SUPPLEMENTAL FIGURES

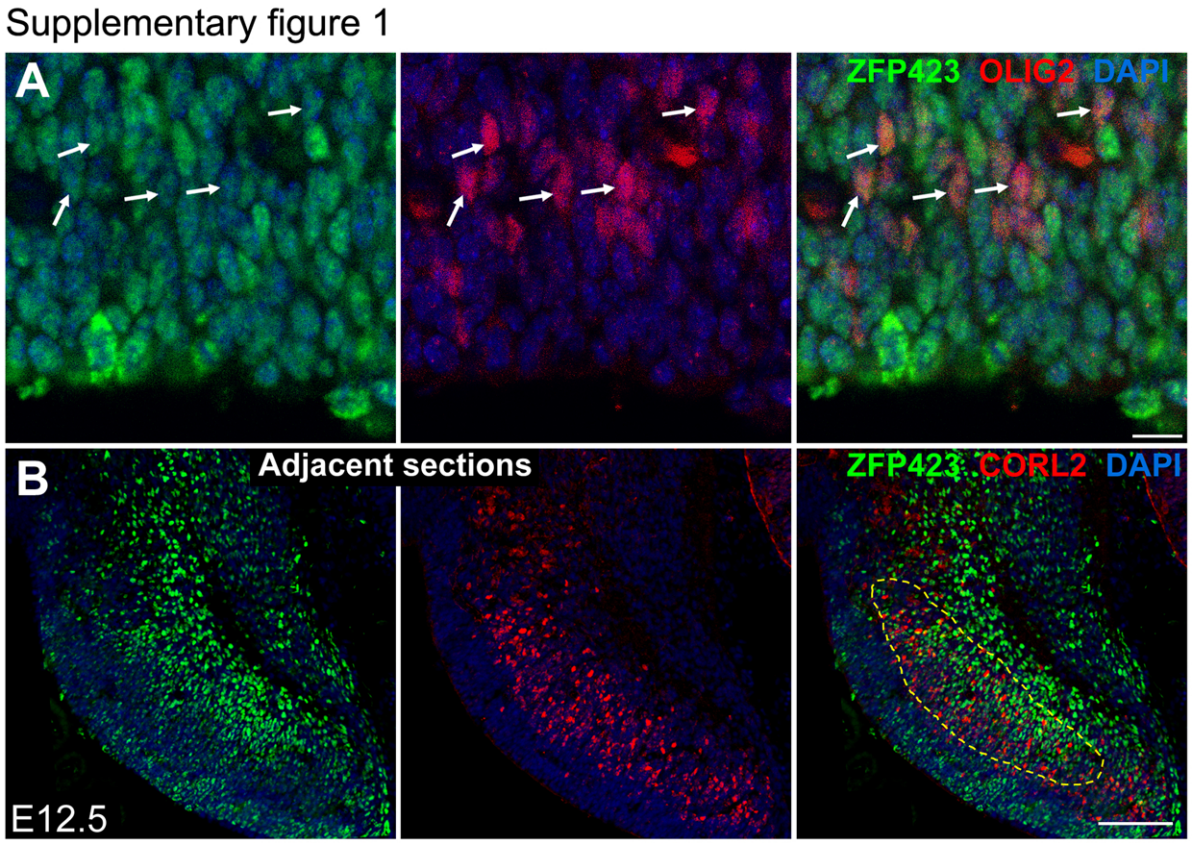

Fig. S1. ZFP423 expression overlaps partially with both OLIG2 and CORL2. Immunofluorescence staining of cerebellar sagittal sections at E12.5. ZFP423 is expressed in some OLIG2+ cells (**A**, arrows) and overlaps partially with CORL2+ domain (**B**). Size bars: **A**, 20µm; **B**, 100µm.

Supplementary figure 2

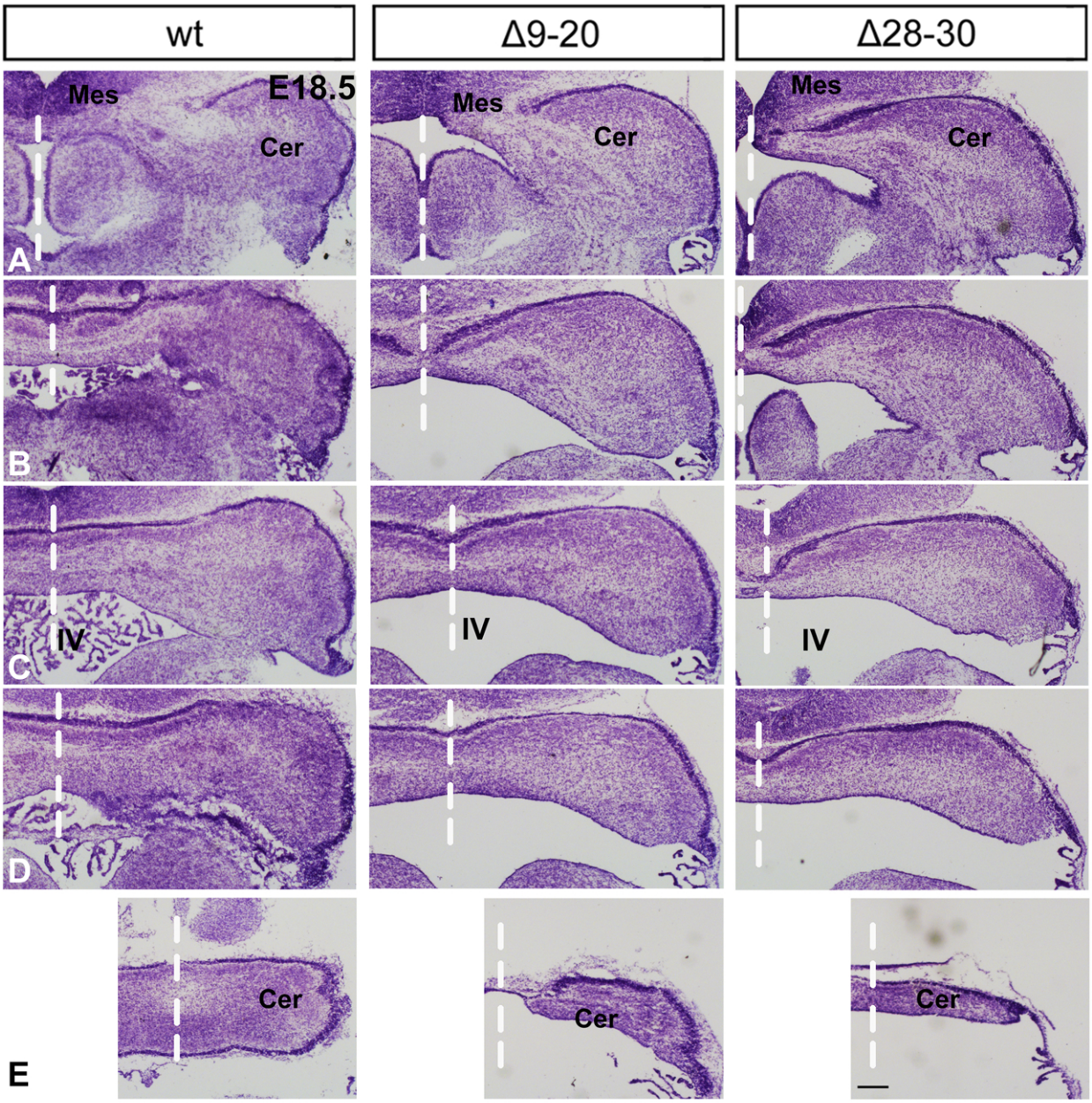

Fig. S2. Profound malformation in E18.5 mutant cerebella. Nissl staining of E18.5 embryo frontal sections showing a reconstructions of the main morphological differences between wt and mutants from rostral (**A**) to caudal (**E**). A severe cerebellar hypoplasia, with a markedly reduced vermis, is visible in both mutations. The Δ28-30 mutant features a more pronounced vermis deletion compare to the Δ9-20 (**C-D)**. Mes: mesencephalon; Cer: cerebellum; IV: fourth ventricle. Vertical dashed line represents the midline. Size Bar: 50µm.

Supplementary figure 3

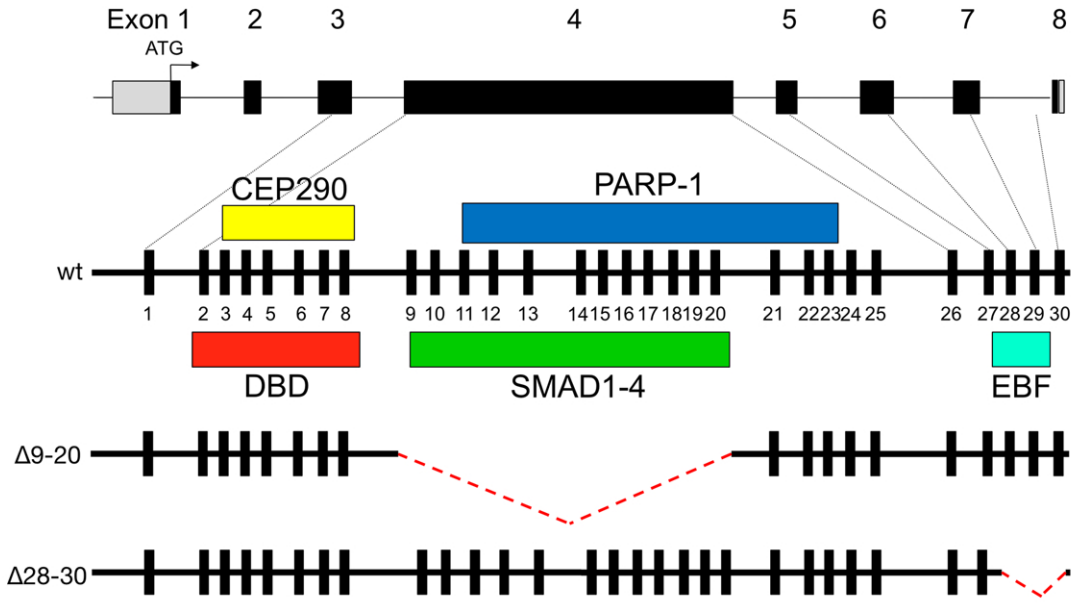

Fig. S3. ZFP423 is a nuclear scaffold establishing domain-specific interactions with multiple regulatory factors. ZFP423 / ZNF423 has been characterized as a nuclear scaffold protein mediating multiple protein-protein interactions. Briefly: CEP290 is a centrosomal protein implicated in centrosome and cilium development; PARP1 is a chromatin-modifying enzyme that triggers ADP-ribosylation of other nuclear proteins and has been implicated in DNA damage repair; SMAD proteins are nuclear transducers of BMP signaling; EBFs are transcription factors implicated in neuronal differentiation, migration and survival. See text for references.

Supplementary figure 4

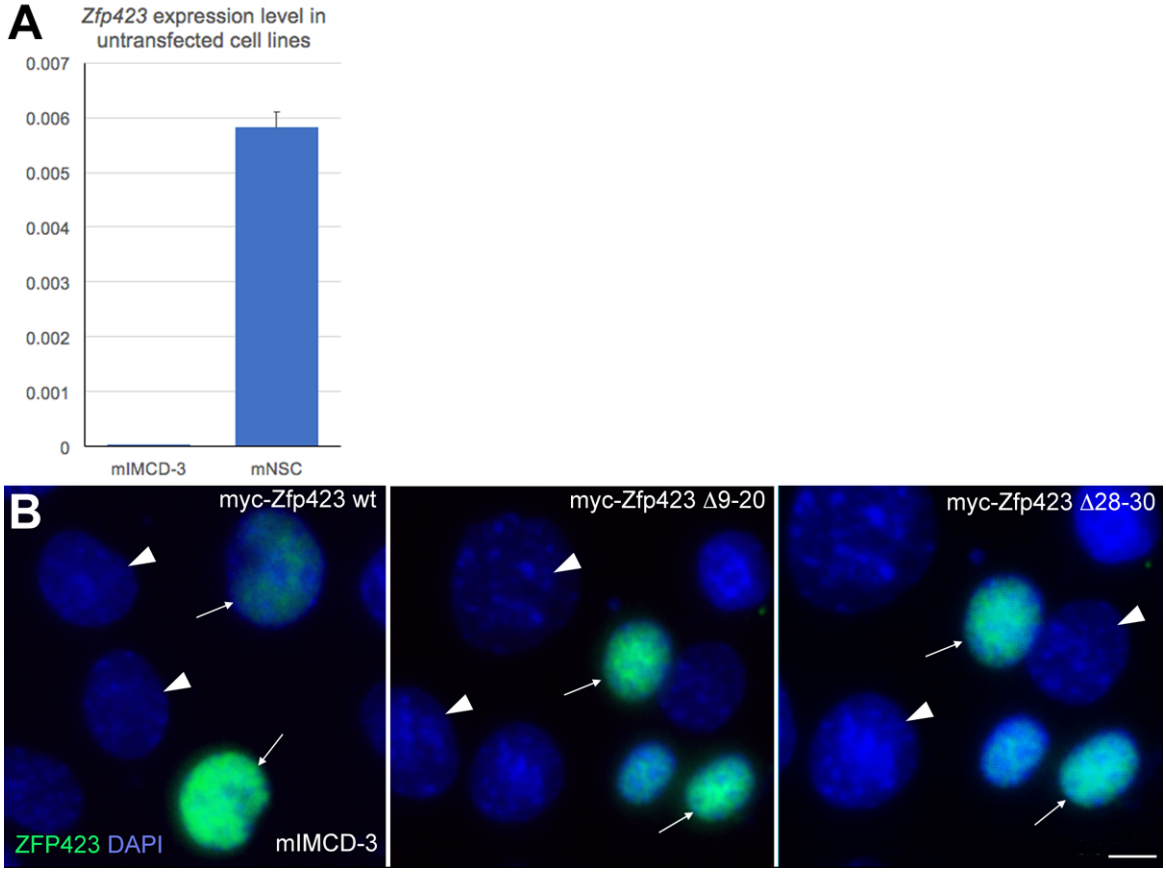

Fig. S4. Specific immunolabeling of ZFP423 by the sc-48785 antibody cells. A, RTqPCR indicates that *Zfp423* mRNA is undetectable in the IMCD-3 cell line. As a positive control, we used mouse cerebellar neural stem cells (NSCs) that strongly express *Zfp423*. **B,** IMCD-3 cell line transfected with tagged wt *Zfp423* and/or each of the mutant tagged constructs. Immunofluorescence for ZFP423 reveals that the Ab specifically recognizes transfected cells (arrows), while no signal is detectable in untrasfected cells (arrowheads). Size bar: 25µm.

Supplementary figure 5

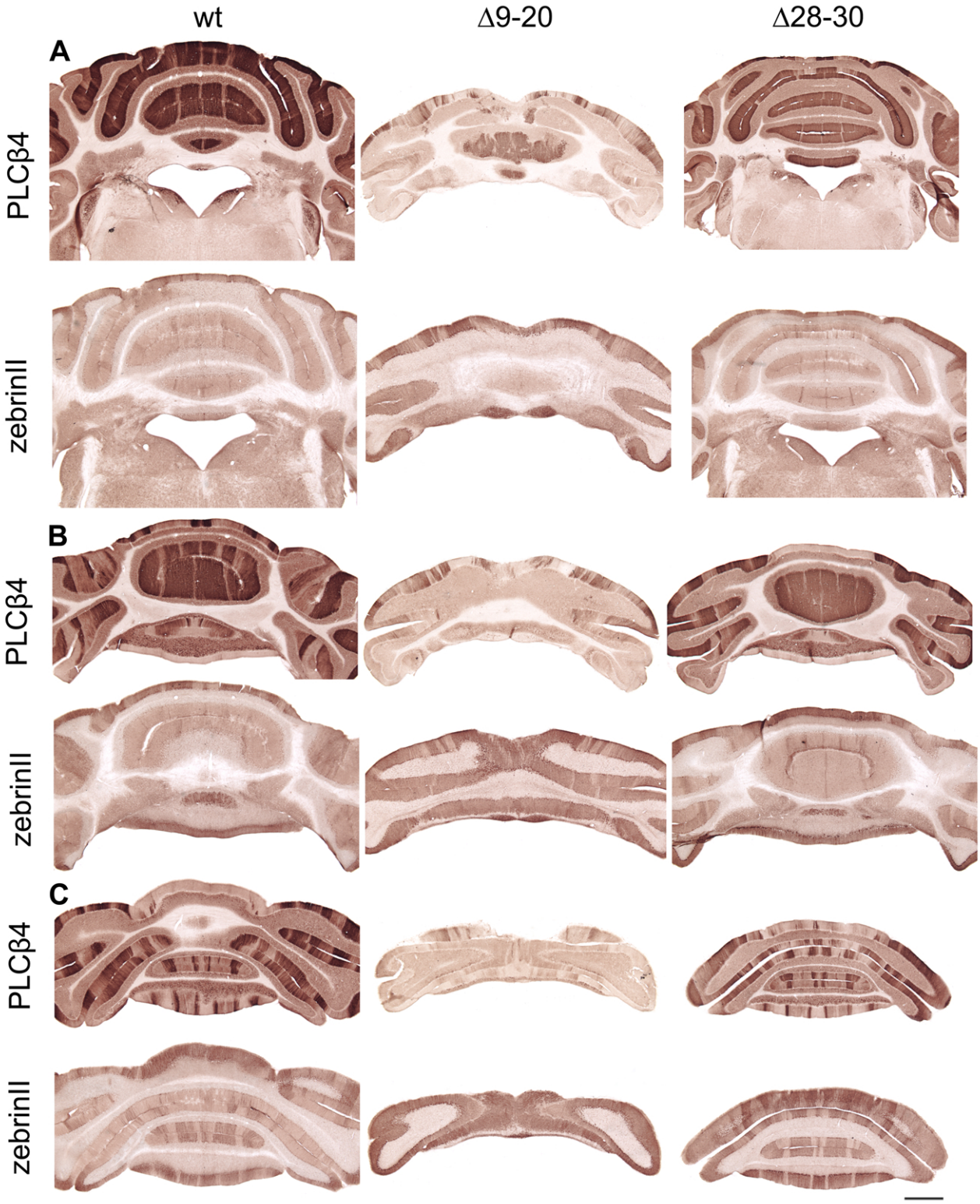

Fig. S5. ZebrinII-negative PCs are selectively lost in the Δ9-20 mutant. Zebrin II and PLCβ4 immunostaining of several P23 frontal cerebellar sections from rostral (**A**) to caudal (**C**). The results confirm a selective depletion of late-born PCs (mostly PLCβ4+) in Δ9-20 mutants, Throughout the cerebellum. Conversely, the Δ28-30 mutant cerebellum contains a balanced representation of early- (zebrin II+) and late-born (PLCβ4+) PCs and shows a dramatic decrease in size in the posterior area. Size bar: 1mm.

Supplementary figure 6

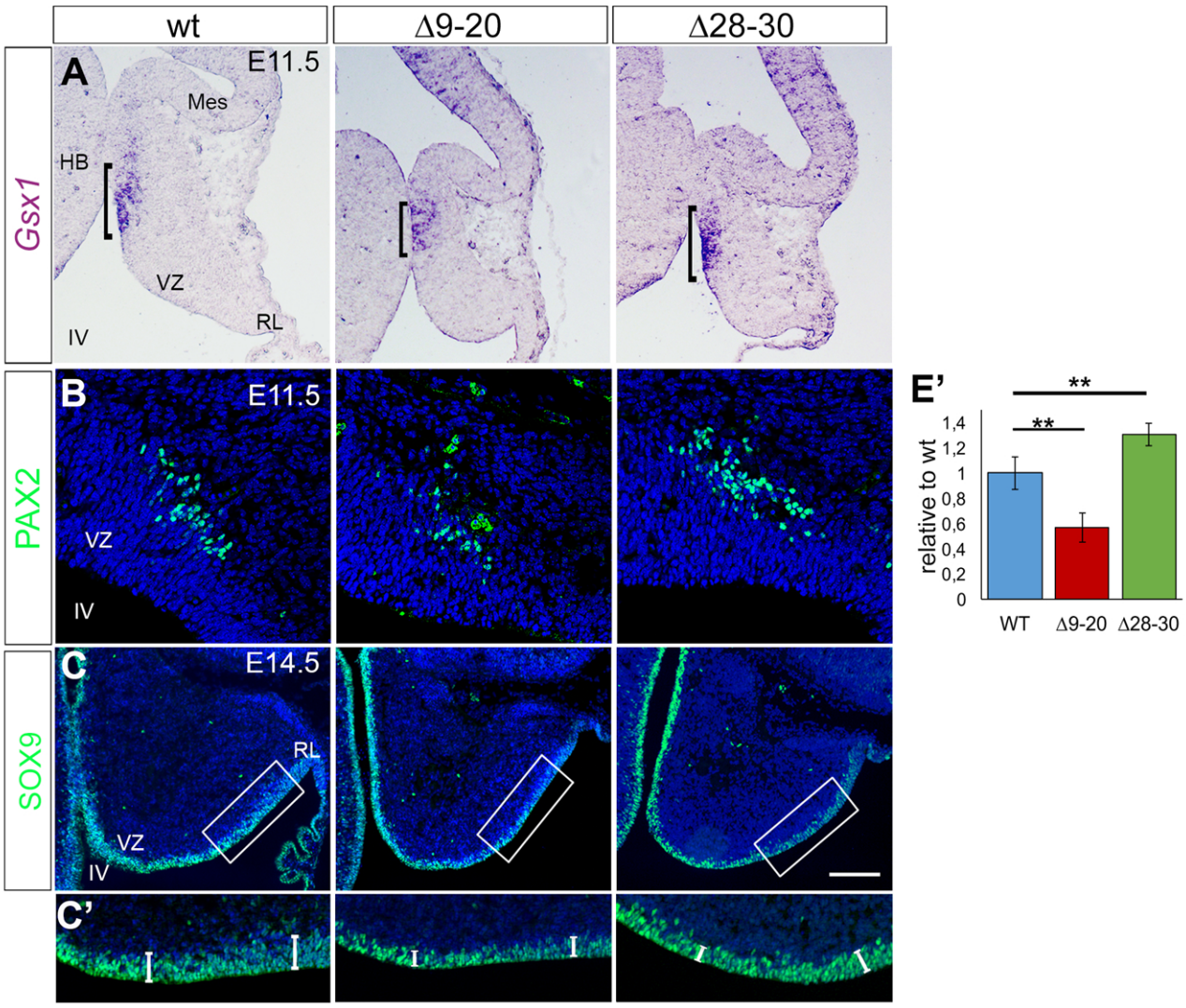

Fig. S6. Both GABA interneuron- and astrocyte progenitors are depleted in the Δ9-20 mutant. *In situ* hybridization (**A**) and immunofluorescence staining (**B**, **C**) of cerebellar sagittal sections at E11.5 (**A, B**) and E14.5 (**C**) (rostral to the left). **A**: the domain positive for *Gsx1* in the Δ9-20 primordium is reduced compared to the wt. **B:** PAX2-positive immunostaining of cerebellar sagittal sections at E11.5. The graph on the right shows that the number of PAX2+ cells decreases dramatically in the Δ9-20 mutant compared to the wt and increases in the Δ28-30 mutant (N=3/genotype; $^{**}p<0.001$, Fisher's exact test). **C:** SOX9-positive immunostaining of cerebellar sagittal sections at E14.5. **C'**: Magnification of the VZ (inset in **C**), showing an evident decrease in the number of SOX9+ cells in the Δ9-20 and Δ28-30 mutants, compared to the wt. The height of the white bars shows the different thickness of the SOX9+ domain, indicating a dramatic loss of SOX9 cells, particularly in the Δ9-20. Size bars: **A**: 150µm; **B**: 40µm; **C**: 200µm.

Supplementary figure 7

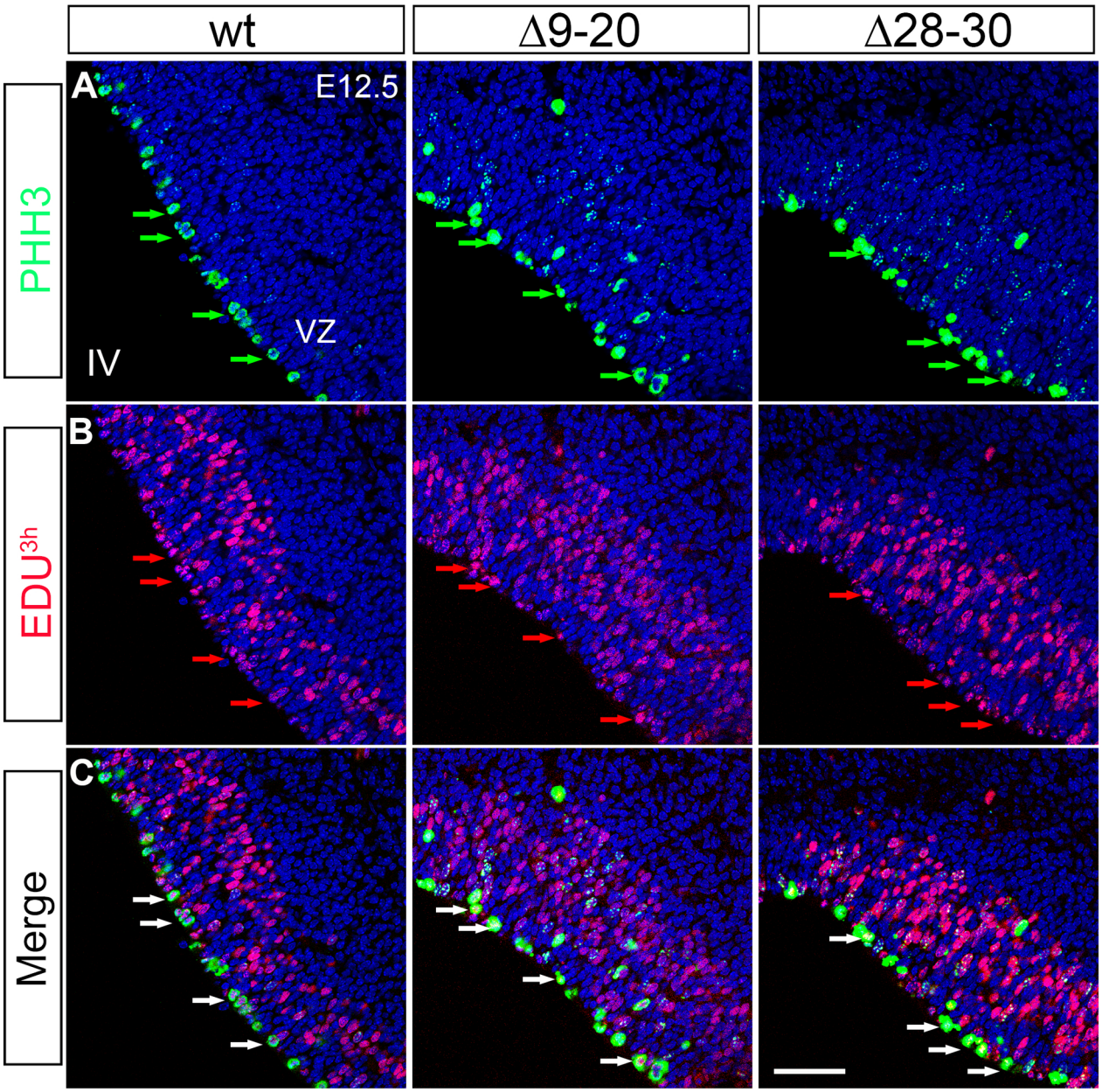

Fig. S7. In *Zfp423* mutants, fewer progenitors transit from S- to M-phase in 3 hours. A-C: Sagittal sections of the cerebellar primordium at E12.5 immunostained for PHH3 and EdU, single 3h pulse (rostral to the left). **A**: Full PHH3-positive cells are M-phase progenitors (green arrows). **B**: cells labeled by a single EdU 3h pulse (red) span the thickness of the VZ, including M-phase progenitors (red arrows). **C**: overlay of the 2 markers indicates that all M phase progenitors are also positive for EdU (white arrows) in the wt cerebellum and in both mutants. See text for discussion. Size bar: **A-C**: 40µm.