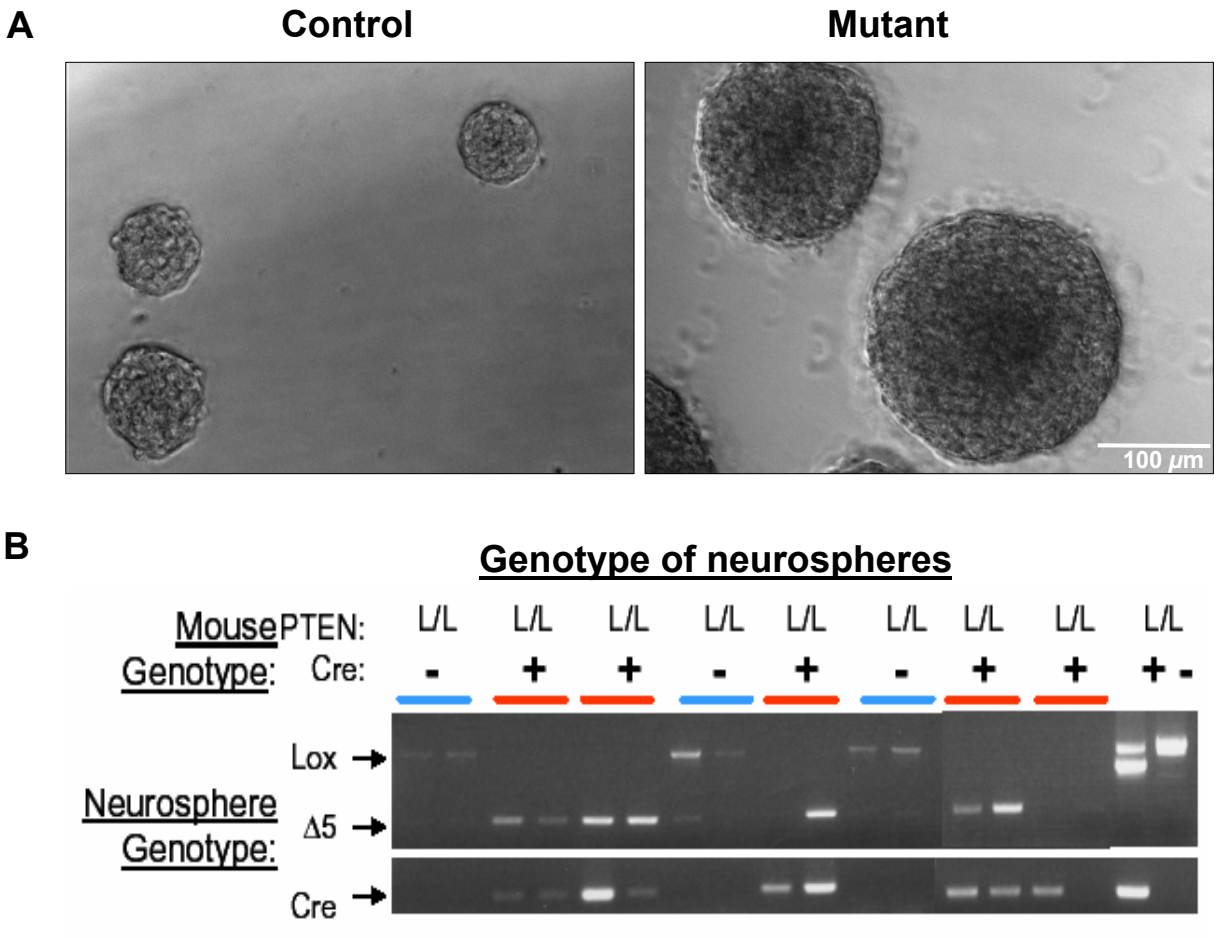
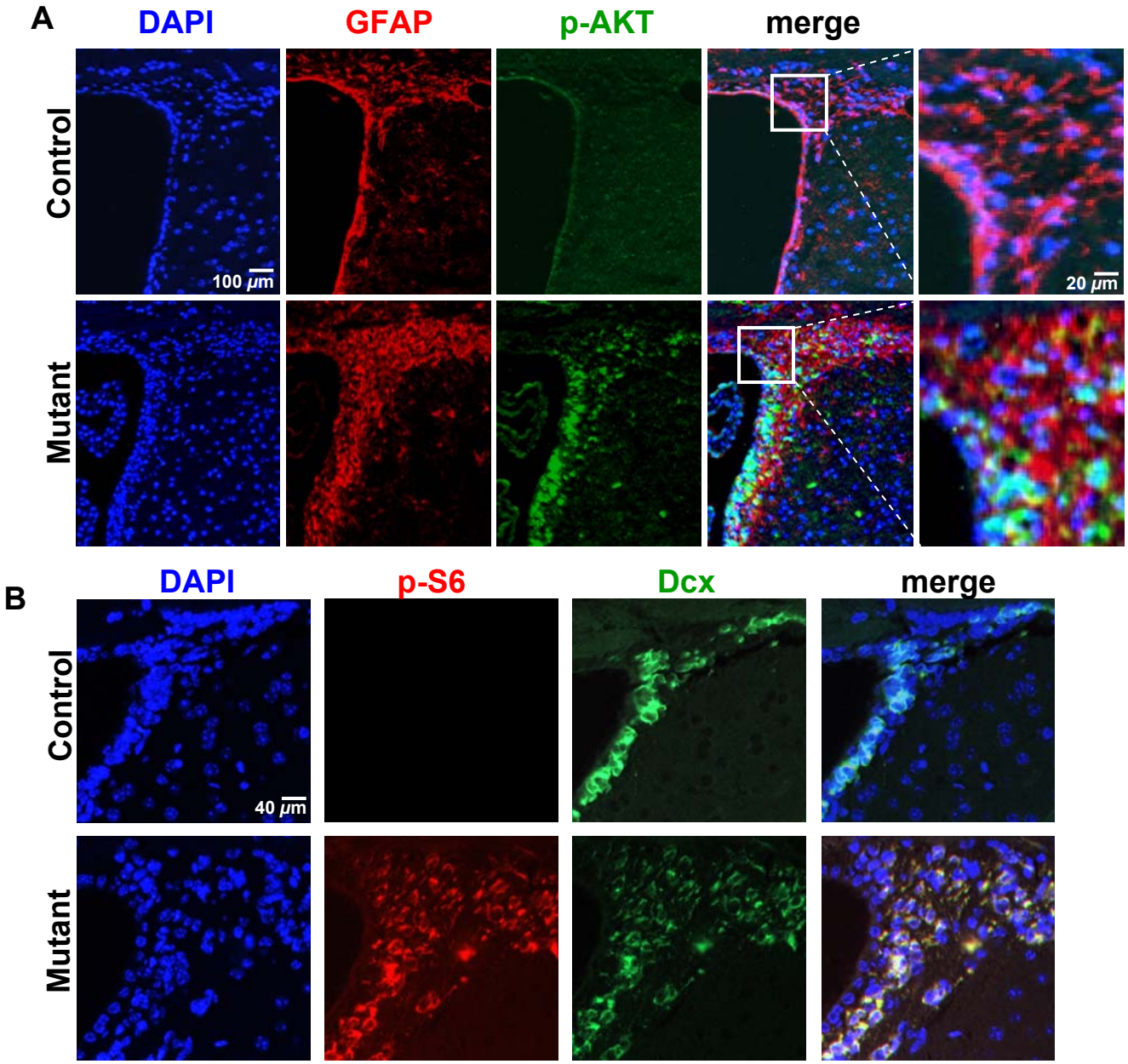
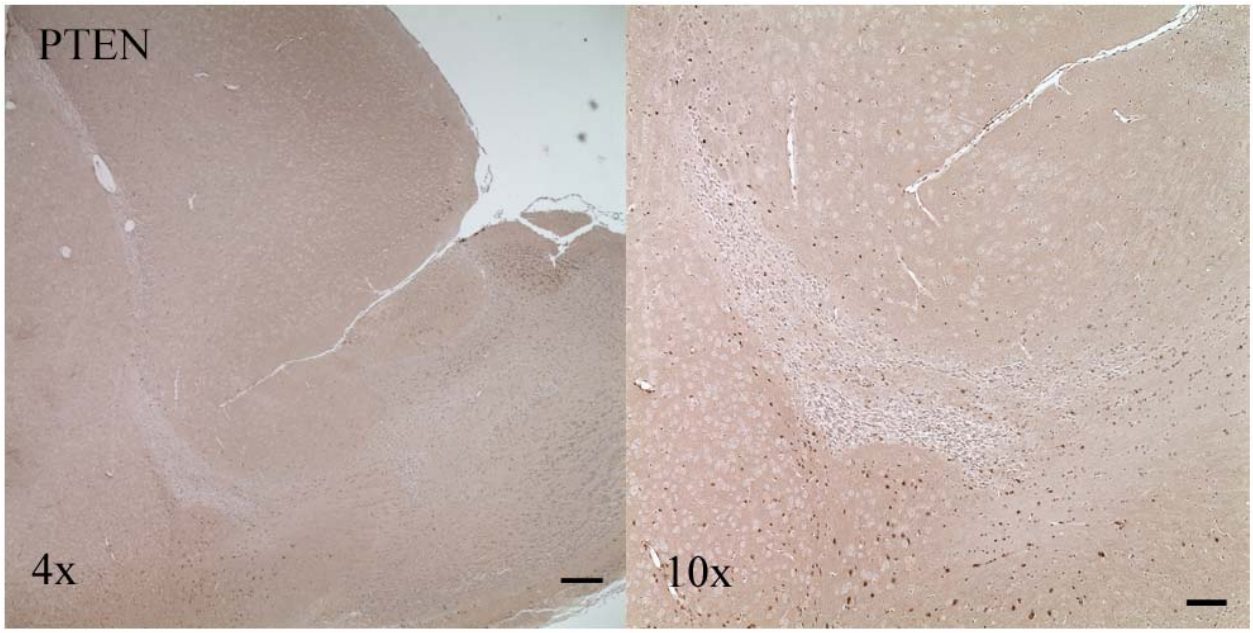


Supplementary Figure 1. *Pten* null neurospheres are larger than control.

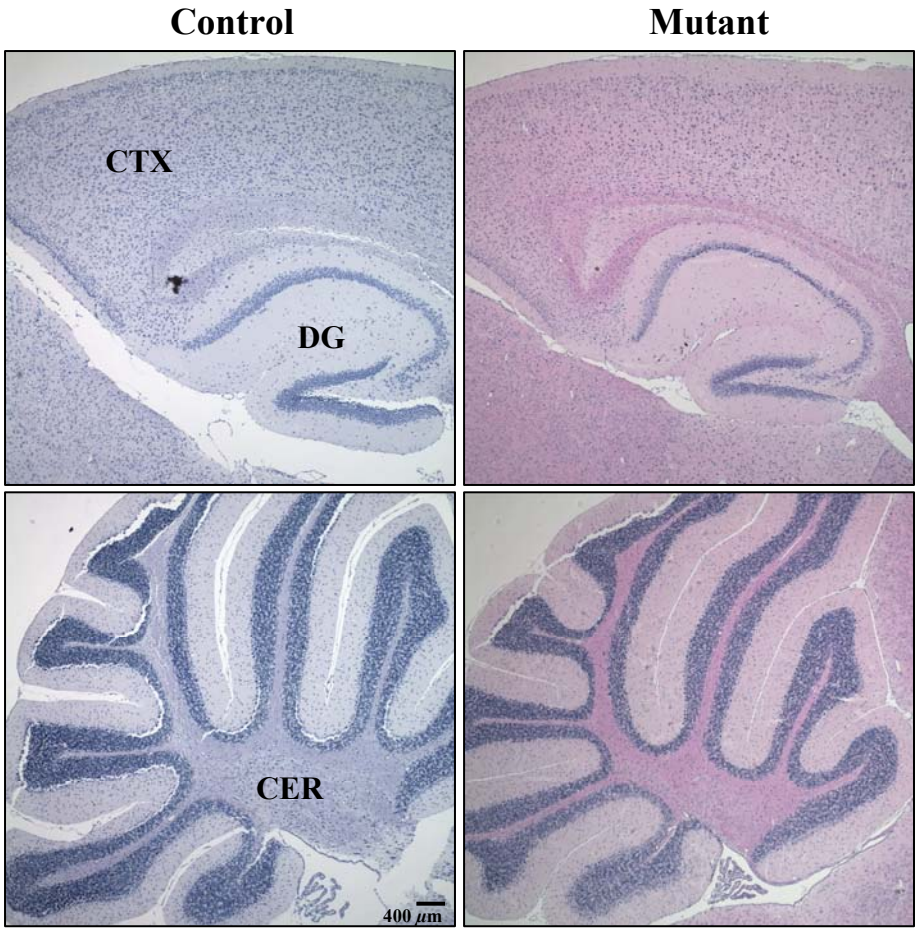
(A) Representative set of neurospheres from control and mutant animals are shown to demonstrate the dramatic size difference. (B) Genotyping of neurospheres was performed by PCR on DNA isolated from individual single neurospheres to demonstrate their clonality and Cre excision of the loxP band as shown by the Δ5 fragment. Each sphere was subjected to both Cre and Pten PCR genotyping reactions.



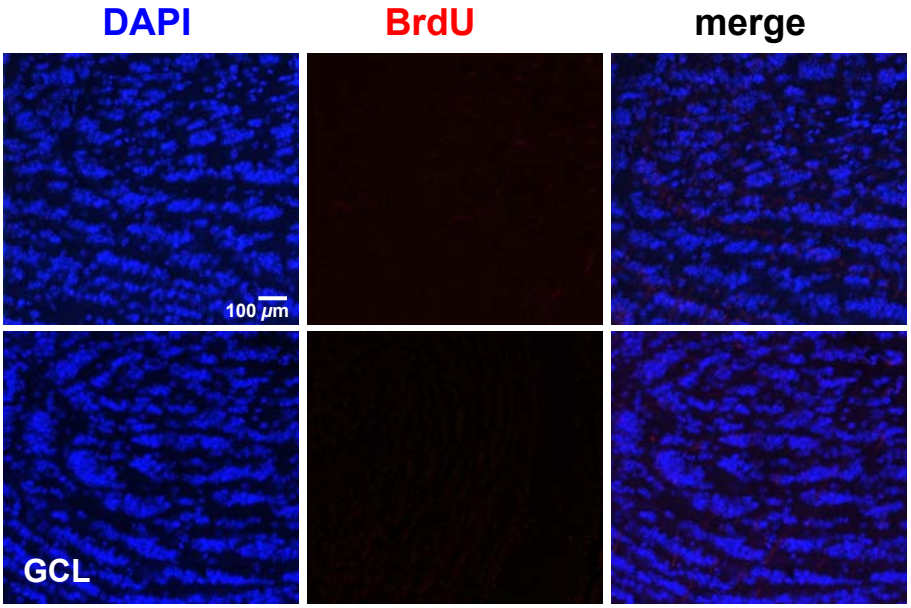
Supplementary Figure 2. *Pten* deletion in adult NSCs leads to PI3K/AKT pathway activation in SEZ.
Compared with littermate controls, mutant mice showed increased GFAP and P-AKT (A) and DCX and P-S6 (B) expression and colocalization in the SEZ. DAPI is used as counter stain to visualize nuclei.



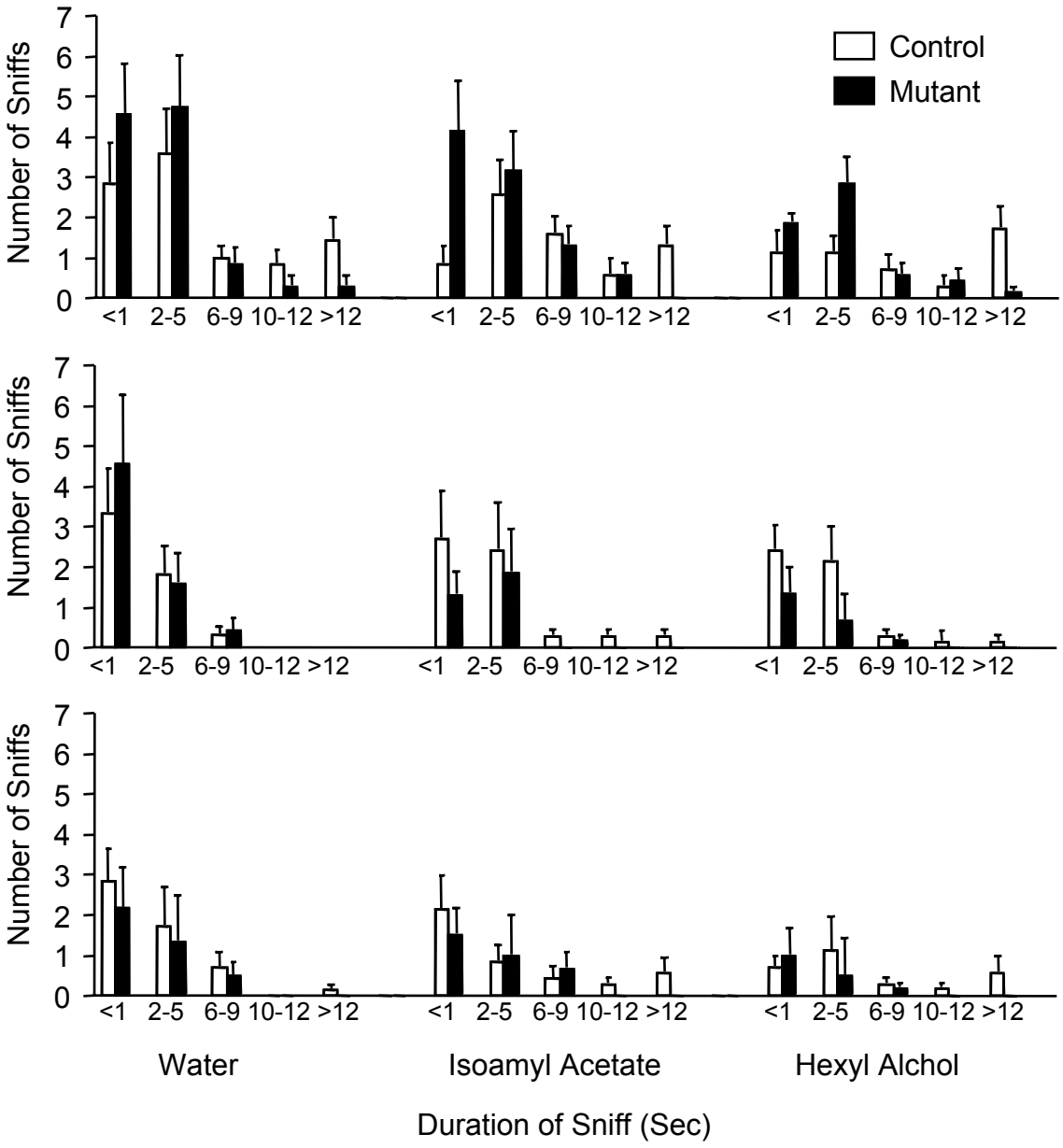
Supplementary Figure 3. Decreased *Pten* expression in mutant RMS.
Representative images of mutant brain shows decreased *Pten* expression in mutant RMS. DAPI is used as counterstain to visualize nuclei. CTX, cortex.



Supplementary Figure 4. Normal histoarchitecture in mutant brain. Representative images of H&E stains of comparable regions of control and mutant brain. CTX, cortex; DG, dentate gyrus; CER, cerebellum.

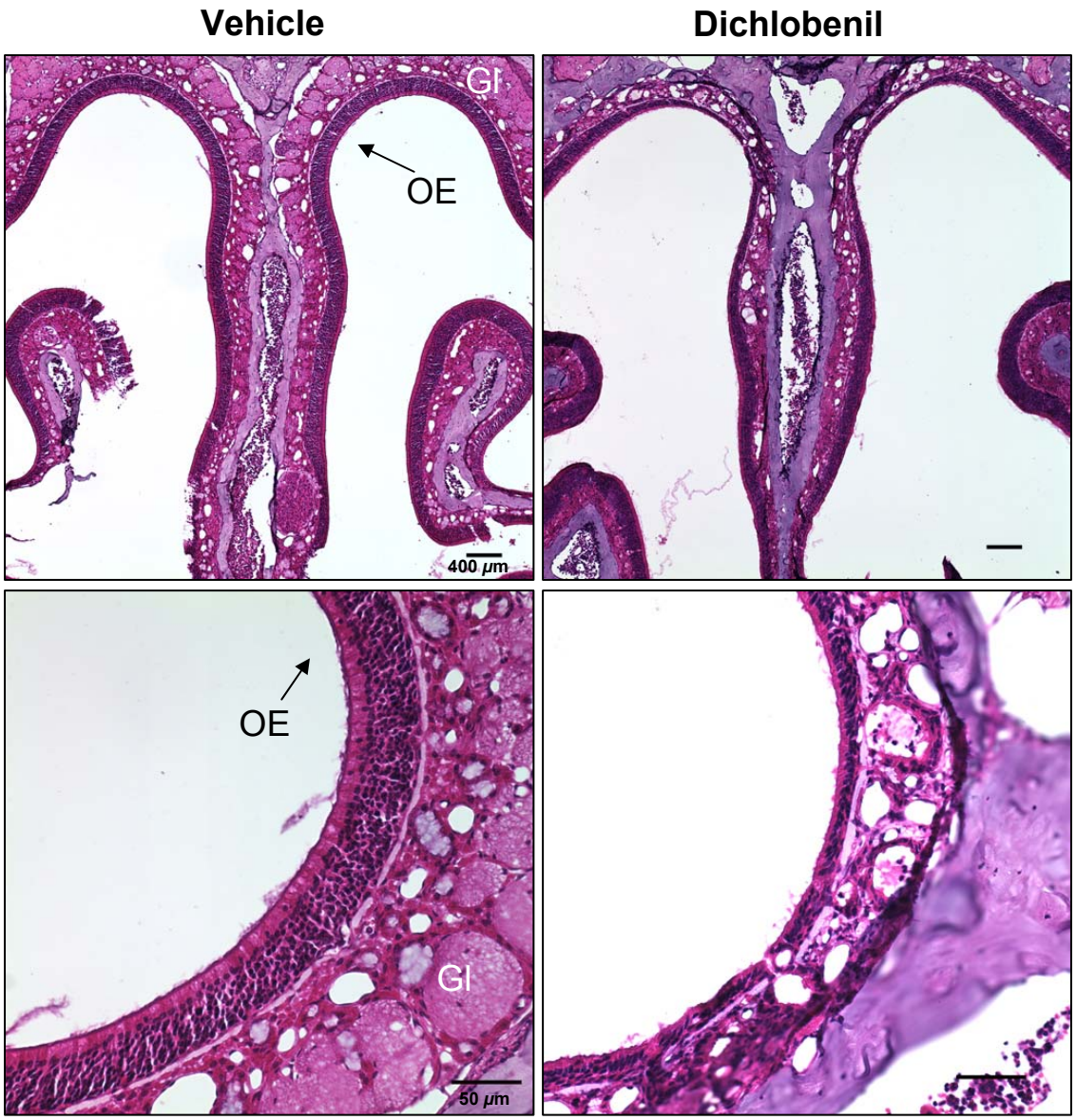


Supplementary Figure 5. Increased OB mass is not due to local OB neurogenesis.
A single injection of BrdU (200 mg/kg) was administered 2 hours before tissue harvest. Representative sections of GCL of OB were stained with BrdU and showed no difference in labeling between control and mutant. GCL, granule cell layer; OB, olfactory bulb; BrdU, 5-Bromo-2'-Deoxyuridine; DAPI is used as counterstain to visualize nuclei.

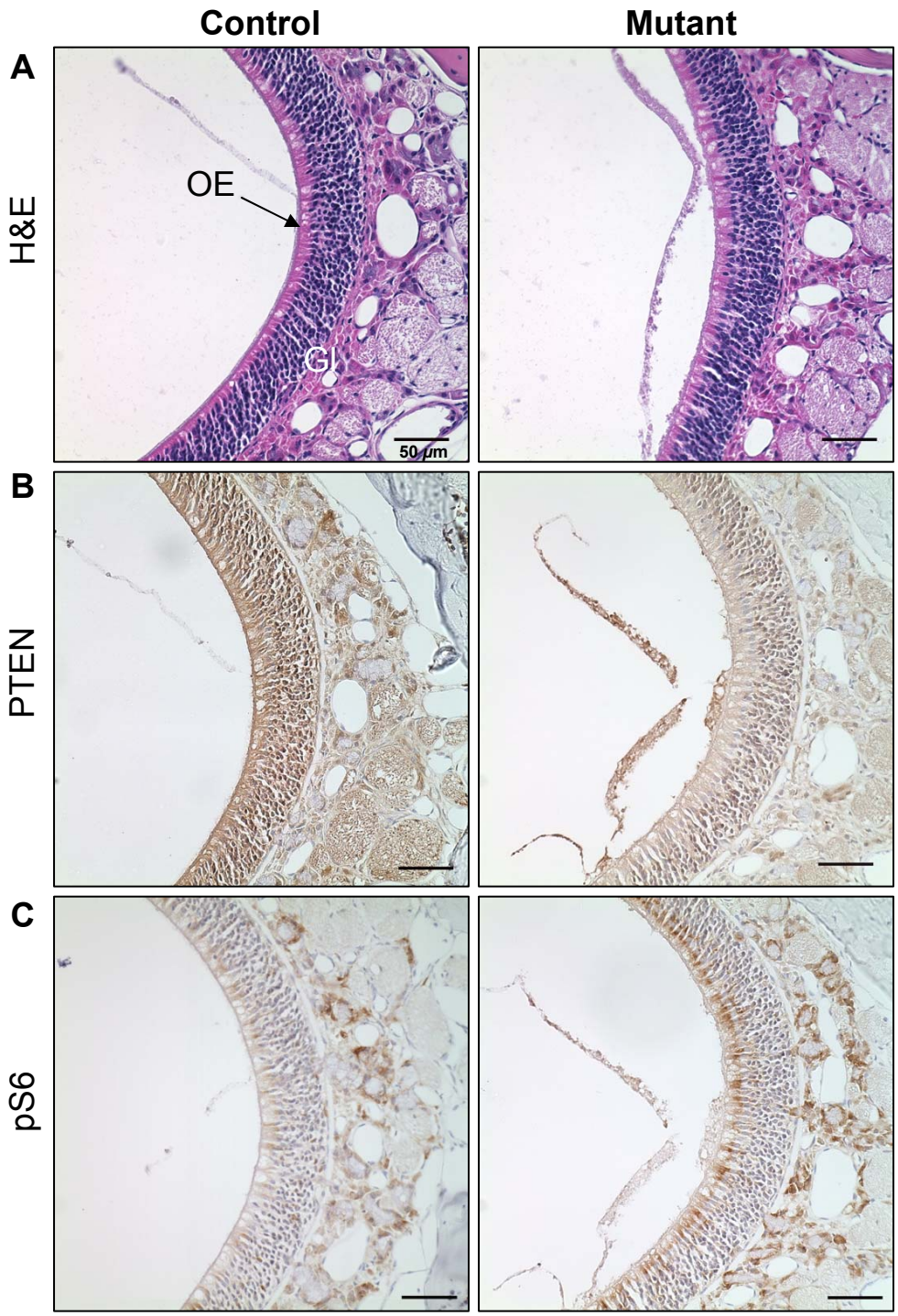


Supplementary Figure 6. *Pten*$^{loxp/loxp}$;*mGFAP-Cre*$^{+}$ mice exhibit enhanced habituation to novel odorants.

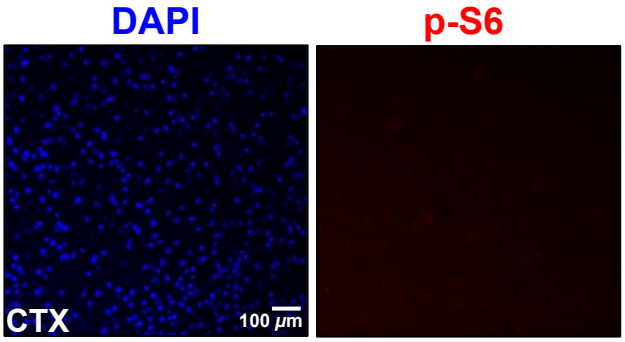
The duration of time spent for each sniff during each trial of the odorant habituation assay is measured. For each odorant, the mutant mice spend less time sniffing the cotton swab in the second and third trials than controls signifying they have a normal to enhanced habituation response to novel odorants.



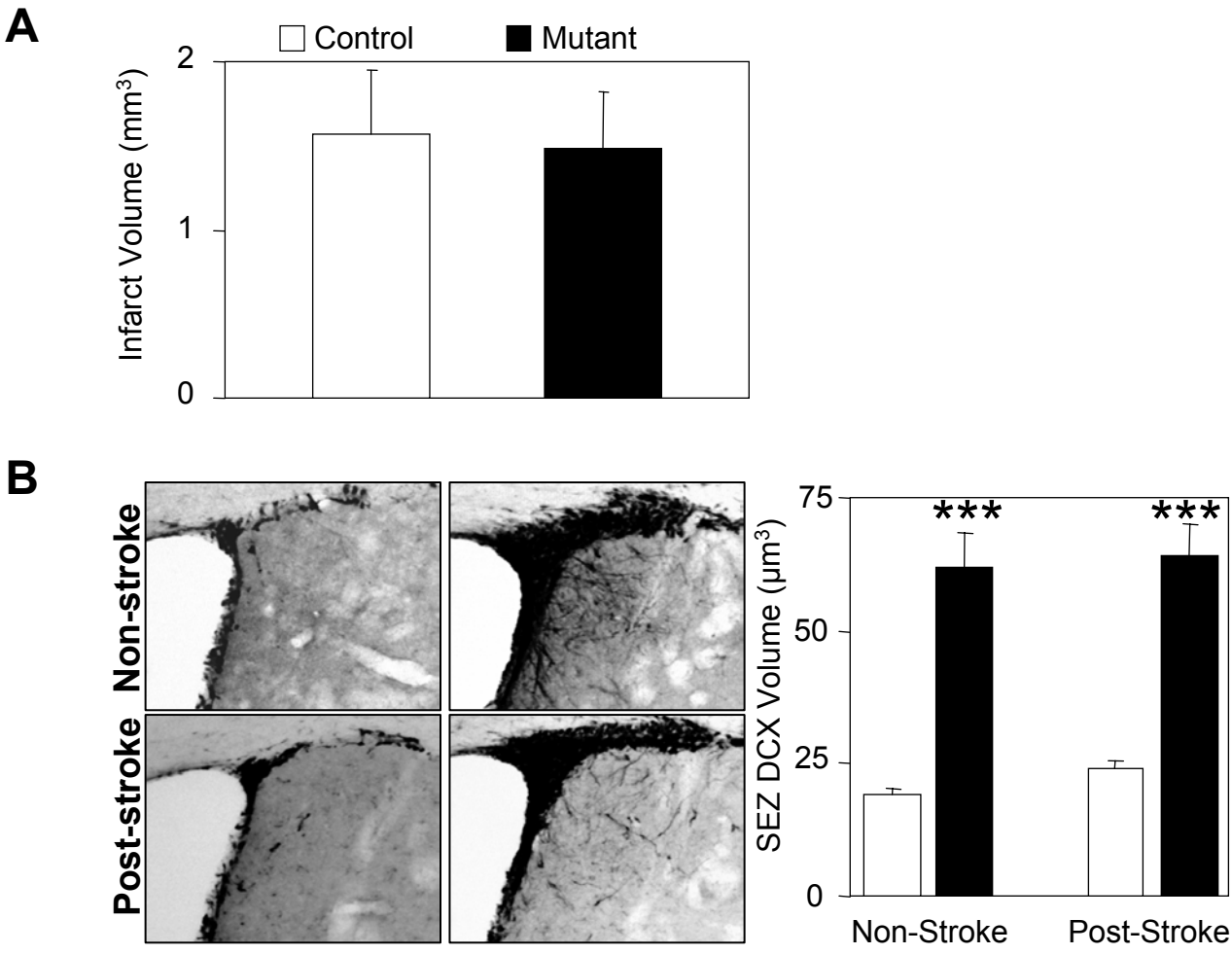
Supplementary Figure 7. Chemical ablation of main olfactory epithelium.
H&E immunostaining on representative sections of the main olfactory epithelium reveal the neuronal layer is highly disrupted in control (wild-type) animals treated with dichlobenil (7 d) when compared to vehicle (DMSO). OE, olfactory epithelium; Gl, glomerular layer.



Supplementary Figure 8. Regeneration of olfactory epithelium neuronal layer post chemical ablation.
At 4 weeks post dichlobenil treatment, H&E immunostaining on representative sections of the main olfactory epithelium show regeneration of the MOE neuronal layer in control (wild-type) and mutant mice . There is no difference in PTEN (B) and p-S6 (C) expression in the sensory epithelium. OE, olfactory epithelium; Gl, glomerular layer.



Supplementary Figure 9. *Pten* null neurons could not be detected in non-stroke mutant cortex.
Representative images of mutant brain shows lack of P-S6 expression in non-stroke mutant cortex. DAPI is used as counterstain to visualize nuclei. CTX, cortex.



Supplementary Figure 10. No difference in infarct or post-stroke SEZ volume after conditional deletion of *Pten.*

(A) Quantification of infarct volume 7 d after stroke. (B) DCX+ cells in control and mutant animals in non-stroke (top) and 7d post stroke (bottom) are shown. Scale bar, 50 µm. The graph on right shows quantification of SEZ DCX volume before and after stroke. Error bars indicate SDs. SEZ, subependymal zone; DCX, doublecortin.