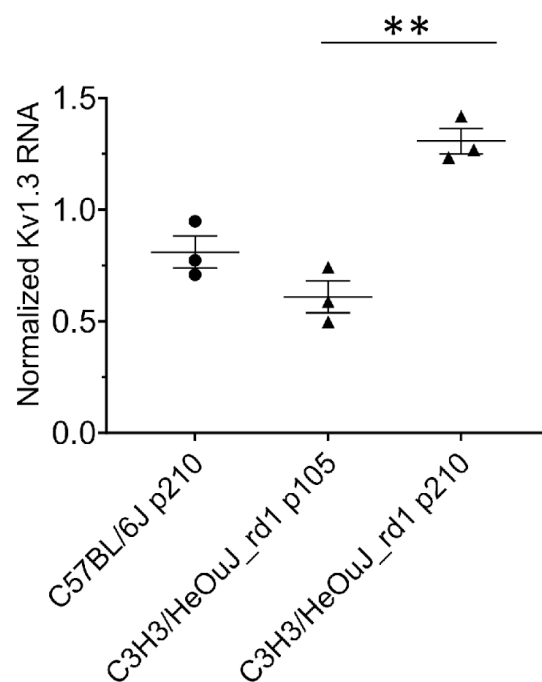
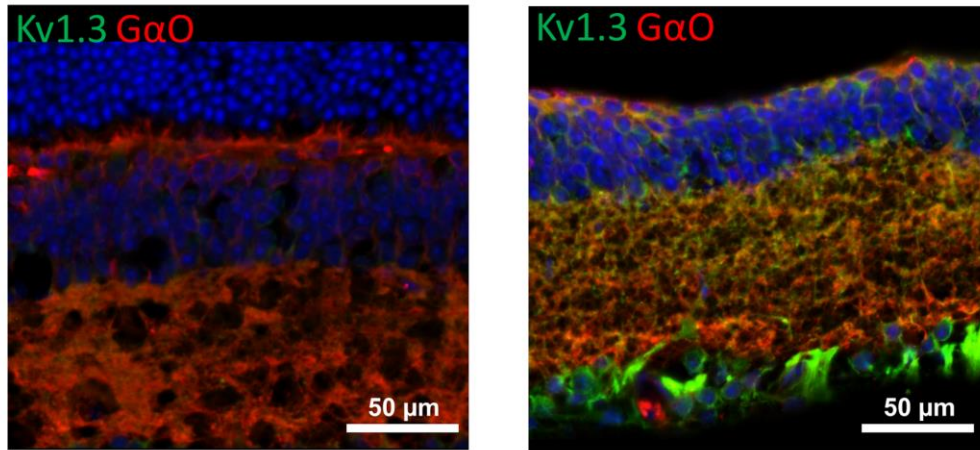


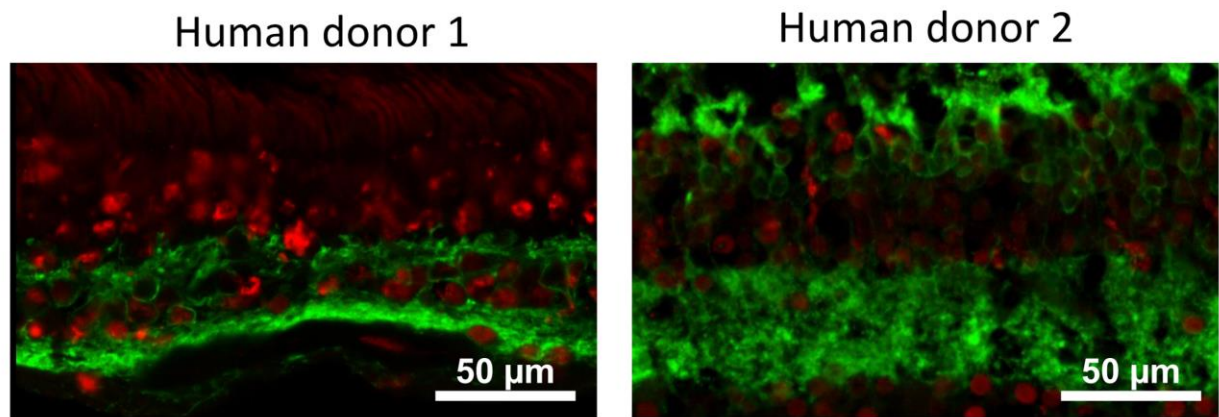
## Supplementary Materials



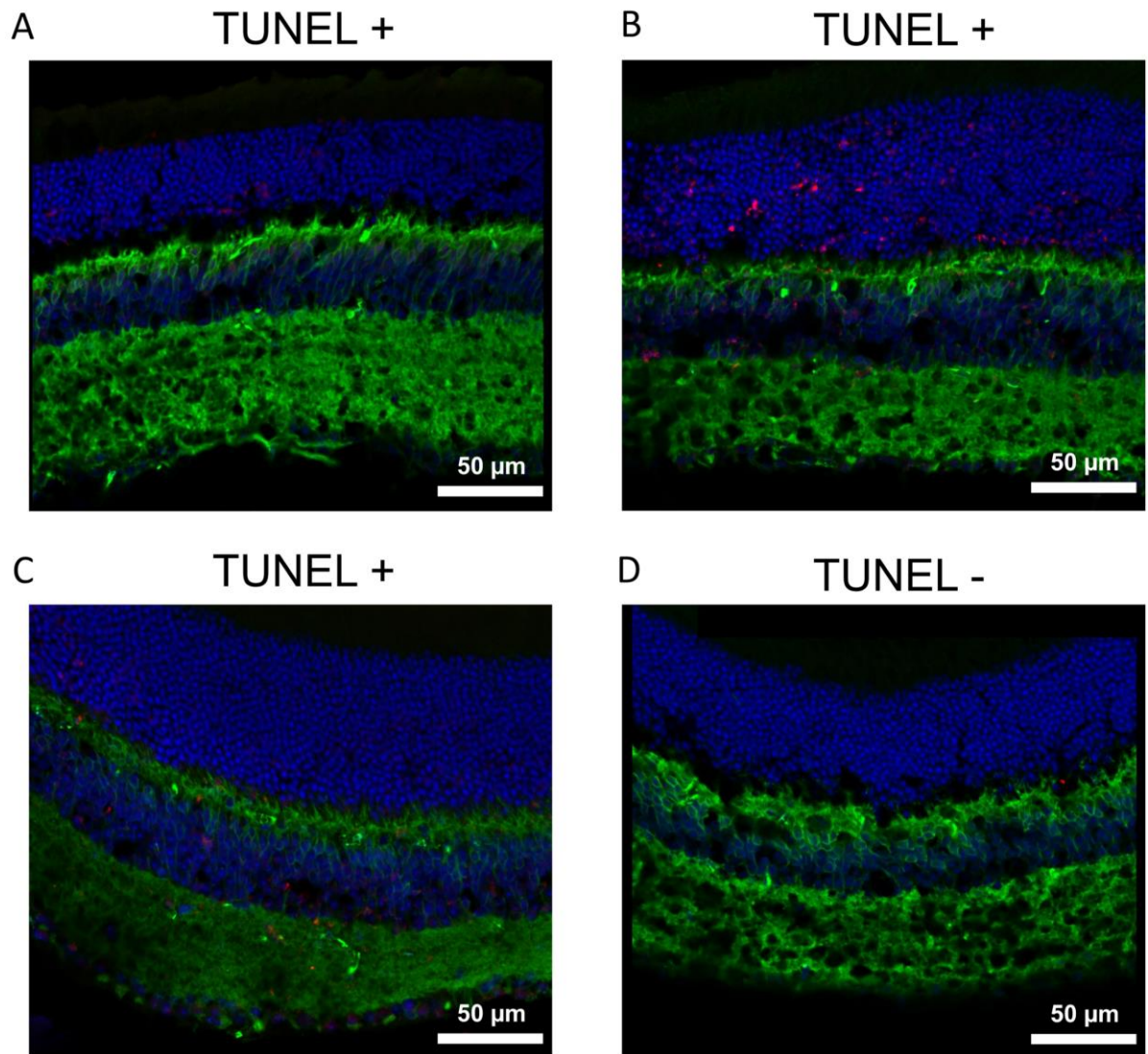
**Figure S1.** Kv1.3 expression increases during degeneration in *C3H3/HeOuJ rd1* mouse model. Kv1.3 channel RNA levels in OBCs from *C57BL/6J* mice (p 210) and *C3H3/HeOuJ rd1* mice (p105) (p210), \*\*p=0.015.



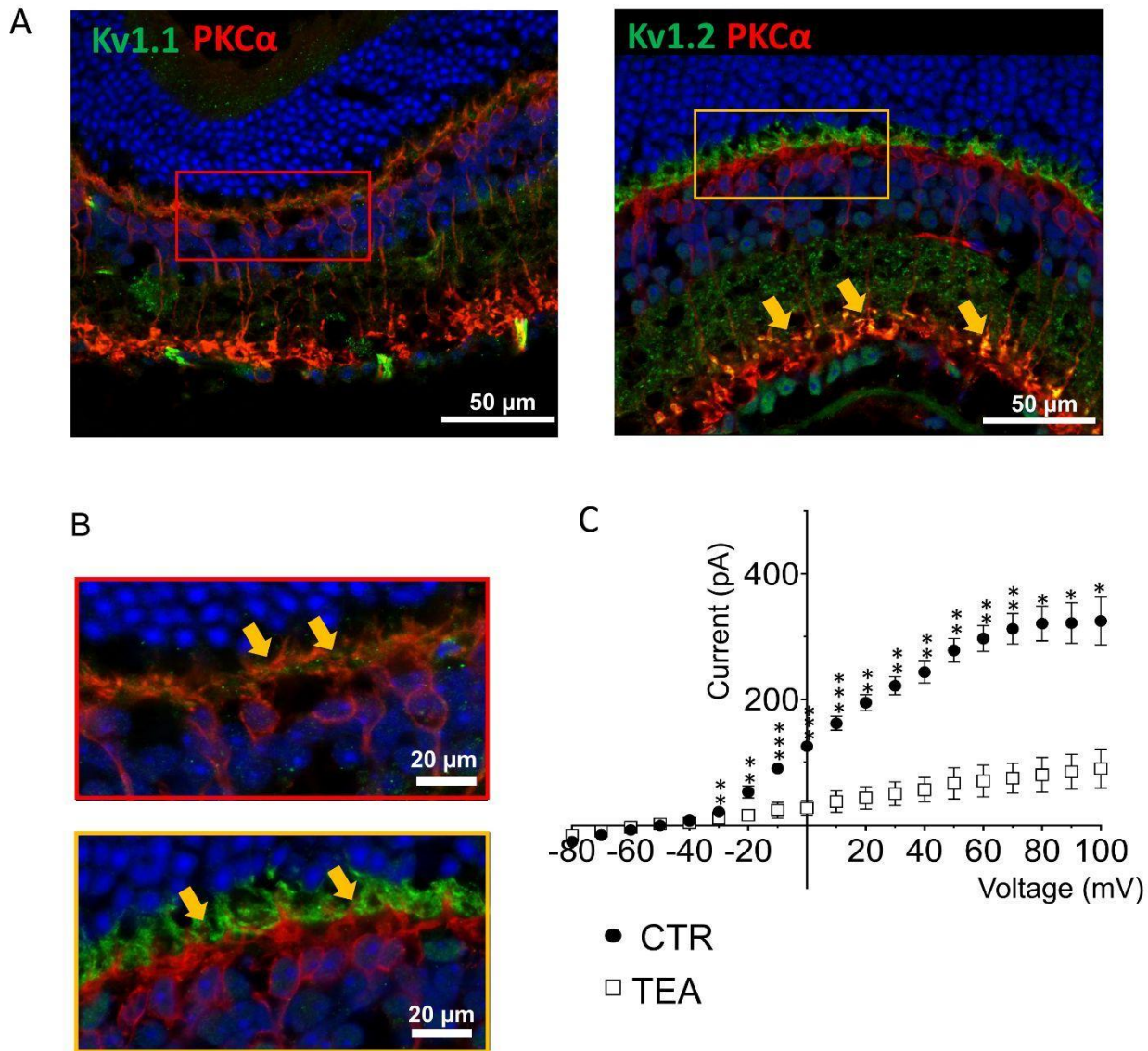
**Figure S2.** Kv1.3 expression increases during degeneration in OBCs. Anti-Kv1.3 immunolabeling (green) on retinal cryosection of *C57BL/6J* mice at p210 (left), *FVB rd1* mice at p210 (right). OBCs were identified by anti-GαO immunolabeling (red). Images were taken as single optical sections (770 nm) on a Zeiss LSM880 confocal microscope (40×, NA: 1.3).



**Figure S3.** TUNEL+ (red) OBCs (green) in the human retina at 0 days of culture from 2 different donors (donor 1 left, donor 2 right). OBCs were stained with anti-GαO immunolabeling. Images were taken as single optical sections (770 nm) on a Zeiss LSM880 confocal microscope (40×, NA: 1.3).

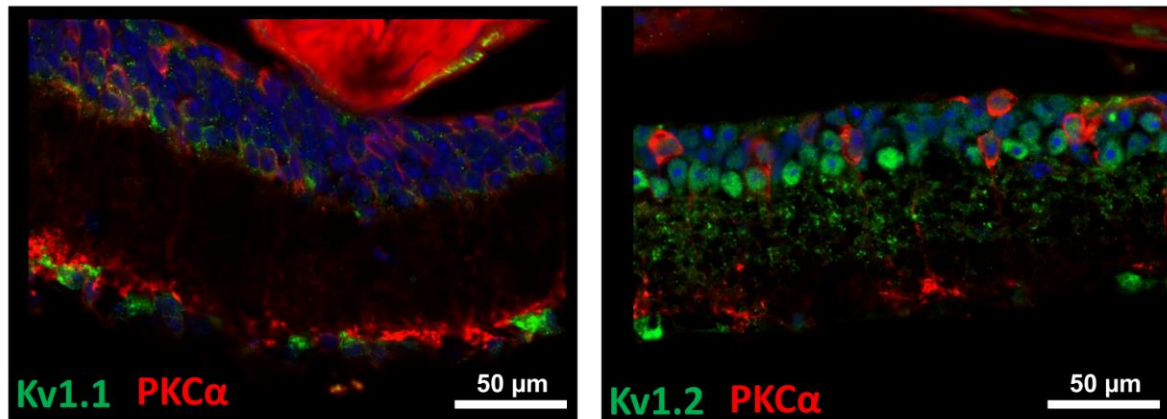


**Figure S4.** (A)(B)(C) TUNEL+ (red) OBCs (green) in *C57BL/6J* retina slice from 3 biological samples; (D) TUNEL - staining as a negative control on *C57BL/6J* retina slice. OBCs were stained with anti-GαO immunolabeling. Images were taken as single optical sections (770 nm) on a Zeiss LSM880 confocal microscope (40×, NA: 1.3).



**Figure S5** Kv1.1 and Kv1.2 are localized in the OBCs dendrites and axon terminals in the healthy mouse retina. (A) anti-Kv1.1 immunolabeling (green) (left) and anti-Kv1.2 (right) on retinal cryosection of *C57BL/6* mice at p210. OBCs were identified by anti-PKC $\alpha$  immunolabeling (red). Images were taken as single optical sections (770 nm) on a Zeiss LSM880 confocal microscope (40 $\times$ , NA: 1.3); (B) Magnification of figure A with Kv1.1 (top) and Kv1.2 (bottom); Kv1.1 is expressed in OBC dendrites and Kv1.2 in OBC dendrites and axon terminals. (C) I/V relationship (step protocol from -80 mV to 100 mV,  $\Delta$  = 10 mV) in control condition (CTR, n= 3) and with the bath application of the potassium channel blocker 10 mM TEA (n=3) (-30 mV, \*\*p=0.0144; -20 mV, \*\*p=0.0037; -10 mV \*\*\*p=0.00033; 0mV \*\*\*p=0.00075; 10mV \*\*p=0.0030; 20mV, \*\*p=0.0037; 30mV, \*\*p=0.0066; 40mV, \*\*p=0.0094; 50mV, \*\*p=0.0091; 60mV, \*\*p=0.0089; 70mV, \*\*p=0.0135; 80mV, \*p=0.0210; 90mV, \*p=0.0267; 100mV, \*p=0.0375);





**Figure S6.** Kv1.1 and Kv1.2 channels expression in OBCs in *FVB rd1* retina. anti-Kv1.1 (left) and anti-Kv1.2 (right) immunolabeling (green) on retinal cryosection of *FVB rd1* mice at p210 (left). ON-RBCs were identified by anti-PKCα immunolabeling (red). Images were taken as single optical sections (770 nm) on a Zeiss LSM880 confocal microscope (40×, NA: 1.3).