Figure legends

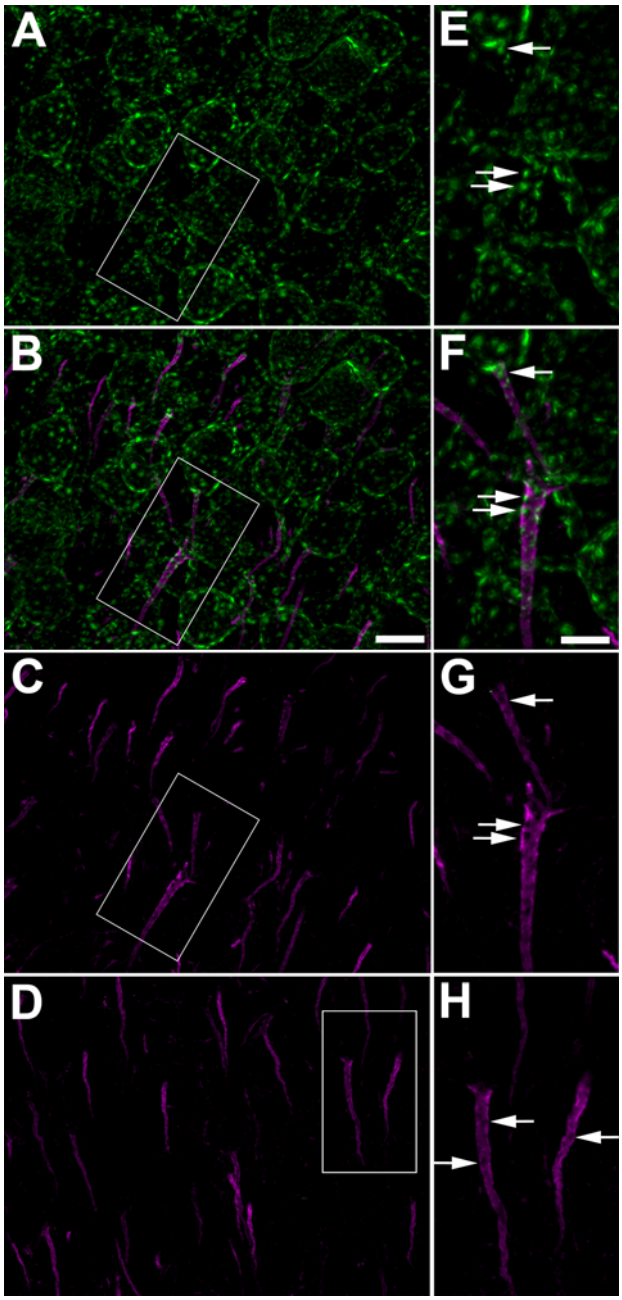

Figure 1. Kv2.1 is localized on the AIS of mouse neocortical neurons. A-D: Mouse brain sections double immunofluorescence labeled for Kv2.1 (green) and AnkG (magenta). Panels E-H are 2X-magnified images of boxed regions on panels A-D, respectively. Panels A-C: WT mouse brain section. Arrows in panels E-G correspond to same locations on each panel. A: Images of Kv2.1 labeling alone. Note prominent localization of Kv2.1 in large clusters on neuronal somata and proximal dendrites. B: Images of double immunofluorescence labeling for Kv2.1 (magenta) and AnkG. Note prominent clustered localization of Kv2.1 clusters on the AIS (arrows) as revealed by the AnkG labeling. C: Images of AnkG labeling alone. Note that the sites of Kv2.1 clustering on the AIS (arrows) seen in panels A and B occur at sites deficient in AnkG. D: Kv2.1$^{-/-}$ mouse brain section. Note lack of Kv2.1 labeling in Kv2.1$^{-/-}$ brain, and persistence of AnkG-deficient sites on the AIS (arrows). Scale bar on panel B for panels A-D: 10 µm; scale bar on panel F for panels E-H: 5 µm (2X magnified). All images were obtained using Apotome structured illumination microscopy. A red-green version of this figure is available in the main body of the paper as Figure 1.

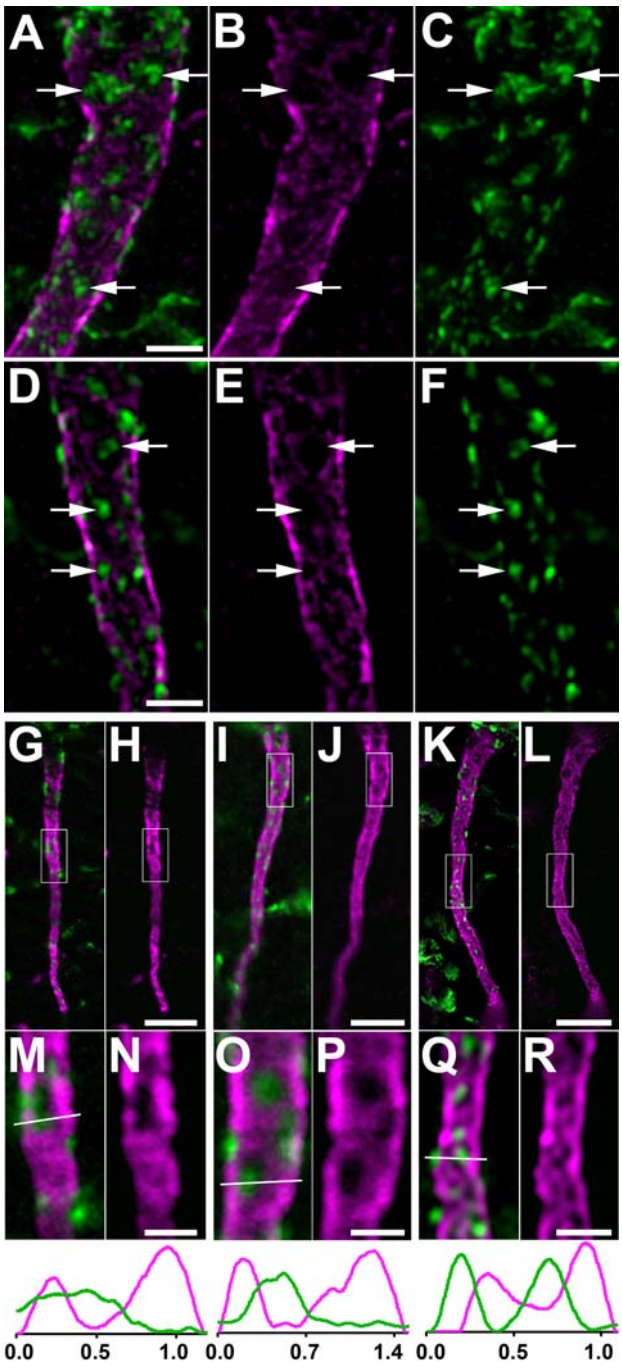
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Figure 2. Kv2.1 is localized at AnkG-deficient sites on the AIS of rat layer 5 neocortical pyramidal neurons. Rat brain sections double immunofluorescence labeled for Kv2.1 (green) and AnkG (magenta). A-F: Images obtained with a Zeiss Elyra super resolution microscope, showing two examples (A-C and D-F) of double labeling (A,D), and the AnkG (B,E) and Kv2.1 (C,F) signals alone. Arrows in panels correspond to same locations on each panel. G-R: Images showing double labeling (G,I,K), and the AnkG signal alone (H,J,L). G,H: Images obtained with a Zeiss Apotome microscope. I,J: Images obtained with an Olympus confocal microscope. K,L: Images obtained with a Nikon N-SIM microscope. Panels below M-R are 4X-magnified images of the area shown in the boxes in panels G-L above. Graphs below panels M-R are histograms of fluorescence intensity across the line drawn on each panel. Scale bar on panel D for panels A-F: 2 µm. Scale bar on panel H for panels G-L: 5 µm. Scale bar on panel H for panels G,H, on panel J for panels I,J, on panel L for panels K,L; on panel N for panels M,N, on panel P for panels O,P, and on panel R for panels Q,R: 1.25 µm. A red-green version of this figure is available in the main body of the paper as Figure 2.

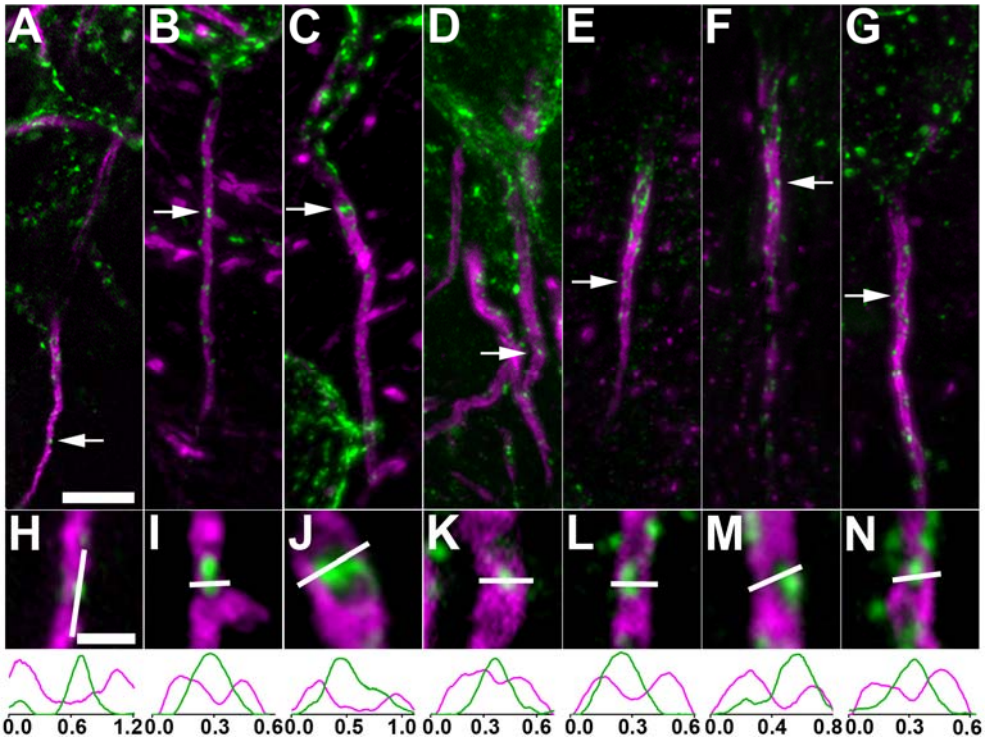

Figure 3. Kv2.1 is localized at AnkG-deficient sites on the AIS of neurons in different regions of rat brain. Rat brain sections double immunofluorescence labeled for Kv2.1 (green) and AnkG (magenta). Images were obtained from neurons in different brain regions. A-D, H-K: hippocampus. A,H: CA1 pyramidal neurons; B,I: a parvalbumin-negative interneuron in *stratum oriens* of CA1; C,J: a parvalbumin-positive interneuron in *stratum oriens* of CA1; D,K: dentate granule cells. E,F,L,M: thalamus. E,L: a neuron in the posterior nucleus; F,M: a neuron in the lateral posterior nucleus. G,N: a medium spiny neuron in the striatum. Arrows in panels correspond to the location of the midpoint of the 4X enlarged insets in panels H-N. Graphs below panels H-N are histograms of fluorescence intensity across the line drawn on each panel. Scale bar on panel A for panels A-G: 5 μm; Scale bar

on panel H for panels H-N: 1 µm (4X magnified). All images were obtained using Apotome structured illumination microscopy. A red-green version of this figure is available in the main body of the paper as Figure 3.

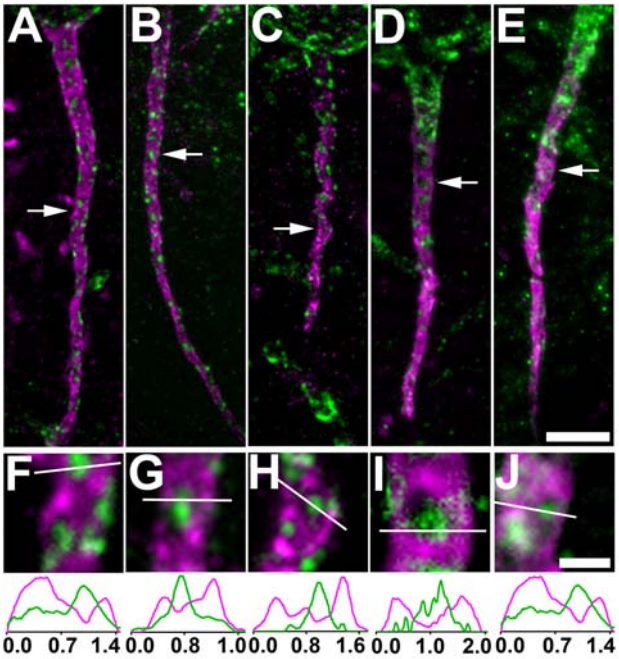

Figure 4. Kv2.1 is localized at AnkG-deficient sites on the AIS of layer 5 neocortical pyramidal neurons in different mammalian species. Sections double immunofluorescence labeled for Kv2.1 (green) and AnkG (magenta). Images were obtained from neocortical neurons in the brains of different mammalian species: A,F: rat; B,G: ferret; C,H: monkey; D,E,I,J: human. Arrows in panels A-E correspond to the location of the midpoint of the 4X enlarged insets shown as panels F-J, respectively. Graphs below panels F-J are histograms of fluorescence intensity across the line drawn on each panel. Scale bar on panel E for panels A-E: 5 µm; Scale bar on panel J for panels F-J: 1 µm (4X magnified). All images were obtained using Apotome structured illumination microscopy. A red-green version of this figure is available in the main body of the paper as Figure 4.