Supplementary Information

Optogenetic control of the canonical Wnt signaling pathway during *Xenopus laevis* embryonic development

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Figure S1: Flow cytometry analysis of HEK293T cells co-transfected with β-catenin-mRuby2 and optoLRP6opt (or CIBN-GFP-CaaX for the negative control).

Figure S2: Comparison of optoLRP6opt and CRY2-mCh-LRP6c in mammalian cells and *Xenopus laevis* embryos.

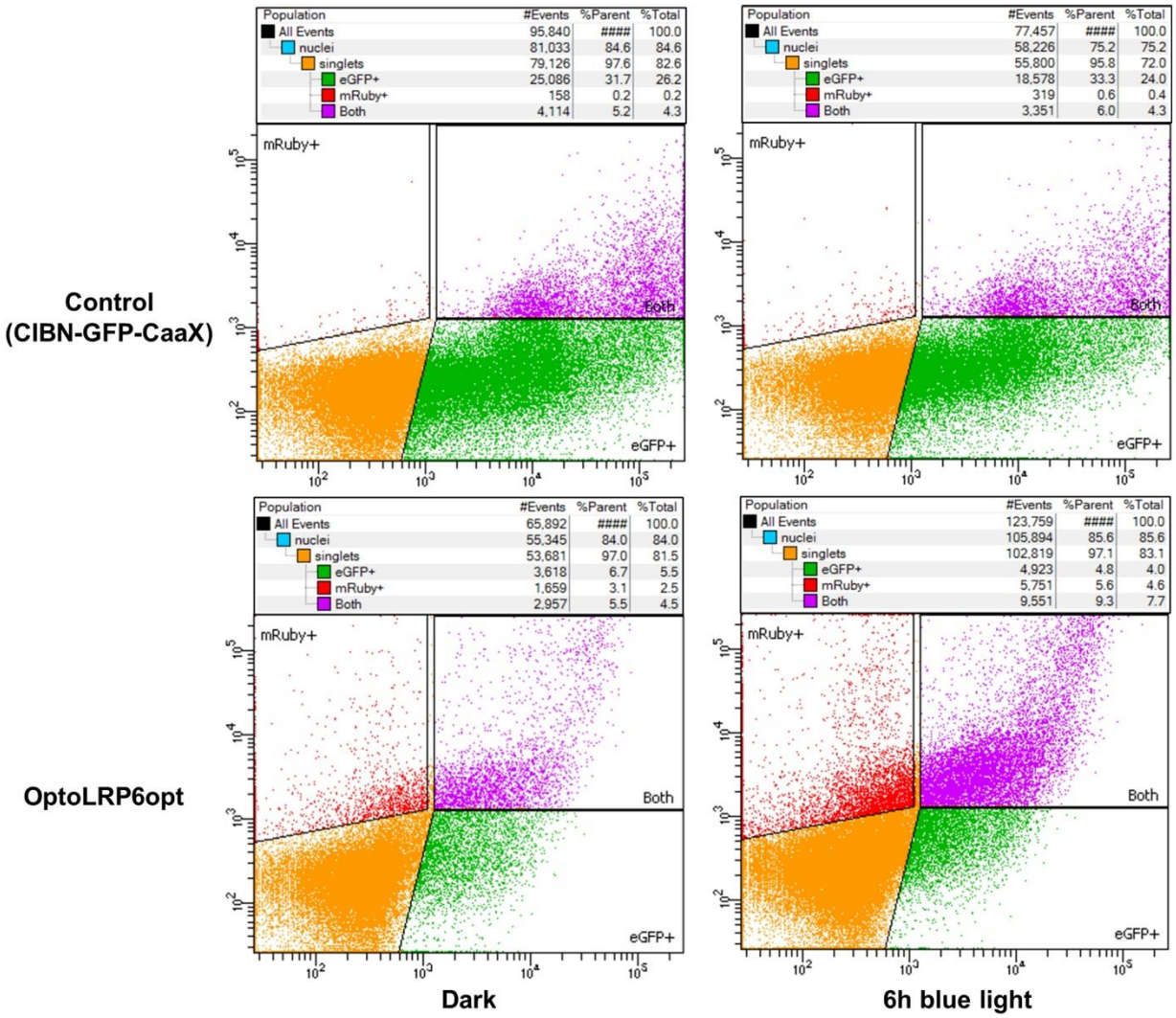

Figure S1: Flow cytometry analysis of HEK293T cells co-transfected with β-catenin-mRuby2 and optoLRP6opt (or CIBN-EGFP-CaaX for the negative control). Cells were categorized into different groups, including non-transfected (orange), β-catenin-mRuby2 singly transfected (red), optoLRP6opt (or CIBN-EGFP-CaaX) singly transfected (green), or doubly-transfected (pink). These cells were then used to calculate results related to Figure 2 (d) and (e). Data at 0 h (Dark) and 6 h blue light stimulation were shown.

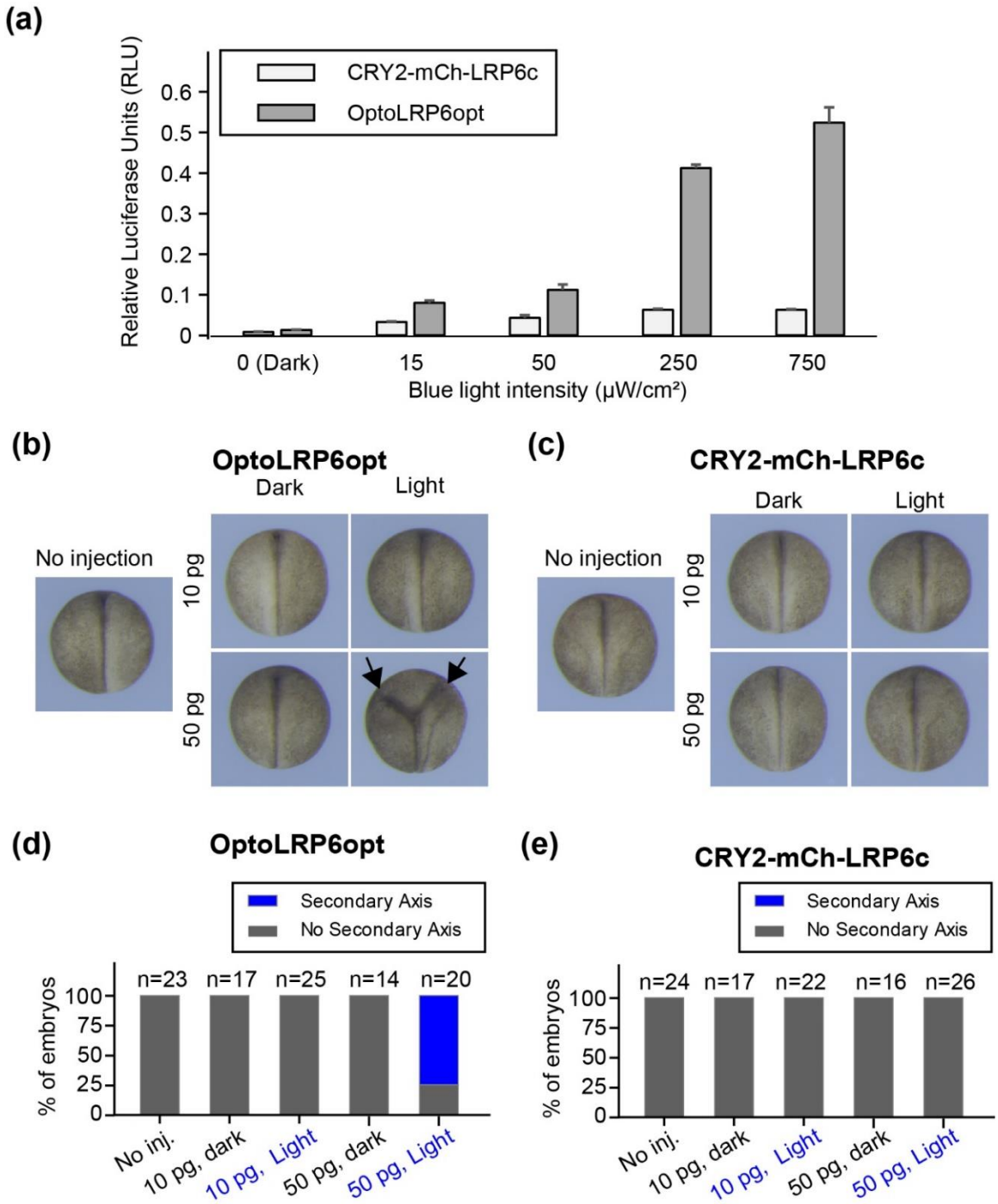

Figure S2: **Comparison of optoLRP6opt and CRY2-mCh-LRP6c in mammalian cells and *Xenopus laevis* embryos.** (a) HEK293T cells in 35mm dishes were transfected with 100ng of CRY2-mch-LRP6 or OptoLRP6opt alongside 100ng TopFlash reporter and 100 ng control luciferase reporter. 3h after transfection, the cells were illuminated for 24h at the indicated intensities of blue light. Values represent mean ± s.d. of three biological replicates (n=3). (b) Dose-dependent blue light-activated OptoLRP6opt-injected, but not CRY2-mCh-LRP6c-injected (c), embryos examined at the neurula stage show two body axes (arrows). Quantification of axis duplication in embryos ventrally injected with optoLRP6opt (d) and CRY2-mCh-LRP6c (e). The number of embryos used for each condition is marked above the bars.