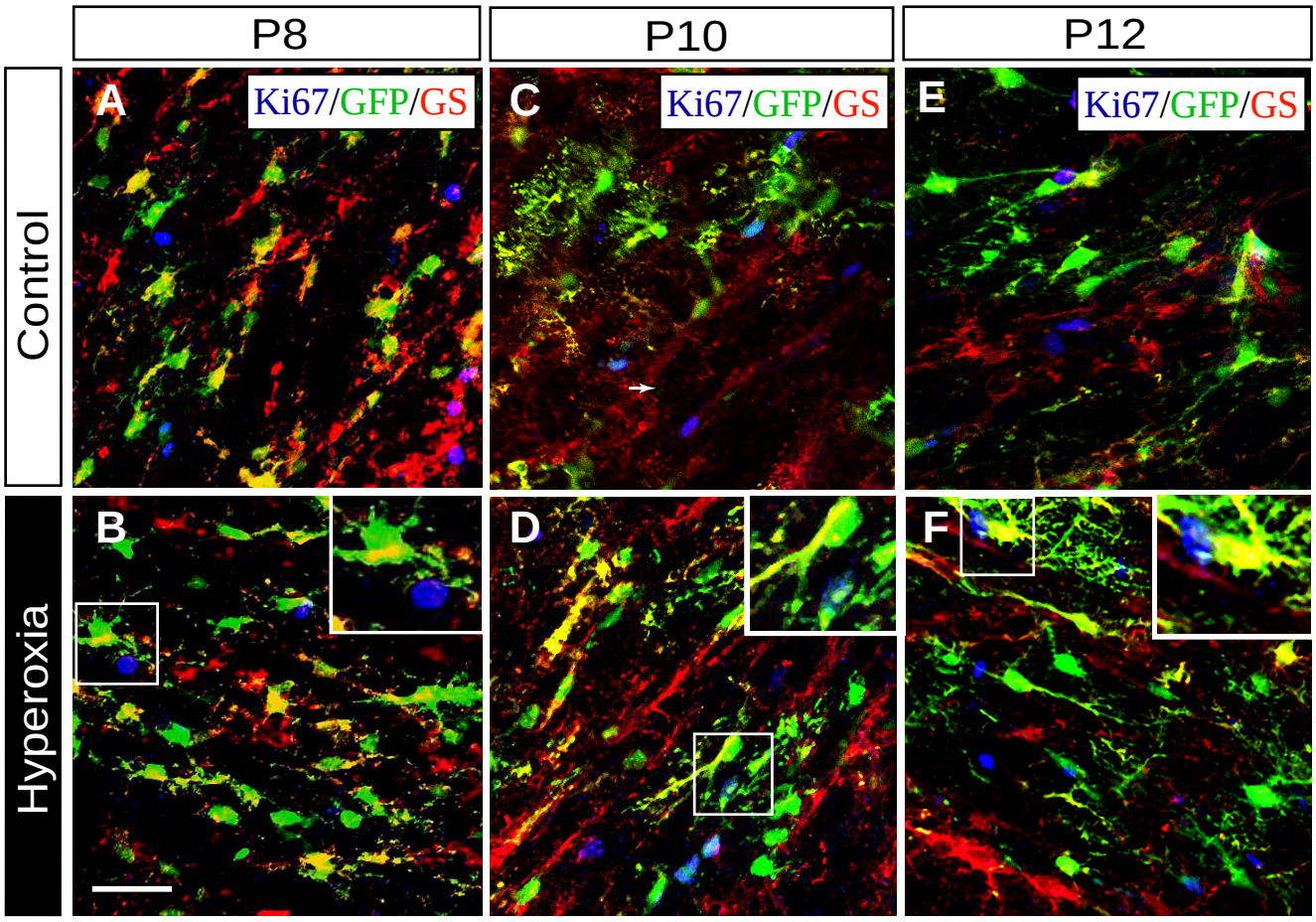
Supplemental Figure 1



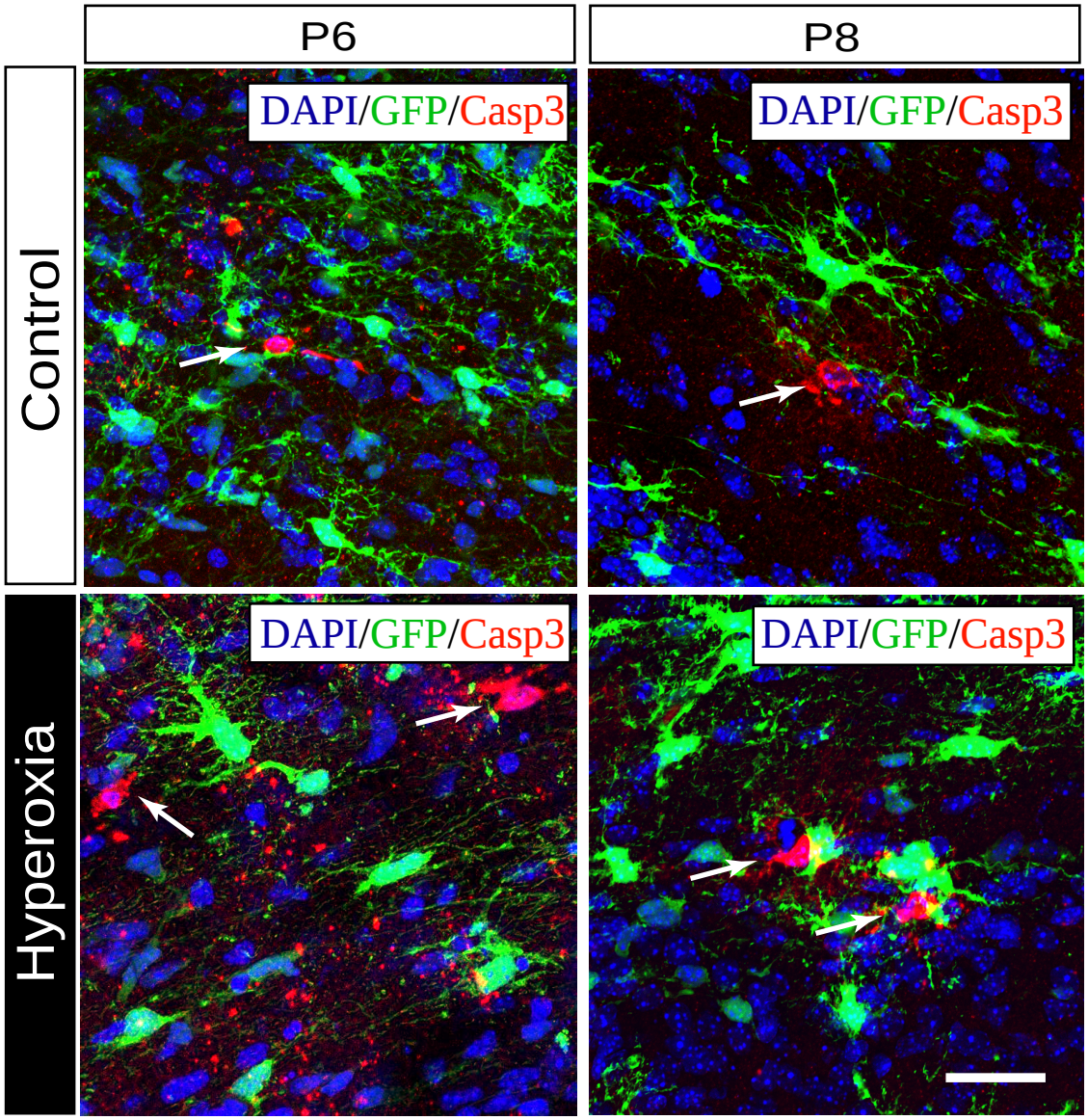
Supplemental Figure 2



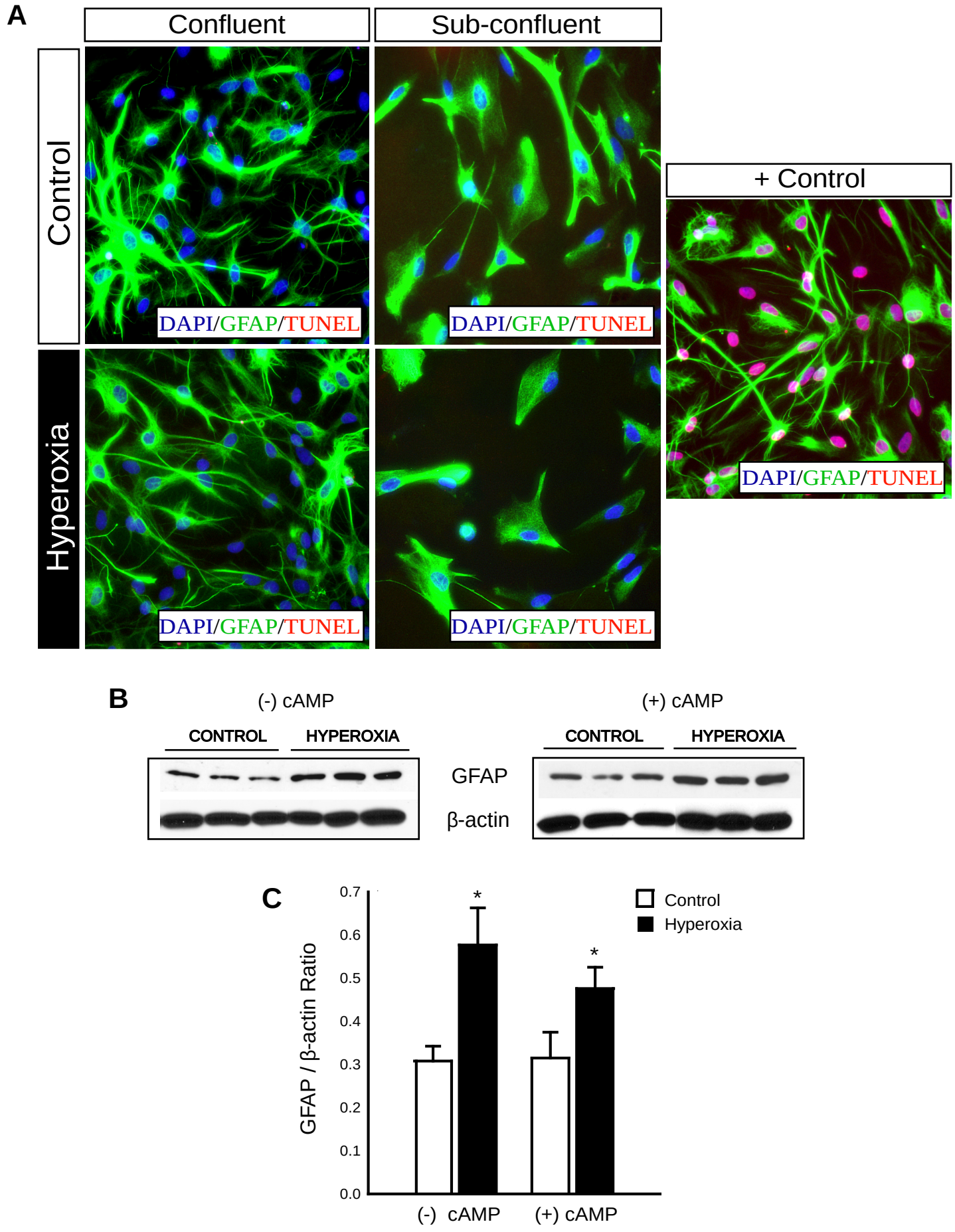
Supplemental Figure 3



Supplemental Figure 4



Supplemental Figure 5



Supplemental Figure 1: White matter regions of interest. 40X image of the WM at P15, showing the two main regions of interest, 1) CG = cingulum and 2) EC = external capsule. The CG region included a large portion of the corpus callosum (CC) and was located directly above the subventricular zone (SVZ). Scale bar = 50 μm.

Supplemental Figure 2: Changes in $NG2^+$ progenitor cell numbers in CNP-EGFP mice after hyperoxia. (**A-D**) Confocal images of $NG2^+$ progenitors in P8 and P12 CNP-EGFP mice under control conditions or after hyperoxia. Scale bar = 50 μm. (**E**) The total number of $NG2^+$ cells is decreased at P8 in the external capsule (EC) and in the cingulum (CG), and increased in the CG after 4 days of recovery at room air at P12. Data are shown as mean ± SD (n = 3-5 brains for each group). Unpaired t-test comparing control vs. hyperoxia was used for statistical analysis. $*P < 0.05$, $**P < 0.025$.

Supplemental Figure 3: Hyperoxia does not alter astrocyte proliferation in the developing white matter. (**A-F**) Immunostaining for glutamine synthetase (GS) and Ki67 in GFAP-EGFP transgenic mice at P8, P10 and P12. No $Ki67^+GFP^+GS^+$ immunostaining was detectable at any time point in either experimental group (hyperoxia vs. control). Scale bar = 50 μm.

Supplemental Figure 4: Immunofluorescence staining for cleaved caspase3-α in GFAP-EGFP transgenic mice. Confocal images from GFAP-EGFP transgenic mice following hyperoxia for 6 hours (P6) and 48 hours (P8) vs. litter-matched controls. Staining for cleaved caspase3-α is not detectable in $EGFP^+$ astrocytes of the white matter at either time point. Scale bar = 50 μm.

Supplemental Figure 5: Hyperoxia does not cause cell death, but upregulates GFAP levels in cultured astrocytes. (**A**) Cell death was assayed by immunocytochemistry for TUNEL in astrocytes following hyperoxia compared to controls. In confluent astrocyte cultures treated with cAMP, $TUNEL^+$ cells (red) are very rarely detectable under normoxia or hyperoxia, and in sub-confluent cultures no $TUNEL^+$ cells are visible under both conditions. In the positive control (+ Control = cells treated with DNase), the vast

majority of cells are $TUNEL^+$. Scale bar = 50 μm. (**B**) Confluent astrocyte cultures were exposed to 72 hours of hyperoxia in the presence (+) cAMP or absence (-) cAMP of 50 uM db-cAMP (cAMP). GFAP protein levels in cultured astrocytes were analyzed by Western blotting. A representative experiment is shown. (**C**) Densitometric analysis reveals an increase in GFAP following hyperoxia. Values represent means of 3 independent experiments $\pm$ SEM. $*P < 0.05$ (unpaired student's t-test vs. control).