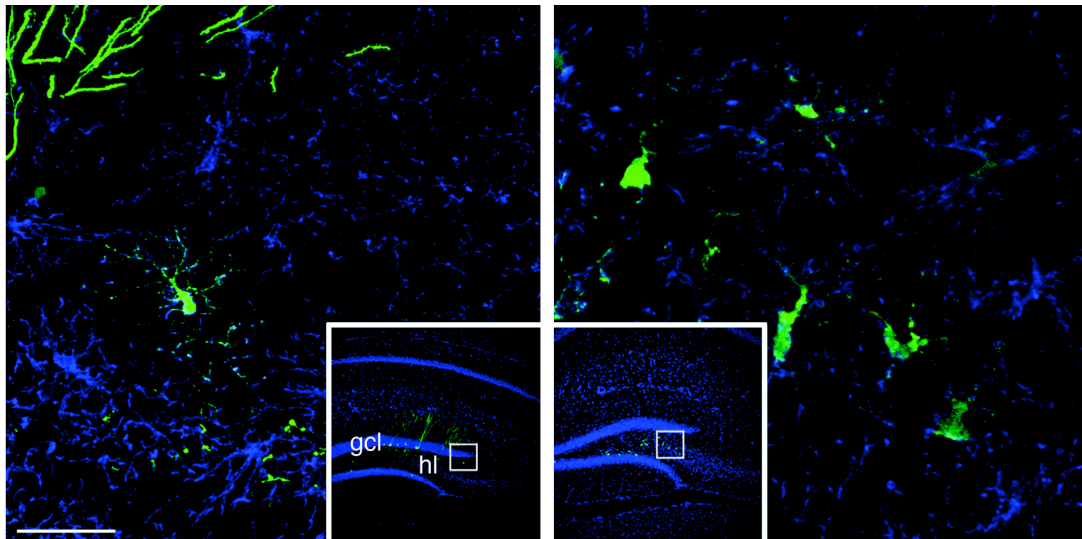


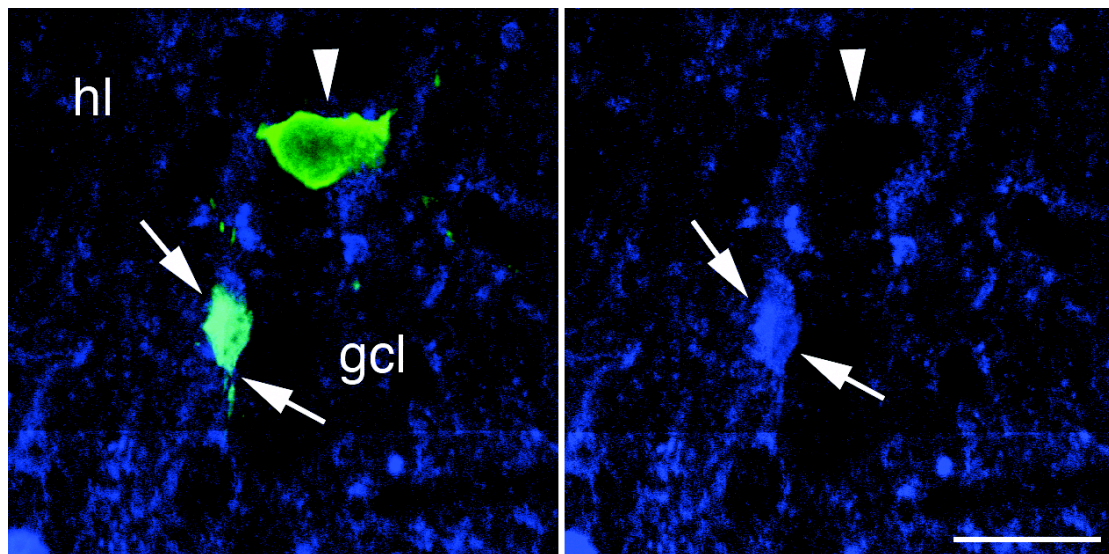
“Directed Differentiation of Hippocampal Stem/Progenitor Cells in the Adult Brain”

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Fred H. Gage

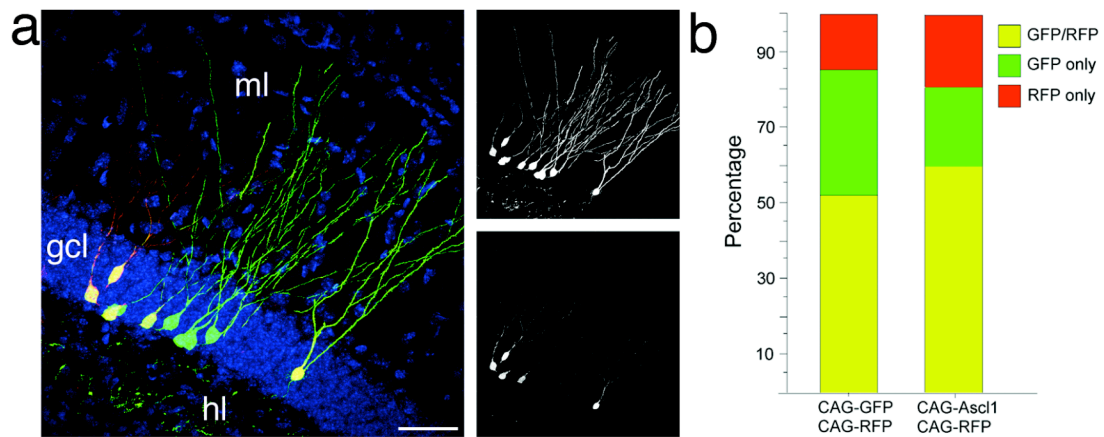
**SUPPLEMENTARY FIGURES**



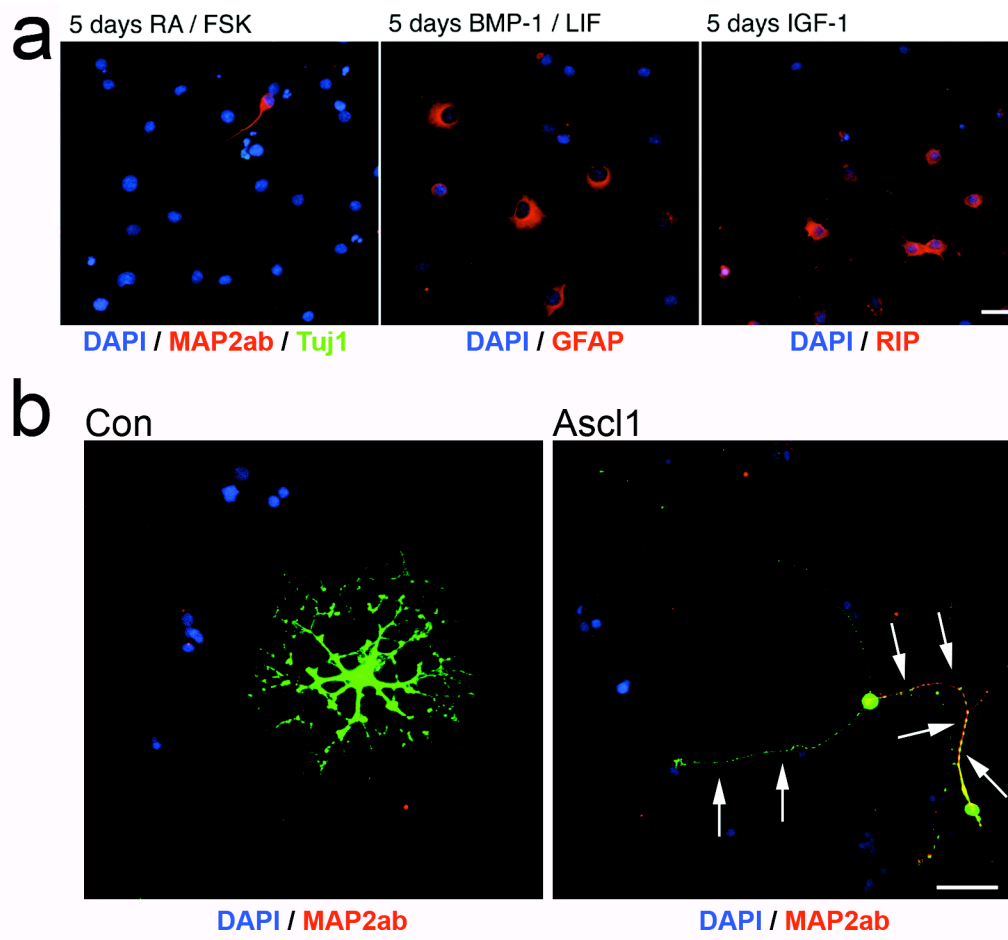
**Supplementary Figure 1.** *Ascl1* overexpression results in fate change of AHP-generated cells. Four weeks after injection of control virus CAG-GFP (green, left panel), only very few cells, most of which are localized in the hilus, co-label with the oligodendrocytic marker NG2 (blue). In contrast, newborn cells transduced with CAG-*Ascl1* (green, right panel) show a distinct morphology and often co-express NG2 (blue in right panel). Insets show the localization of the high-power images within the dentate gyrus (DAPI in blue). ml, molecular layer; hl, hilus; gcl, granule cell layer. Scale bar (for large panels): 50  $\mu$ m.



**Supplementary Figure 2.** A fraction of *Ascl1*-induced cells express the oligodendrocytic marker CNPase. Four weeks after injection of *Ascl1*-expressing retrovirus, a subset of *Ascl1*-overexpressing cells (GFP, green) express the oligodendrocytic marker CNPase (blue). Arrows point toward a CNPase-GFP co-labeled cell; arrowheads indicate a GFP-positive cell that is negative for CNPase. hl, hilus; gcl, granule cell layer. Scale bar: 20  $\mu\text{m}$ .



**Supplementary Figure 3.** Control virus and *Ascl1*-expressing retrovirus target the same progenitor. **(a)** Co-injection of control CAG-RFP and CAG-GFP retrovirus shows the partial co-transduction of dividing AHPs at the time of injection (compare to Fig. 3 for CAG-RFP and CAG-*Ascl1* virus co-injections). Upper right panel shows the GFP signal; lower right panel shows the RFP signal only. **(b)** Quantification of co-transduced cells reveals a constant ratio of CAG-GFP/CAG-*Ascl1*-only expressing cells (green), CAG-GFP/CAG-*Ascl1* plus CAG-RFP-expressing (yellow), and CAG-RFP-only-expressing (red) cells 4 weeks after virus injection. ml, molecular layer; gcl, granule cell layer; hl, hilus. Scale bar: 50  $\mu$ m.



**Supplementary Figure 4.** In vitro analyses of *Ascl1* function. **(a)** AHPs isolated from the adult dentate gyrus can generate neuronal (MAP2ab, red in left panel), glial (GFAP, red in middle panel), and oligodendrocytic (RIP, red in right panel) cells. **(b)** *Ascl1* expression induces neuronal differentiation (MAP2ab, red, arrows pointing toward MAP2ab-labeled neurites extending from *Ascl1*-expressing cells) of progenitors isolated from the adult SVZ. Note that cells transduced with CAG-GFP control virus do not express neuronal marker MAP2ab. Scale bar in a, b: 20  $\mu$ m.