

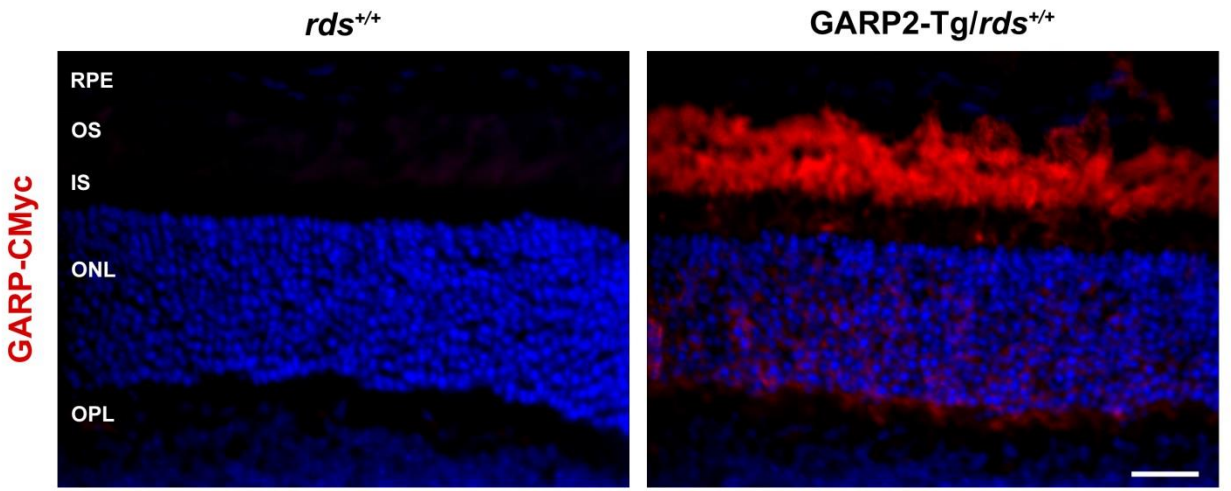
SUPPLEMENTARY INFORMATION

Antigen	Antibody	Species	Source	References
RDS	RDS-CT	Rbt-PC	In house	1, 2
RDS	mAB 2B7	Ms-MC	In house	3, 4
ROM-1	ROM1-CT	Rbt-PC	In-house	1, 2
ROM-1	mAB 2H5	Ms-MC	In-house	3, 4
Rhodopsin	mAB 1D4	Ms-MC	Dr. Robert Molday	5, 6
CNGB1, GARP1 GARP2	mAB 4B1	Ms-MC	Dr. Robert Molday	7
S-opsin	S-opsin	Rbt-PC	In-house	8
S-opsin	OPN1SW (N-20)	Gt-PC	Santa Cruz Biotechnology, cat# sc-14363	4
M-opsin	Opsin 1 (Medium Wave)	Rbt-PC	Novus Biologicals cat# 110- 74730	
CNGB1 GARP1 GARP2 (N- terminal)	CNGB1-Ab	Rbt-PC	Dr. Steven Pittler,	9
Myc	Myc-tag (9B11)	Ms-MC	Cell Signaling cat# 2276S	10

Supplementary Table S1. Antibodies used for immunofluorescence (IF) and western blotting (WB).

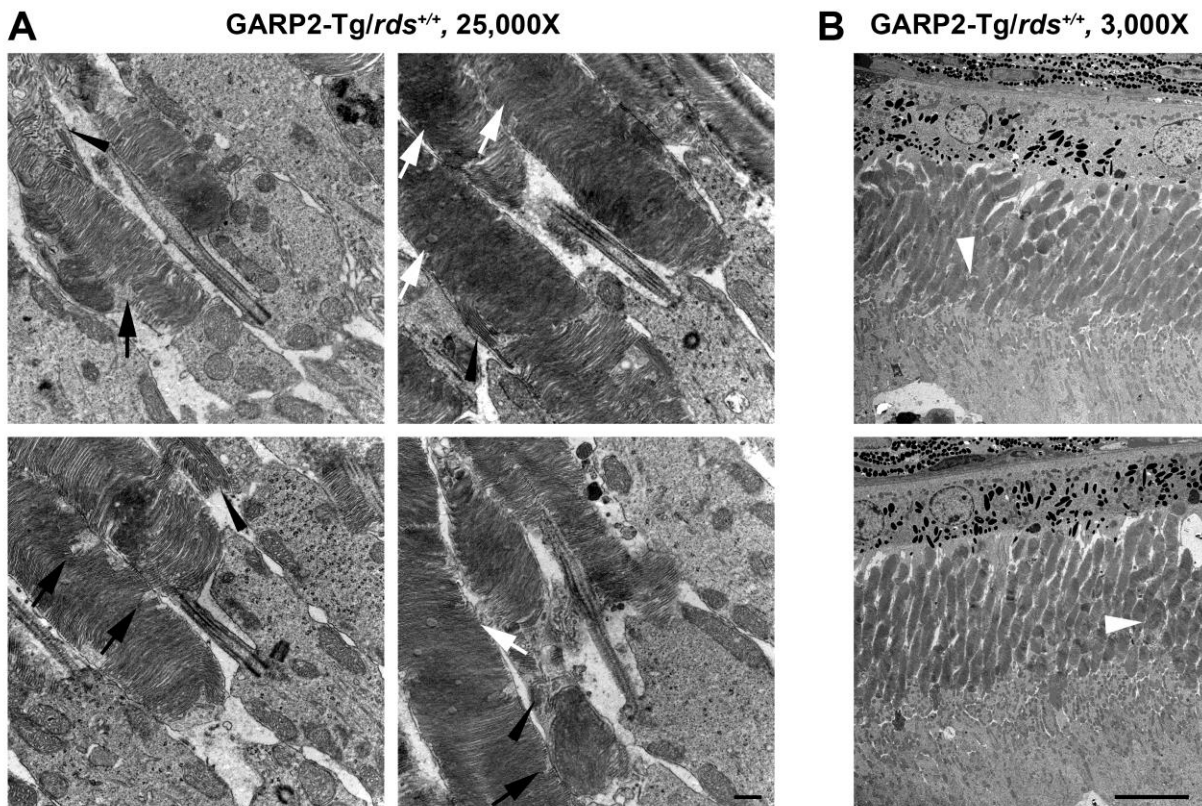
Rbt-PC: rabbit polyclonal, Ms-MC: mouse monoclonal, Gt-PC: goat polyclonal.

Supplementary Figure S1



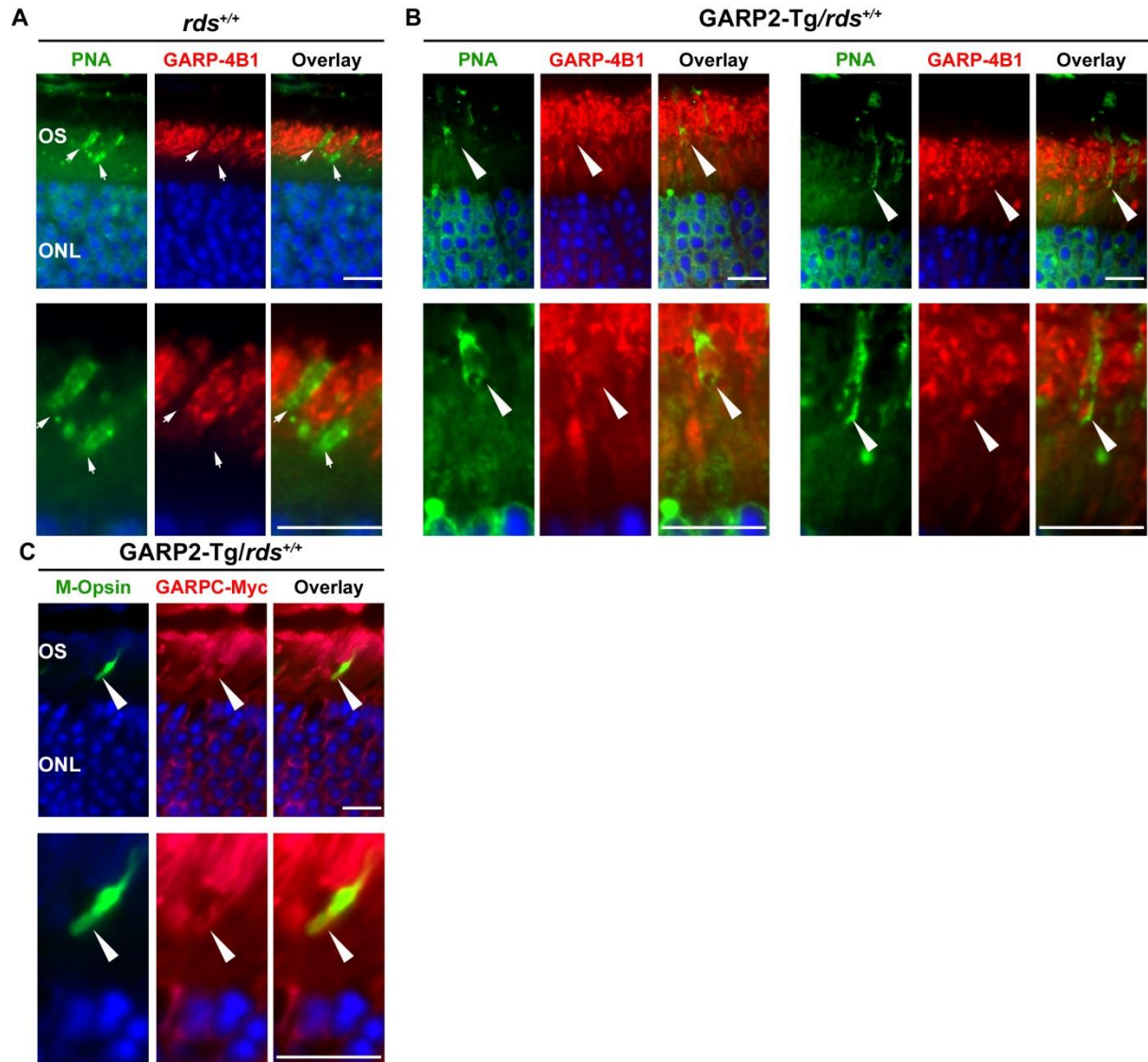
Supplementary Figure S1. GARP2-Tg protein accumulates throughout the photoreceptor. Retinal sections harvested at P30 from the indicated genotypes were IF labeled (red) using a myc antibody which is specific to transgenic GARP2. RPE: retinal pigment epithelium, OS: outer segment, IS: inner segment, ONL: outer nuclear layer, OPL: outer plexiform layer. Scale bar: 25 μ m.

Supplementary Figure S2



Supplementary Figure S2. GARP2-Tg induces abnormalities in OS ultrastructure. Shown are additional transmission EM images from P30 GARP2-Tg/*rds*^{+/+} retinas captured at either 25,000x (**A**) or 3,000x (**B**). Black arrows highlight regions wherein OS discs do not reach the plasma membrane. Black arrowheads show regions of abnormal disc alignment. White arrows show normal OS. White arrowheads show whorl OSs. Scale bars: 500 nm (**A**) and 10 μ m (**B**).

Supplementary Figure S3



Supplementary Figure S3. Some cone photoreceptors express GARP2-Tg. Retinal sections from *rds*^{+/+} and *GARP2-Tg/rds*^{+/+} were co-labeled with GARP-4B1 (red) and the cone matrix sheath marker peanut agglutinin (PNA-green) in (A, B), and C-Myc (red) and M-opsin (green) in (C). Nuclei in all sections were counterstained with DAPI. Arrows indicate cones in that do not have detectable GARP-4B1/C-Myc immunoreactivity. Arrowheads show cones that do display GARP-4B1/C-Myc immunoreactivity. Areas shown by arrows in the top row are expanded in the bottom row in each panel. Shown are single planes from a confocal stack. Scale bar 10 μ M. OS: outer segments, ONL: outer nuclear layer.

Supplementary References

1. Chakraborty D, Ding XQ, Conley SM, Fliesler SJ, Naash MI. Differential requirements for retinal degeneration slow intermolecular disulfide-linked oligomerization in rods versus cones. *Human molecular genetics* 2009;18:797-808.
2. Chakraborty D, Ding XQ, Fliesler SJ, Naash MI. Outer segment oligomerization of Rds: evidence from mouse models and subcellular fractionation. *Biochemistry (Mosc)* 2008;47:1144-1156.
3. Conley SM, Stuck MW, Burnett JL, et al. Insights into the mechanisms of macular degeneration associated with the R172W mutation in RDS. *Human molecular genetics* 2014;23:3102-3114.
4. Stuck MW, Conley SM, Naash MI. The Y141C knockin mutation in RDS leads to complex phenotypes in the mouse. *Human molecular genetics* 2014.
5. Chakraborty D, Conley SM, Al-Ubaidi MR, Naash MI. Initiation of Rod Outer Segment Disc Formation Requires RDS. *PLoS One* 2014;9:e98939.
6. MacKenzie D, Arendt A, Hargrave P, McDowell JH, Molday RS. Localization of binding sites for carboxyl terminal specific anti-rhodopsin monoclonal antibodies using synthetic peptides. *Biochemistry (Mosc)* 1984;23:6544-6549.
7. Poetsch A, Molday LL, Molday RS. The cGMP-gated channel and related glutamic acid-rich proteins interact with peripherin-2 at the rim region of rod photoreceptor disc membranes. *The Journal of biological chemistry* 2001;276:48009-48016.
8. Chakraborty D, Conley SM, Stuck MW, Naash MI. Differences in RDS trafficking, assembly and function in cones versus rods: insights from studies of C150S-RDS. *Human molecular genetics* 2010;19:4799-4812.
9. Zhang Y, Molday LL, Molday RS, et al. Knockout of GARPs and the beta-subunit of the rod cGMP-gated channel disrupts disk morphogenesis and rod outer segment structural integrity. *J Cell Sci* 2009;122:1192-1200.
10. Kanan Y, Brobst D, Han Z, Naash MI, Al-Ubaidi MR. Fibulin 2, a tyrosine O-sulfated protein, is up-regulated following retinal detachment. *The Journal of biological chemistry* 2014;289:13419-13433.