

Fig. S1. Characterization of SOX1-positive cells in the SVZ. *Sox1*-GFP mice were sacrificed at 4 months of age and brains were harvested and sectioned into 50 μm slices for antibody staining and imaging by confocal microscopy. (A) GFP (green), Sox1 (red) and DNA (ToPro3, blue) staining of the SVZ. (B) GFP (green), Sox1 (red) and DNA (ToPro3, blue) staining of a representative co-stained cell along the lateral wall of the lateral ventricle. (C) GFP (green), PSA-NCAM (red) and DNA (ToPro3, blue) staining of cells along the lateral wall of the lateral ventricle. LV indicates the lateral ventricle space. Scale bars: 10 μm.

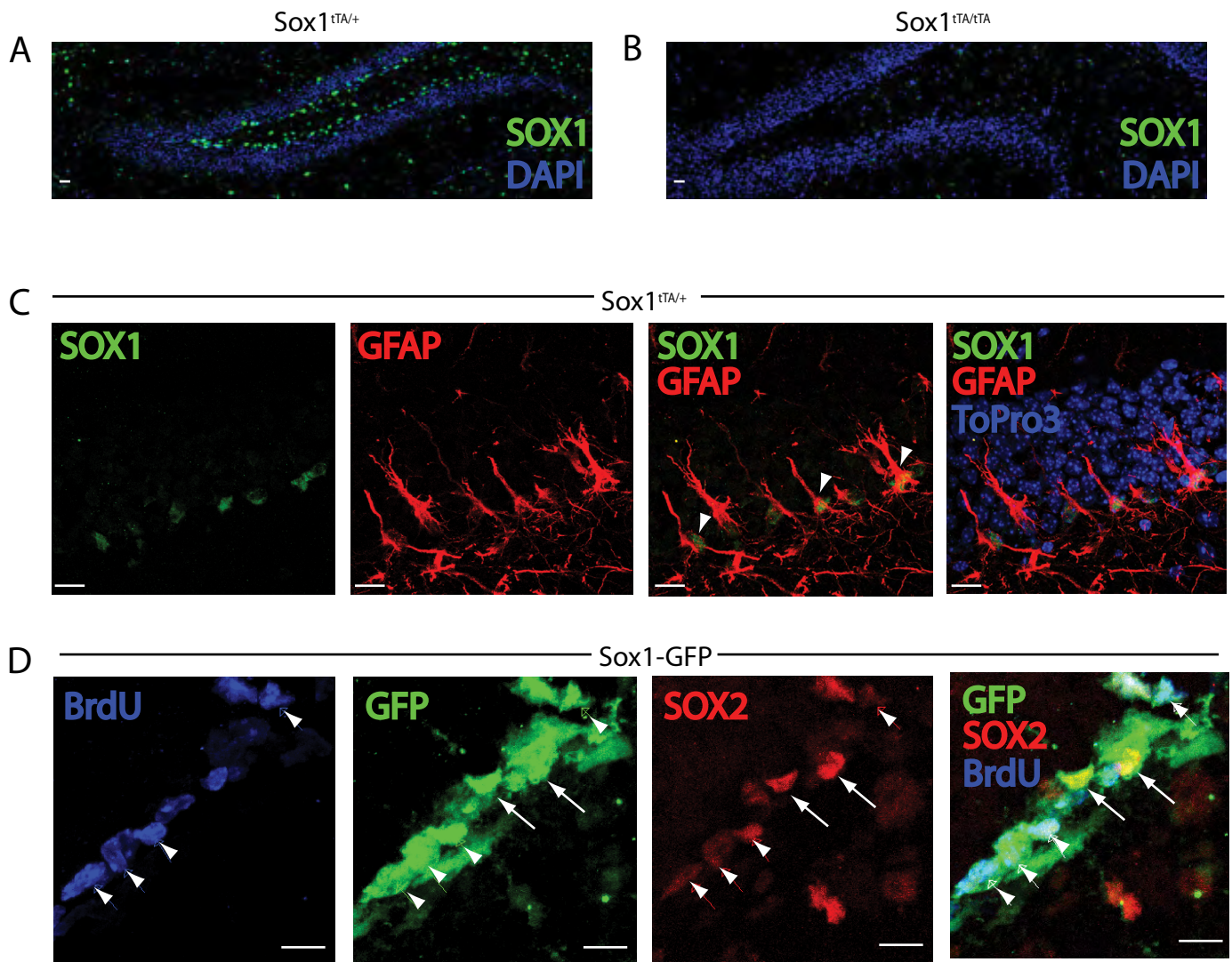


Fig. S2. Characterization of SOX1-positive stem/progenitor cells. (A,B) 12 μm sections of the dentate gyrus from 4-month-old Sox1 heterozygous (A) or null (B) mice stained with Sox1 (green) and DAPI (blue). (C) Sox1 (green), GFAP (red) and DNA (ToPro3, blue) staining of a 50 μm section of the dentate gyrus from a 3.5-month-old *Sox1-tTA* mouse. Arrowheads mark cells where Sox1 and GFAP colocalize. (D) BrdU (blue), GFP (green) and Sox2 (red) staining of a 50 μm section of the dentate gyrus from a 3.5-month-old *Sox1-GFP* mouse given BrdU in the drinking water for 1 week. Arrowheads mark cells positive for all three antibodies. Arrows mark cells positive for GFP and Sox2. Scale bars: 10 μm .

Sox1-tTA; LC-1; R26eYFP
keep on dox control

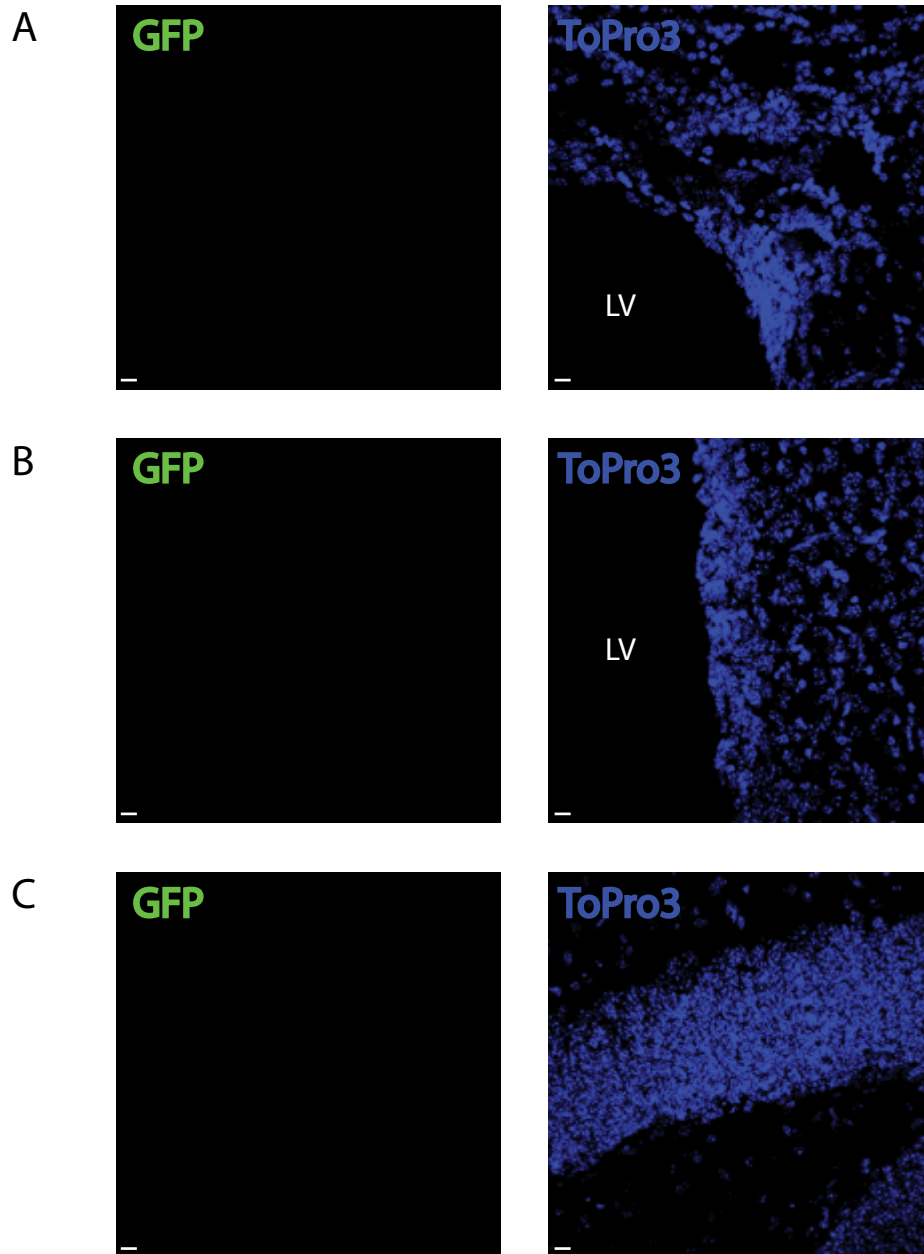


Fig. S3. Validation of doxycycline control within the lineage tracing system. GFP (green) and DNA (ToPro3, blue) staining of a 50 μm section of the dorsal corner of the lateral ventricle (A), lateral wall of the lateral ventricle (B) and dentate gyrus (C) from a 3.5-month-old *Sox1-tTA*; LC-1; R26eYFP control mouse kept on doxycycline (system silenced) during the 8-week lineage tracing of experimental mice. Scale bars: 10 μm .

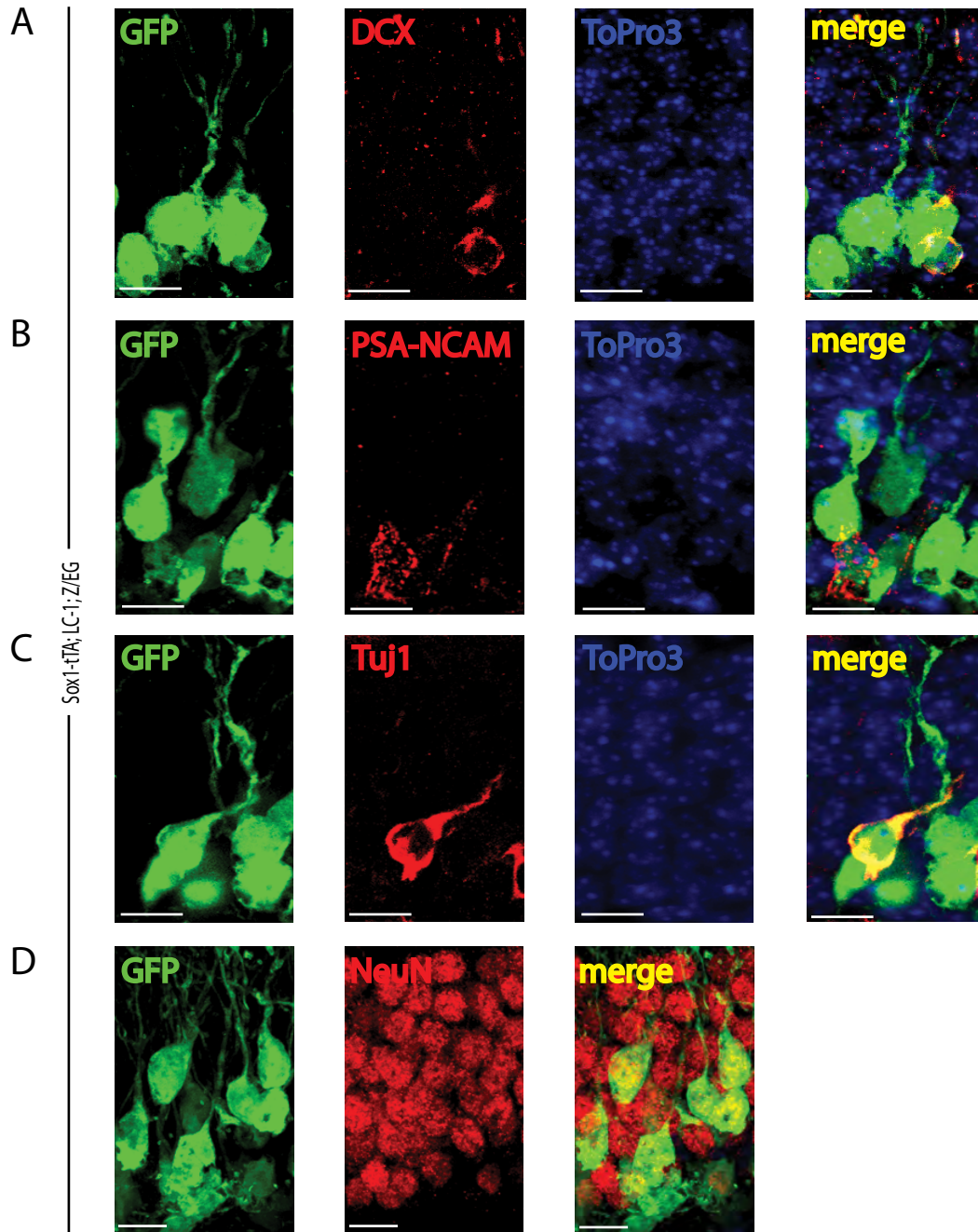


Fig. S4. Single channel images for colocalization of lineage traced cells in the dentate gyrus of *Sox1-tTA; LC-1; Z/EG* mice. GFP (green), DCX (red) and DNA (Topro3, blue) staining (A); GFP (green), PSA-NCAM (red) and DNA (Topro3, blue) staining (B); GFP (green), Tuj1 (red) and DNA (Topro3, blue) staining (C); and GFP (green) and NeuN (red) staining (D) of a 50 μ m section of the dentate gyrus from a 3.5-month-old *Sox1-tTA; LC-1; Z/EG* mouse. Scale bars: 10 μ m.

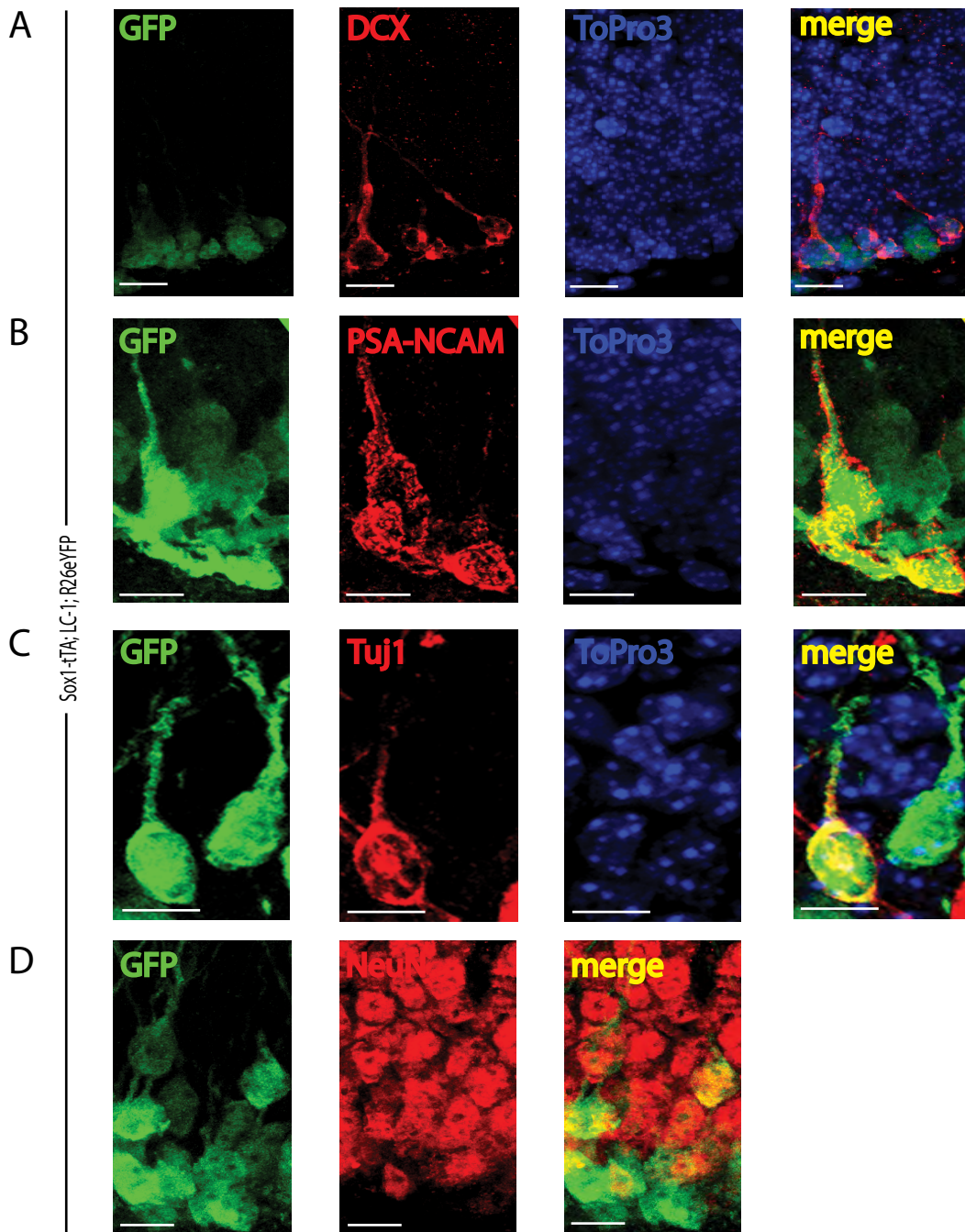


Fig. S5. Single channel images for colocalization of lineage traced cells in the dentate gyrus of *Sox1-tTA; LC-1; R26eYFP* mice. GFP (green), DCX (red) and DNA (Topro3, blue) staining (**A**); GFP (green), PSA-NCAM (red) and DNA (Topro3, blue) staining (**B**); GFP (green), Tuj1 (red) and DNA (Topro3, blue) staining (**C**); and GFP (green) and NeuN (red) staining (**D**) of a 50 μm section of the dentate gyrus from a 3.5-month-old *Sox1-tTA; LC-1; R26eYFP* mouse. Scale bars: 10 μm .

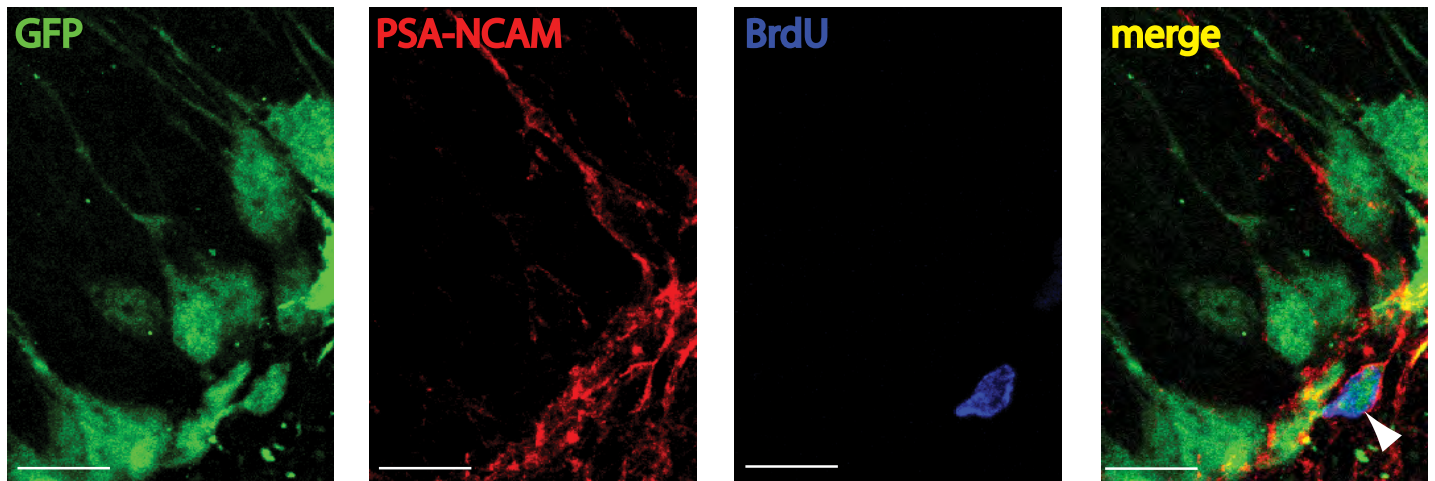


Fig. S6. Proliferation of lineage traced neuroblasts. GFP (green), PSA-NCAM (red) and BrdU (blue) staining of a 50 μm section of the dentate gyrus from a 3.5-month-old *Sox1-tTA*; LC-1; R26eYFP mouse. Arrowhead marks a cell positive for all three antibodies. Scale bars: 10 μm .

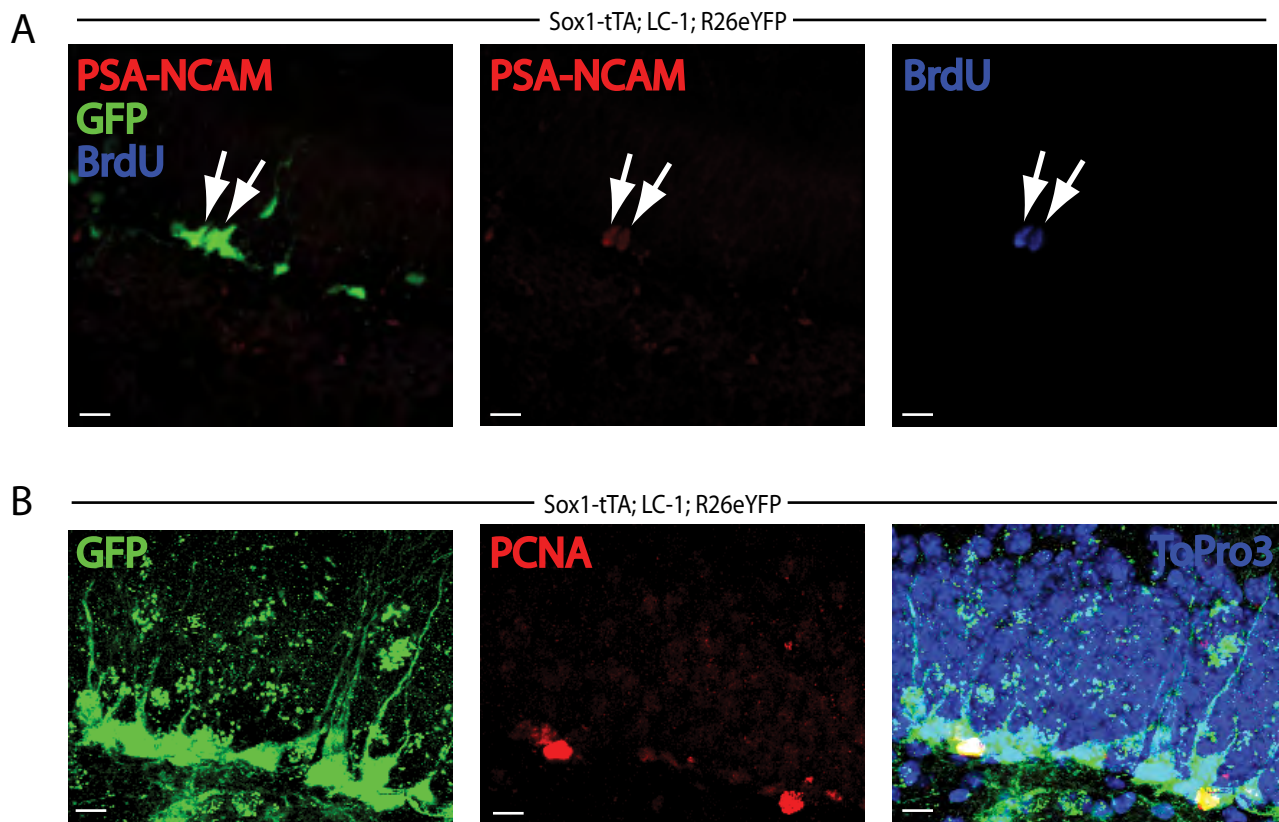


Fig. S7. Proliferation of lineage traced neuroblasts following inactivation of the tTA system. (A) GFP (green), PSA-NCAM (red) and BrdU (blue) staining of a 50 μm section of the dentate gyrus from a 26-week-old *Sox1-tTA*; LC-1; R26eYFP mouse kept off dox for 8 weeks then put back on dox for 12 weeks. Arrows mark cells positive for all three antibodies. (B) GFP (green), PCNA (red) and DNA (ToPro3, blue) staining of a 50 μm section of the dentate gyrus from a 26-week-old *Sox1-tTA*; LC-1; R26eYFP mouse kept off doxycycline for 8 weeks then put back on doxycycline for 12 weeks. Note that grainy GFP staining above the SGZ is background. Scale bars: 10 μm .

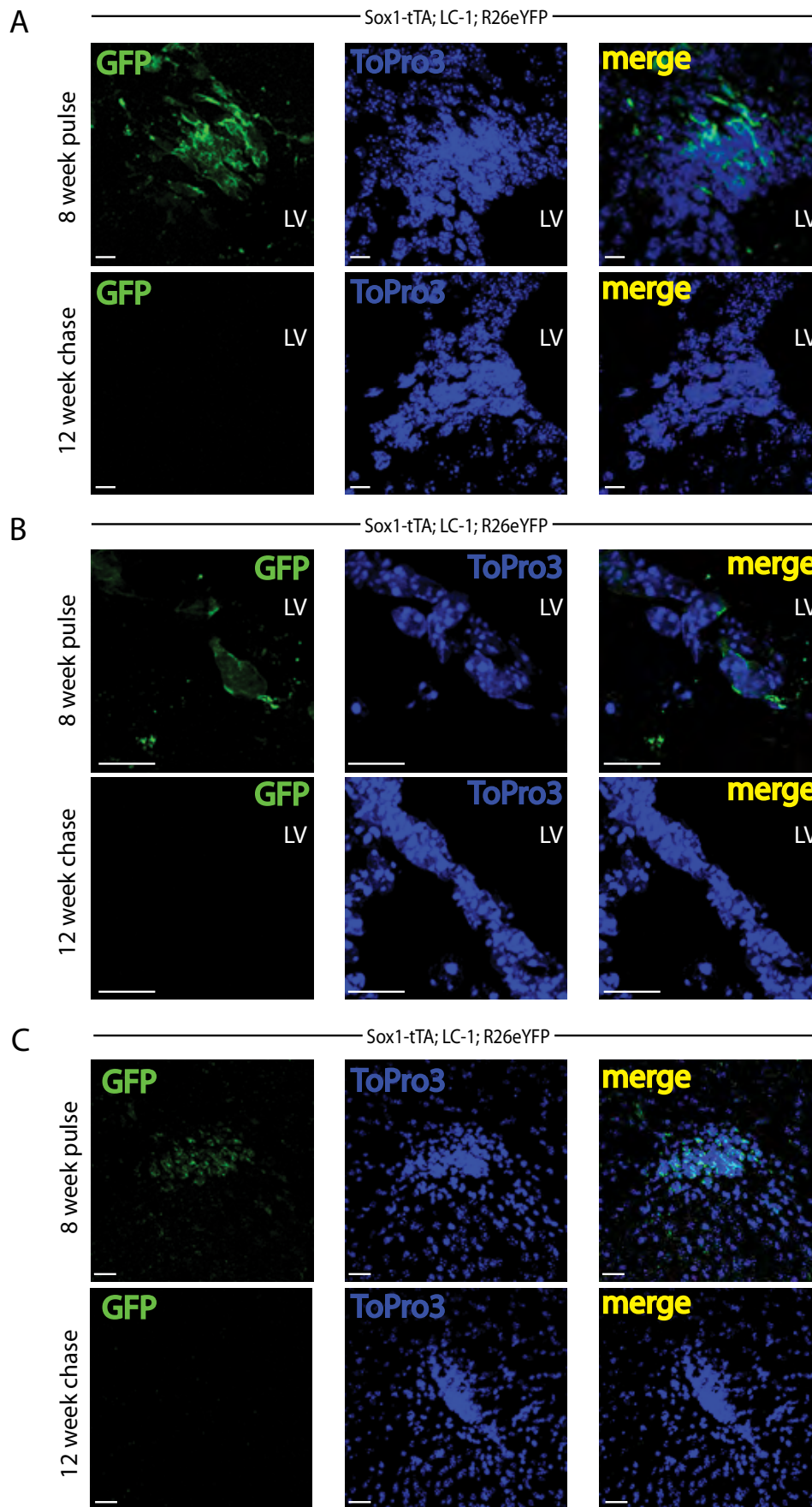


Fig. S8. Pulse/chase lineage tracing in the SVZ. GFP (green) and DNA (ToPro3, blue) staining of a 50 μ m section of the dorsal corner of the lateral wall (A), lateral wall of the lateral ventricle (B) or rostral migratory stream (C) from *Sox1-tTA; LC-1; R26eYFP* mice kept off doxycycline (pulse) for 8 weeks or put back on doxycycline (chase) for 12 weeks. LV indicates the lateral ventricle. Scale bars: 10 μ m.