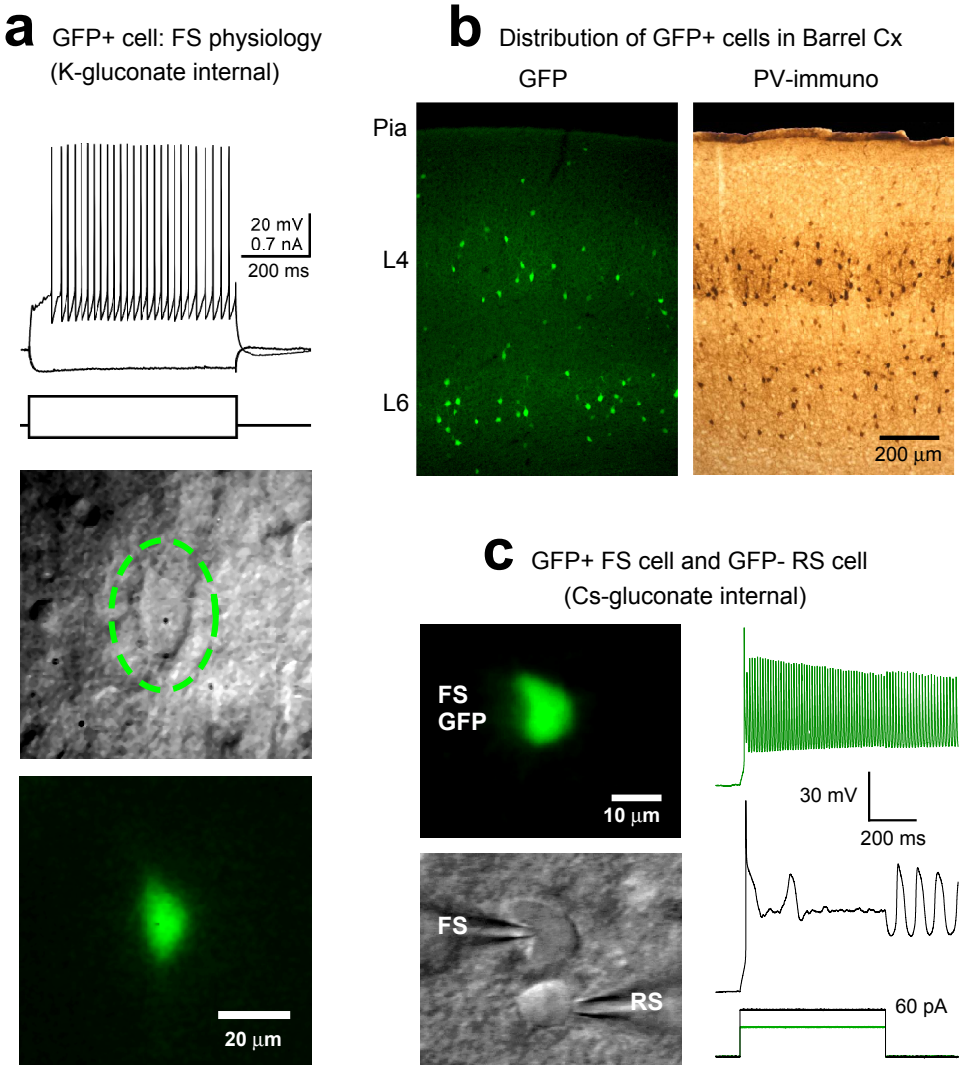

Supplementary Figure 1: GFP expression in FS cells of the G42 mouse line. **(a)** Recording from a GFP positive cell in layer 4 of barrel cortex, from a G42 mouse. The whole-cell pipette contained K-gluconate (see Methods). The intrinsic responses to current injection had typical FS characteristics (top). Middle and bottom panels are IR-DIC and fluorescent images of the cell. Similar results were obtained from 8 GFP positive cells (4 different animals) using K-gluconate based internal recording solution. **(b)** Left panel is a fluorescent image of a thin fixed section (40 μm; 4% paraformaldehyde fixation) showing distribution of GFP in barrel cortex of a G42 mouse (left panel). The highest densities were in layer 6, but some GFP-expressing cells were also in layer 4. Right panel shows an adjacent section from the same brain, stained immunohistochemically for parvalbumin (PV). Note the clearly differentiated barrels in layer 4. By comparing the GFP and PV sections, it appears that the density of GFP expressing cells was about half that of the PV-positive cells. This is consistent with findings of Huang and colleagues, who found that the GFP expressing cells comprise about half of the parvalbumin-positive positive population within neocortex (Chattopadhyaya et al., 2004)[42]. **(c)** Simultaneous recordings from GFP-positive FS cell and GFP-negative RS cell. Even though the recording electrodes contained cesium gluconate, the FS cell continued to fire action potentials at rates approaching 100 Hz (green traces, upper right). In contrast, the RS cell fired a single large sodium spike then remained relatively depolarized during the current pulse (black traces, middle right). Following termination of the current pulses, both cells fired action potentials. In the FS cell, these were relatively narrow and appeared to be sodium spikes, whereas in the RS cell, the action potentials were much wider and took on the shape of calcium spikes. The difference in ability to repolarize and spike repetitively under these conditions may have been due to the greater abundance of cesium-permeable Kv3.1 channels in the FS cells (Rudy & McBain, 2001)[46].