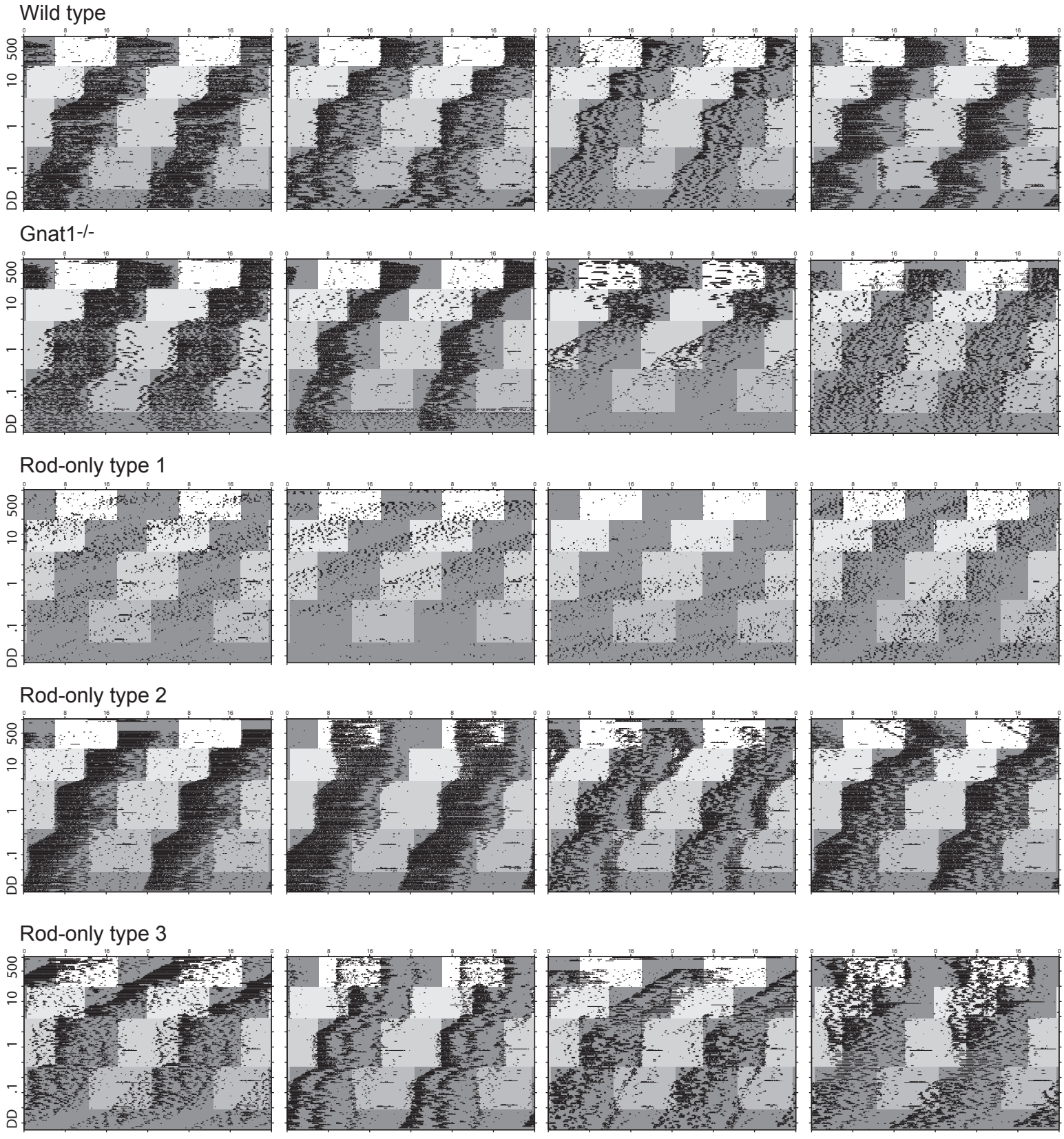
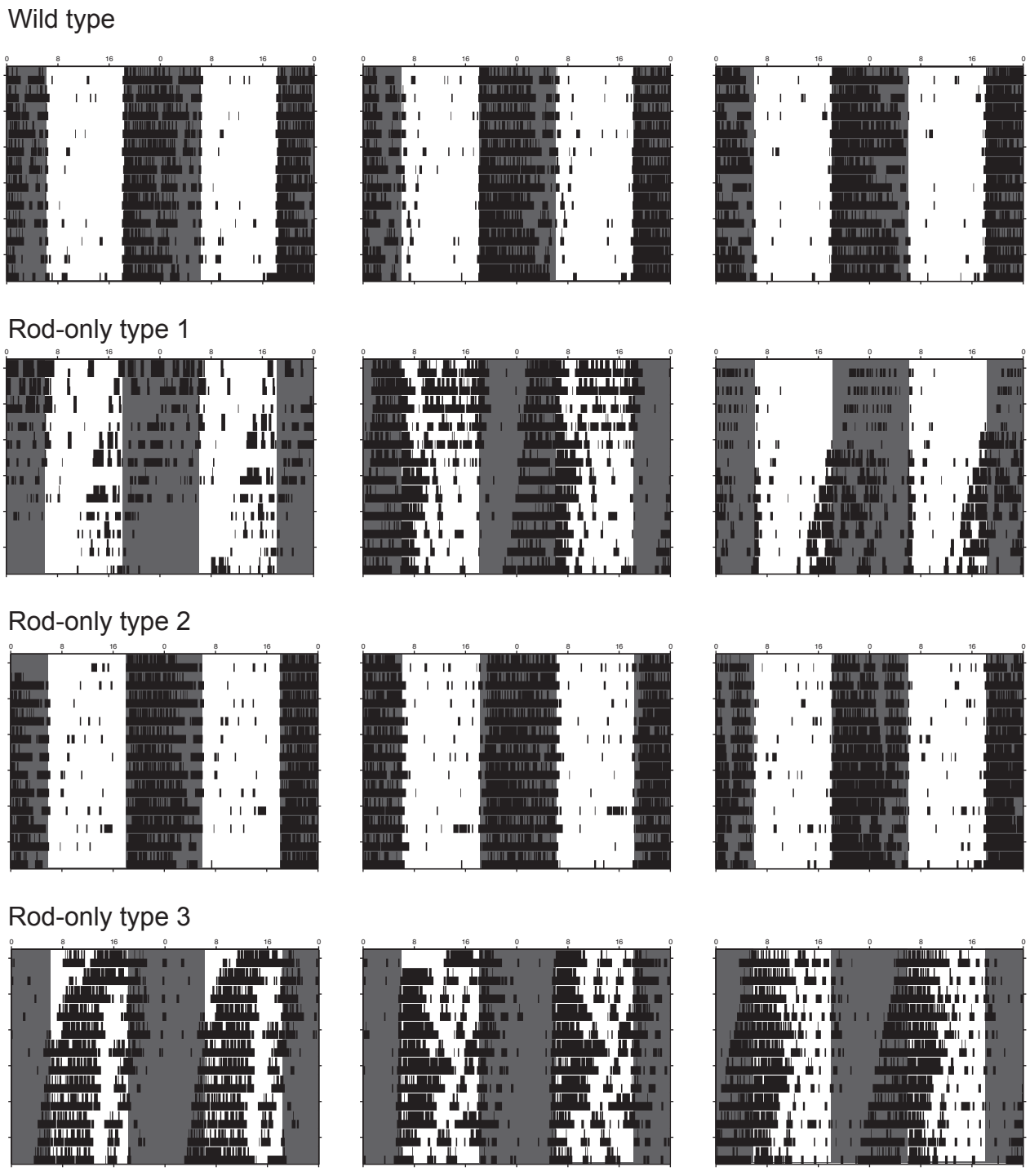
Rod photoreceptors drive circadian photoentrainment across a wide range of light intensities

Altimus, C.M., Güler, A.D., Alam, N.M., Arman, A.C., Prusky, G.T., Sampath, A.P., Hattar, S

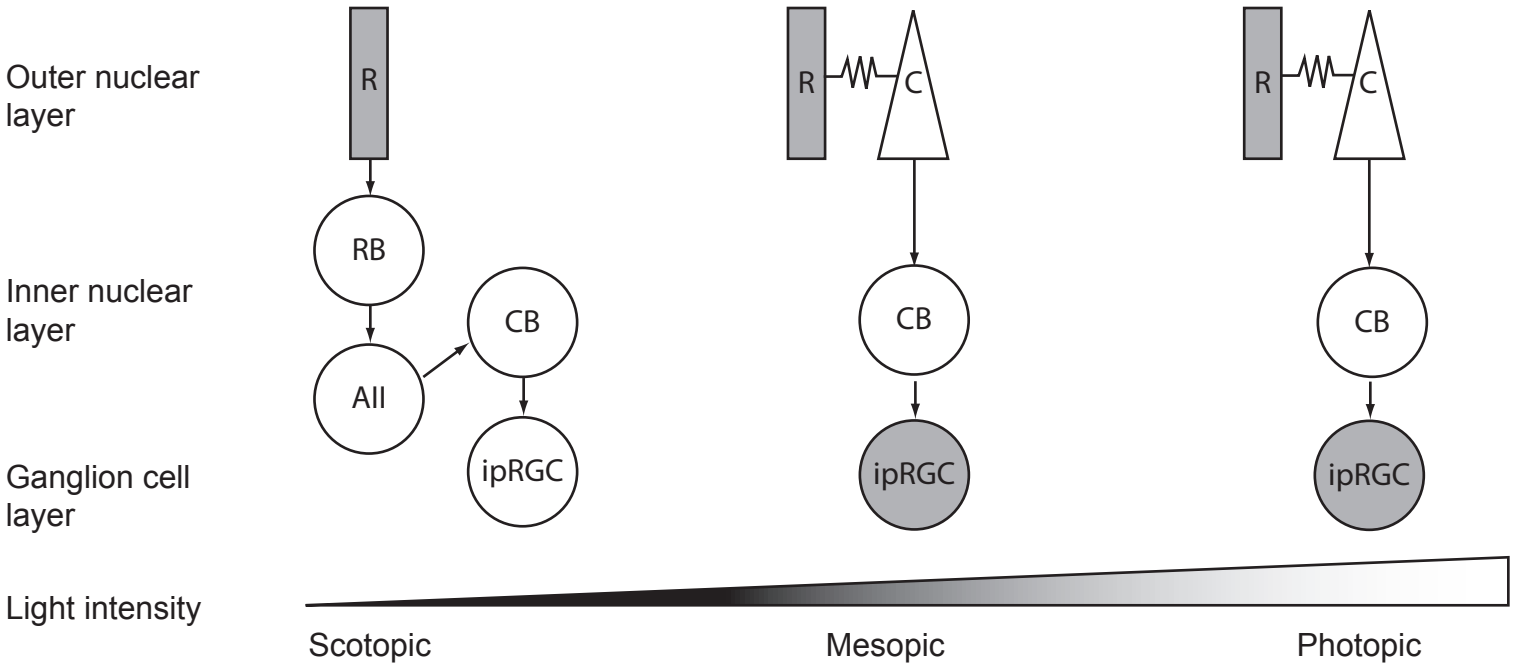


Supplemental Figure 1: Rods drive photoentrainment across a wide range of light intensities

Three representative actograms are shown for each genetic mouse line that we used in experiments conducted in Figure 1.



Supplemental Figure 2: Photoentrainment of rod–only animals at high light intensity
Three representative actograms are shown for each rod–only genotype at high light intensity (500 lux) without any prior light cycle or intensity perturbations. These records demonstrate that rod–only type 1 and type 3 animals are unable to photoentrain at high light intensity while rod–only 2 animals photoentrain similar to WT animals (see Table 1).



Supplemental Figure 3: Model describing the role of retinal photoreceptors and circuitry for photoentrainment Schematic of pathways contributing to photoentrainment across light intensities. At scotopic light levels, rods utilize the rod bipolar pathway providing the only functional light input to ipRGCs for circadian photoentrainment as shown by the Gnat1–/– mice. At mesopic and photopic light intensities, the rod bipolar pathway is unable to compensate for the loss of melanopsin protein for photoentrainment as evidenced by the rod–only type 3 mice. In these situations rods utilize the rod–cone pathway for photoentrainment. In schematic, grey depicts cells involved in light detection and white cells are cells involved in light transmission; relative light intensity is indicated on lower gradient. Abbreviations: C: cone, R: rod, CB: cone bipolar, RB: rod bipolar, AII: AII amacrine, ipRGC: intrinsically photosensitive retinal ganglion cell.