Supporting Information

Cao et al. 10.1073/pnas.1202332109

Flash intensity (100 cd*s/m2)

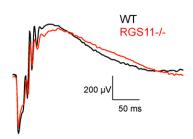


Fig. S1. RGS11-knockout mice display normal light responses as measured by electroretinography. A representative trace is shown out of four total experiments conducted with different mice, all yielding similar results.

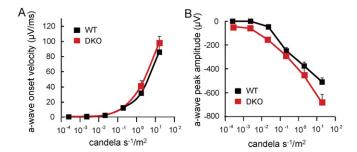


Fig. S2. Normal photoreceptor function in DKO mice as evidenced by the analysis of the ERG a-wave. ERGs were performed and analyzed as described in *Materials and Methods*. (A) The speed of the a-wave onset, which reflects the signal amplification of the phototransduction cascade, was indistinguishable between WT and DKO mice. (B) The amplitude of the a-wave was slightly larger in DKO mice consistent with the "unmasking" effect due to the much delayed onset of the b-wave that normally blunts a-wave generation.

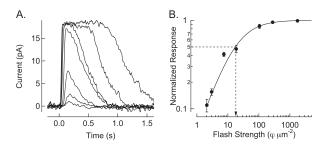


Fig. S3. Normal photoreceptor function in DKO mice as evidenced by the single cell suction electrode recordings. (A) Measurements of rod outer segment current made with suction electrodes reveal that the magnitude of the dark current and the response sensitivity in DKO rods is indistinguishable from WT rods. A 30-ms flash was delivered at time = 0 s. The average dark current from six DKO rods from one mouse was 17 ± 0.6 pA. (B) The average response-intensity relationship for six DKO rods is shown. The data were fit with a Hill curve whose exponent was fixed to a value of 1. The half-maximal flash strength of the fit was 18 photon μ m², within the range of WT rods from many other studies that record from rods under the same conditions (1–3).

- 1. Dunn FA, Doan T, Sampath AP, Rieke F (2006) Controlling the gain of rod-mediated signals in the Mammalian retina. J Neurosci 26:3959–3970.
- 2. Okawa H, et al. (2010) Optimal processing of photoreceptor signals is required to maximize behavioural sensitivity. J Physiol 588:1947–1960.
- 3. Sampath AP, et al. (2005) Recoverin improves rod-mediated vision by enhancing signal transmission in the mouse retina. Neuron 46:413–420.

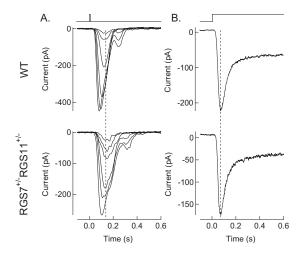


Fig. 54. Normal rod ON-BC light-evoked responses in RGS7^{+/-}RGS11^{+/-} mice. Light-evoked responses were measured from WT and RGS7/RGS11 double heterozygote rod ON-BCs. Responses of WT and RGS7^{+/-}RGS11^{+/-} rod ON-BCs to a brief flashes (*A*) yielding 0.4, 0.7, 1.5, 2.9, 5.9, and 11 Rh* per rod, and responses to a bright step (*B*) yielding 2,400 Rh* per rod per s both displayed magnitudes and time courses that were identical to WT rod ON-BCs. The timing of the stimulus is provided by the upper bar above. Dashed vertical lines are provided to compare the time course of light-evoked responses between these genotypes. The time-to-peak of the dim flash response (*A*) in RGS7^{+/-}RGS11^{+/-} rod ON-BCs was 156 ± 6.4 ms from five cells across two mice, and in WT rod ON-BCs was 154 ± 4.2 ms for nine cells across two mice. Note that that WT cells were the same as those used in Fig. 4. Step responses (*B*) of RGS7^{+/-}RGS11^{+/-} rod ON-BCs were representative of five cells collected from two mice, and in WT rod ON-BCs were representative of seven cells from one mouse.