Supplementary Information Appendix: Supplementary table, figures and video descriptions

Table S1. Summary of single rod cell recordings. Data are shown as mean ± SD with the number of cells analyzed in parentheses. Abbreviations: I_{dark} – circulating dark current; SPR – single photon response; τ_{rec} – dim flash time constant of recovery; I_o – flash strength that elicited a half-maximal response; τ_{D1} and τ_{D2} – first and second dominant constants of photoresponse recovery from saturating flashes.

	I_{dark}	Dim flash time to peak (ms)	SPR amplitude (pA)	Dim flash τ_{rec} (ms)	Dim flash integration time (ms)	I_o (photons/μm^2)	Saturating flash τ_{D1} (ms)	Saturating flash τ_{D2} (ms)
WT	12.1 ± 0.6 (25)	163 ± 12 (25)	0.86 ± 0.11 (18)	254 ± 10 (25)	385 ± 16 (25)	28 ± 2 (25)	272 ± 14 (16)	854 ± 39 (15)
Prcd$^{-/-}$	12 ± 0.7 (22)	160 ± 9 (22)	0.77 ± 0.08 (18)	230 ± 15 (22)	338 ± 20 (22)	28 ± 2 (22)	250 ± 17 (16)	767 ± 35 (15)

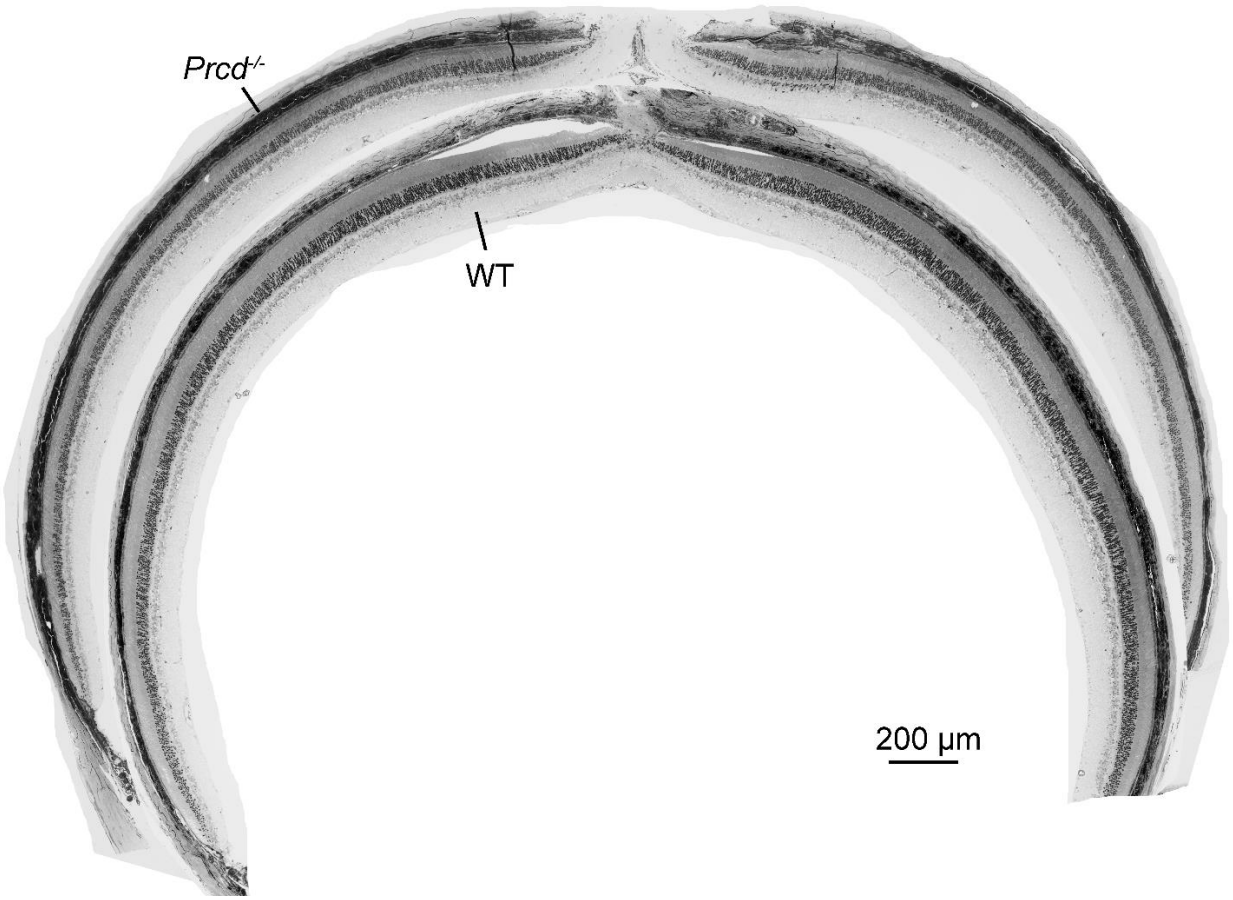

Fig. S1. Representative tile scanned images of the entire retina from 17 months old WT and *Prcd*$^{-/-}$ mice.

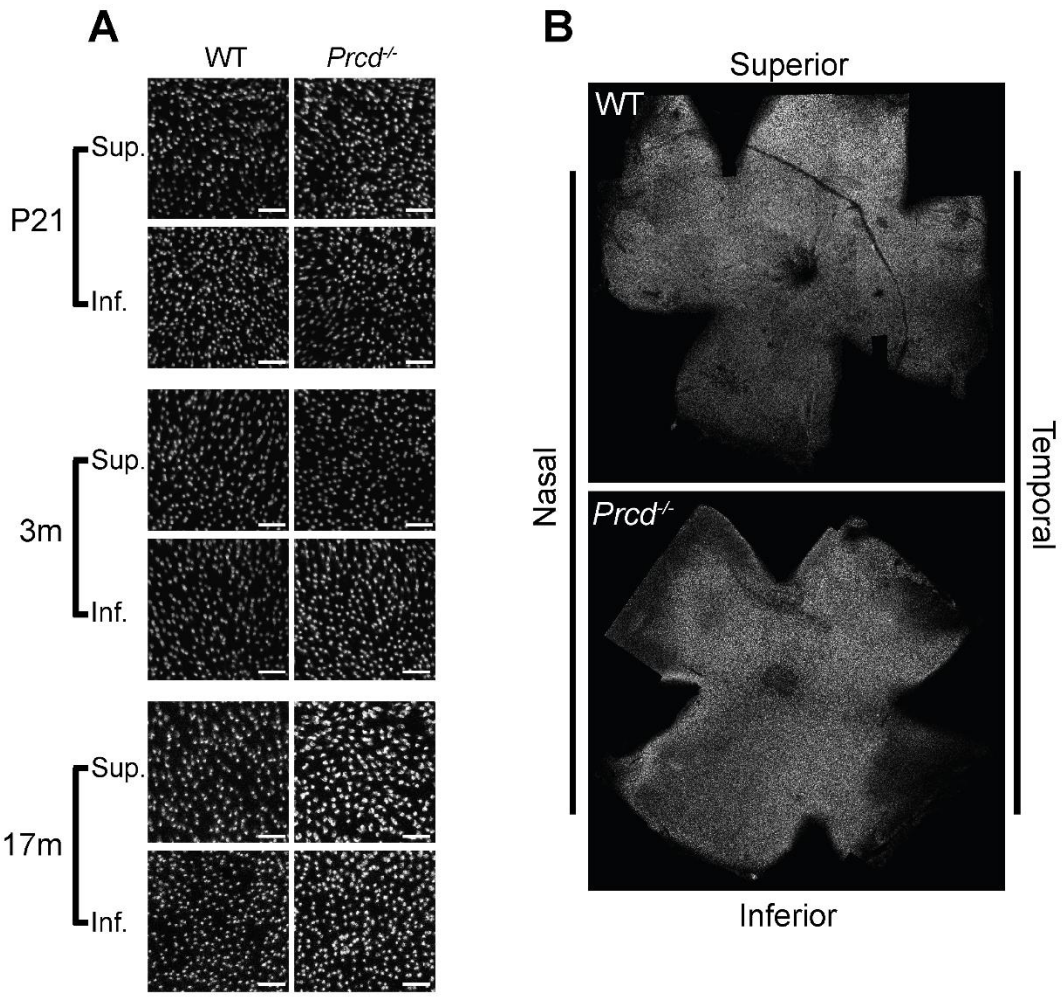

Fig. S2. (A) Representative images taken from superior and inferior regions of retinal flat mounts, oriented with photoreceptors facing up, of WT and *Prcd*$^{-/-}$ mice at various ages which were stained with peanut agglutinin (PNA) to label cones. Scale bars are 20 µm. (B) Representative tile scanned images showing the entire retinas of the same flat mounts described in (A).

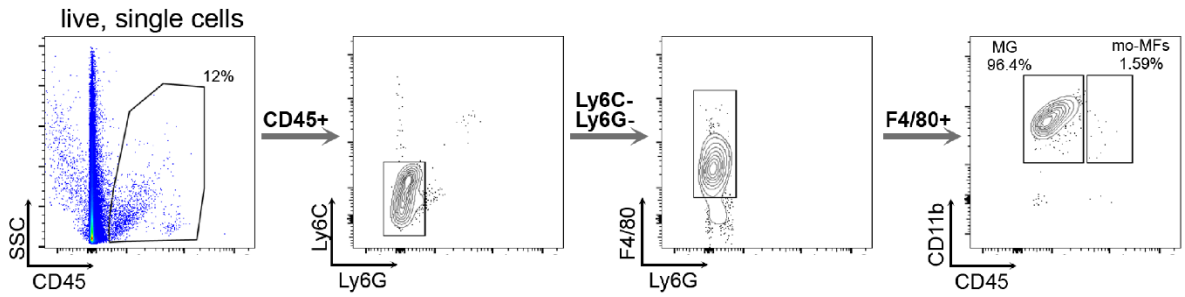

Fig. S3. Gating strategy of microglia (MG) and monocyte-derived macrophages (mo-MFs) for flow cytometry of retina cell suspensions prepared from 4 months old WT and *Prcd*$^{-/-}$ mice. Viable singlets were sequentially gated through CD45^{+}, Ly6C^{-}, Ly6G^{-}, F4/80^{+}, CD11b^{+} CD45^{lo}/CD45^{hi}. MG are defined as CD45^{lo} CD11b^{+} F4/80^{+} Ly6C^{-} Ly6G^{-}, while mo-MFs as CD45^{hi} CD11b^{+} F4/80^{+} Ly6C^{-} Ly6G^{-}.

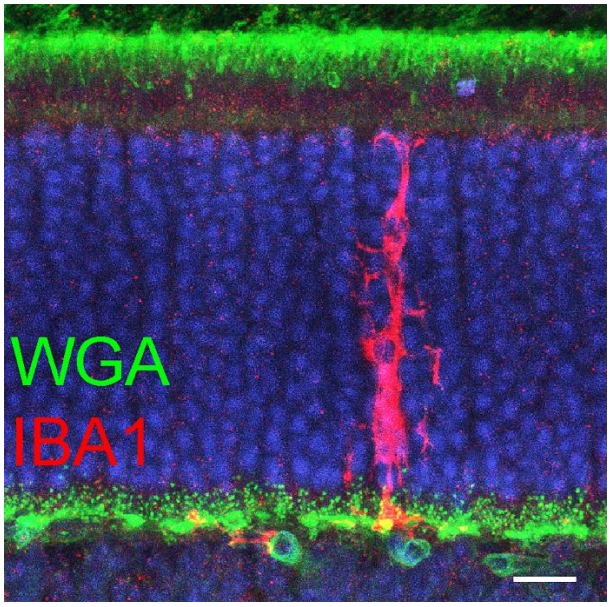

Fig. S4. Microglia immunostaining in a cross-section of *Prcd*$^{-/-}$ mouse retina at P21 with the microglial marker IBA1 in red and wheat germ agglutinin (WGA) in green. The image represents a maximum intensity projection. Scale bar is 10 µm.

Supplementary video descriptions

Video 1. The video displays, frame by frame, each ~1 nm section of a 3D tomogram of the WT photoreceptors shown in Fig. 7 over a thickness range of ~100 nm. The tomogram was taken at the site of photoreceptor disc morphogenesis and shows newly forming discs.

Video 2. The video displays, frame by frame, each ~1 nm section of a 3D tomogram of the *Prcd*$^{-/-}$ photoreceptor shown in Fig. 7 over a thickness range of ~100 nm. The tomogram was taken at the site of photoreceptor disc morphogenesis and shows newly forming discs.

Video 3. A video showing a 3D rendering of a segmented tomogram taken from a *Prcd*$^{-/-}$ mouse at the site of disc morphogenesis (see also Fig. 7 and Video 2) over an ~100 nm thickness. The membranes of newly forming discs are highlighted in blue (extracellular surface) and yellow (intracellular surface). Extracellular vesicles are highlighted in green.

Video 4. A video representing a 3D reconstruction of the confocal image of two microglial cells shown in the left panel of Fig. 9A, taken at the inner-outer segment junction in *Prcd*$^{-/-}$ mice. The microglial marker P2YR12 is shown in red, lysosomal marker CD68 in purple, and photoreceptor outer segments are labeled with wheat germ agglutinin (WGA) in green. Nuclei were stained with Hoechst in blue.

Video 5. A video representing a 3D reconstruction of the confocal image of a microglial cell shown in the right panel of Fig. 9A, taken at the inner-outer segment junction in *Prcd*$^{-/-}$ mice. The microglial marker P2YR12 is shown in red, lysosomal marker CD68 in purple, and photoreceptor outer segments are labeled with wheat germ agglutinin (WGA) in green. Nuclei were stained with Hoechst in blue.