

Supplemental Data:

Table 1. Differentially-expressed genes at 72hrs after light onset, rank ordered by log₂ difference in average fluorescence intensity between control and experimental chips (see column M).

Supplemental Figure 1. Housing pigmented zebrafish to intense bright fluorescent light induces photoreceptor loss followed by regeneration.

Panels a-e illustrate Nissl-stained sections from control retina (a) and retinas exposed to bright, constant light for 24hrs (b), 72hrs (c), 10 days or (d) 10 days following by 18 days of recovery. Panels f-g illustrate quantitative measurements of the photoreceptor, outer nuclear and rod nuclear layers, respectively (see panel a), normalized to the thickness of the inner nuclear layer. Note that there is a significant decrease in the thickness of the various layers starting at 72h of light exposure. Panels i-k illustrate analysis of *rhodopsin*, *red opsin* and *PCNA* expression by quantitative real-time PCR. ROS, rod outer segments; OLM, outer limiting membrane; OPL, outer plexiform layer; IPL, inner plexiform layer; ONL, outer nuclear layer; INL, inner nuclear layer; GCL, ganglion cell layer; PL, photoreceptor layer; rod ONL, rod outer nuclear layer. Scale bar equals 50µm, * p<0.05, **p<0.01.

Supplemental Figure 2. Sense probes do not produce specific cellular labeling. Panels a-d illustrate *in situ* hybridizations comparing *mdka* antisense (a, c) and sense (b, d) probes. Panels a and b are from a 96hpf larva and panels

c and d are from an adult retina. Panels e-f illustrate *in situ* hybridizations comparing *mdkb* antisense (e, g) and sense (f, h) probes. Panels e and f are from a 96hpf larva, whereas panels g and h are from an adult. Arrows and arrowheads illustrate specific cellular expression when using antisense probes. GCL – ganglion cell layer; INL – inner nuclear layer; ONL – outer nuclear layer.

Supplemental Figure 3. In the adult retina *mdka* or *mdkb* is not expressed in dividing cells. Panels a and d illustrate *in situ* hybridizations that show the cellular expression of *mdka* and *mdkb*, respectively, in the adult retina. Panels b and e are the same sections as in a and d, following immunostaining with antibodies against PCNA, and illustrate PCNA-positive cells (rod progenitors) (arrowheads) within the outer nuclear layer. Panels c and f are digital overlays. Note that the PCNA immunostaining does not co-localize with the expression of midkines. ONL – outer nuclear layer; INL – inner nuclear layer; GCL – ganglion cell layer.

Supplemental Figure 4. Time course of *mdka* and *mdkb* expression during and after the light lesion. Panels a-h illustrate the time course of the injury-induced expression of *mdka*, whereas panels i-p illustrate the time course of the injury-induced expression of *mdkb*. Note that the expansion of *mdkb* expression into the vitreal inner nuclear layer begins by 24hrs after light onset (cf. panel l with Fig. 5a) and returns to normal only at 14 days after the onset of the light exposure. In contrast, the expression of *mdka* varies relatively little over the

same time course. onl, outer nuclear layer; inl inner nuclear layer; gcl, ganglion cell layer. Scale bar equals 50 μ m.

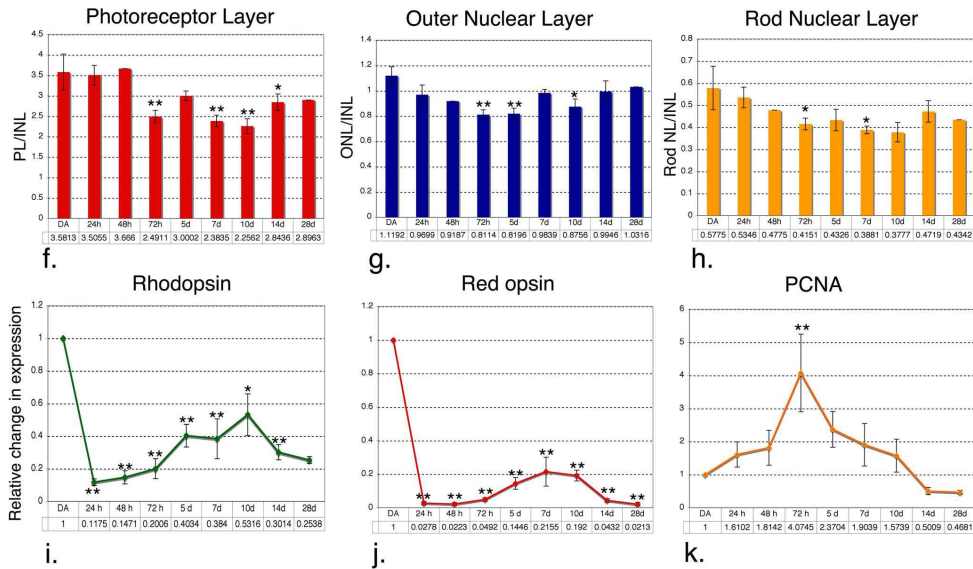
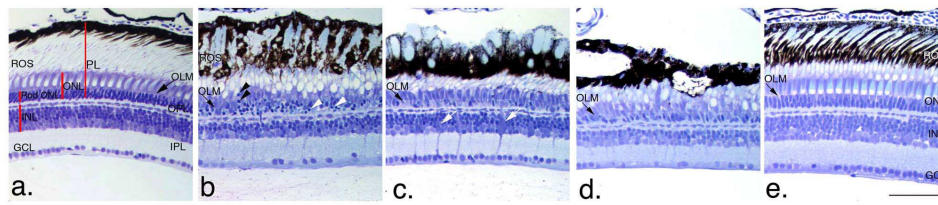
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Dr.4551.2.A1_at	LOC591437	--	hypothetical LOC591437	--	--	--	--	0.1471	-1.12
Dr.4577.1.A1_at	wu.1b93g02	--	wu.1b93g02	Transcribed sequences	--	--	--	0.7817	-1.12
Dr.15262.1.S1_at	slk381	zgc:55777	serine/threonine kinase 3 similar to serine/threonine protein amino acid phospho-	--	--	--	nucleotide binding // protein kinase activity // protein seri	0.5296	-1.12
Dr.25285.1.S1_at	zgc:73223	zgc:73223	hypothetical protein MGC7	--	--	--	--	0.0720	-1.12
Dr.11205.1.S1_at	lpl1a	--	triosephosphate isomerase/triosephosphate isomerase/metabolic process	glucogenesis // glyc	--	--	catalytic activity // triose- triose-phosphate isomerase activity /	0.2250	-1.03
Dr.15574.1.A1_at	hprt1l	--	hypoxanthine phosphoribosyltransferase	purine ribonucleoside sal	cytoplasm	--	hypoxanthine phosphorib-	0.4472	-1.13
Dr.24454.1.S1_at	lcm5	--	similar to putative tumor rRNA binding motif protein 1	--	--	--	--	0.4487	-1.13
Dr.25228.1.A1_at	tom1	--	target of myp1 (choiken)	Transcribed sequences	intracellular protein trans	--	--	0.7548	-1.13
Dr.19215.1.S1_at	zgc:136828	--	Transcribed sequence with	--	--	--	sulfotransferase activity /	0.4655	-1.13
Dr.5878.1.S1_at	atp1a3b	--	ATPase, Na+K+ transp	ATPase, Na+K+ transp	transp // cation transp	transp // potassium membrane attack complex	integrat to plasma memb	0.3558	-1.14
Dr.25318.1.A1_at	--	--	Transcribed sequences	--	--	--	--	0.3224	-1.14
Dr.16181.1.A1_at	zgc:77260	--	zgc:77260	CDNA clone MGC:77260	litranscription // transcrip	nucleus	DNA binding // transcrip	0.2414	-1.14
Dr.11236.1.A1_at	--	--	Transcribed locus	Transcribed sequences	--	--	--	0.8985	-1.14
Dr.11285.1.S1_at	ywhag1	--	3-monoxygenase/hydr	CDNA clone MGC:73131	litranscription // transcrip	cytoplasm	protein domain specific b	0.8212	-1.14
Dr.11082.1.A1_at	LOC:100006450 // zgc:92	--	zgc:92294	// hypothetical	Transcribed sequence with	--	guanyl-nucleotide exch	0.5295	-1.14
Dr.11441.1.A1_at	lcm5	--	tenascn R (restrictin, jan tenascn R (restrictin, janusignal transduction // ax	--	--	--	receptor binding	0.8600	-1.14
Dr.12783.1.S1_at	LOC:559207	--	hypothetical LOC:559207	Transcribed sequences	--	--	--	0.5445	-1.14
Dr.25552.2.S1_at	LOC:565483	--	hypothetical LOC:565483	CDNA clone MGC:55996	litranscription // transcrip	--	--	0.5777	-1.15
Dr.11441.1.A1_at	LOC:569678	--	hypothetical LOC:569678	Transcribed sequence with	--	--	--	0.4358	-1.15
Dr.274.1.S1_at	pknox1	zgc:55328	6-phosphofructo-2-kinase/wu.511110	fructose 2,6-bisphosphat	fructose 2,6-bisphosphat	nucleus	catalytic activity // ATP b	0.5940	-1.15
Dr.16560.1.A1_at	epas1	--	endothelial PAS domain	Transcribed sequence with	transcription // transcrip	--	DNA binding // signal tra	0.6371	-1.15
Dr.25060.1.S1_at	zgc:55492	zgc:55492	zgc:55492	wu.5191c10	protein folding	protein folding	heat shock protein bindin	0.6290	-1.15
Dr.3681.1.S1_at	LOC:798505 // nkr	--	natural killer-tumor recog	Transcribed sequence with	protein folding	--	peptidyl-prolyl cis-trans is	0.4064	-1.16
Dr.8425.1.A1_at	ak5	--	adenylylate kinase 5	Transcribed sequences	--	--	--	0.1880	-1.16
Dr.8000.1.S1_at	gpx1b	--	glutathione peroxidase 11	Transcribed sequence with	response to oxidative str	--	peroxidase activity // glu	0.3556	-1.16
Dr.11473.1.A1_at	zgc:92578	--	zgc:92578	Transcribed sequence with	--	mitochondrion	nucleotide binding // AT	0.5448	-1.16
Dr.12931.1.A1_at	--	--	Transcribed locus	Transcribed sequences	--	--	--	0.1216	-1.16
Dr.2506.1.S1_at	--	--	Transcribed locus	Transcribed sequence with	--	--	--	0.2236	-1.17

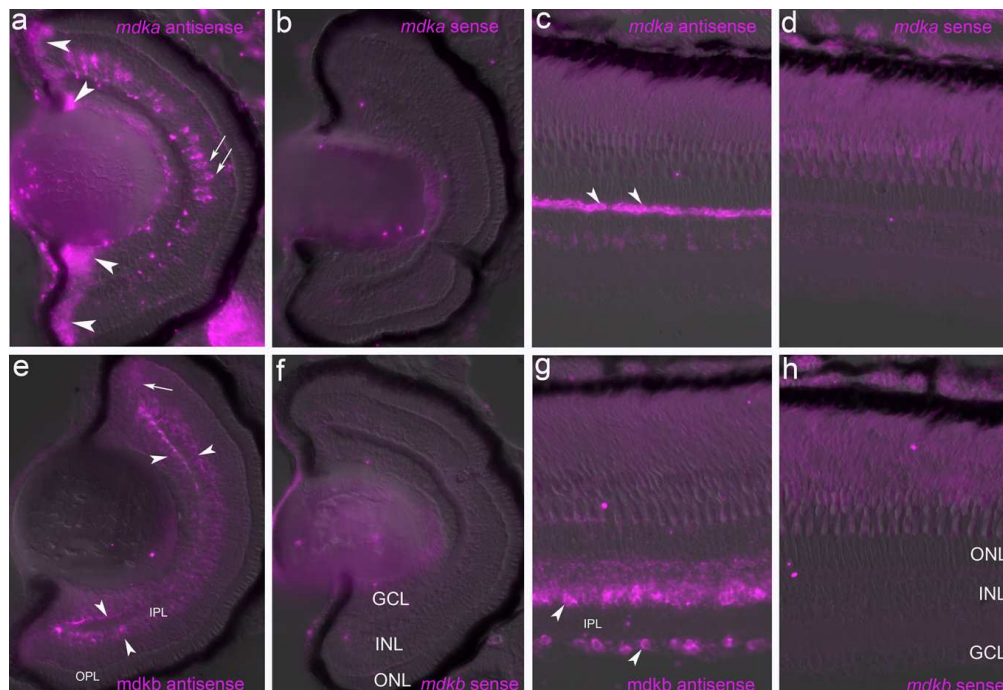
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Dr.9851.1.A1_at	--	--	Transcribed locus	Transcribed sequences	--	--	--	--	0.0005	-2.74
Dr.4119.1.S1_at	gucab1	gucab1	guanylate cyclase activator	guanine nucleotide binding	calcium ion transport	--	--	calcium channel activity / calcium ion binding	0.0001	-2.76
Dr.20008.3.A1_at	grb1	grb1	guanine nucleotide binding	signal transduction	--	--	--	signal transducer activity	0.0107	-3.00
Dr.12896.1.S1_at	is2b	zgc:73382	inhibitor of DNA binding	zinc finger	regulation of transcription	carbohydrate metabolism	nucleus	DNA binding // transcript DNA binding // hydrolase activity, hyd	0.0000	-3.00
Dr.12896.2.A1_at	is2b	zgc:73382	inhibitor of DNA binding	zinc finger	regulation of transcription	carbohydrate metabolism	nucleus	DNA binding // transcript DNA binding // hydrolase activity, hyd	0.0000	-3.10
Dr.9853.1.A1_at	pde6a	--	phosphodiesterase 6A, c	Transcribed sequence	with signal transduction	--	--	catalytic activity // 3',5'-cyclic	0.0013	-3.24
Dr.11183.1.A1_at	--	--	Transcribed sequences	--	--	--	--	--	0.0001	-3.26
Dr.9912.1.A1_at	wu:fk57g06	--	Transcribed sequences	--	--	--	--	--	0.0000	-4.08

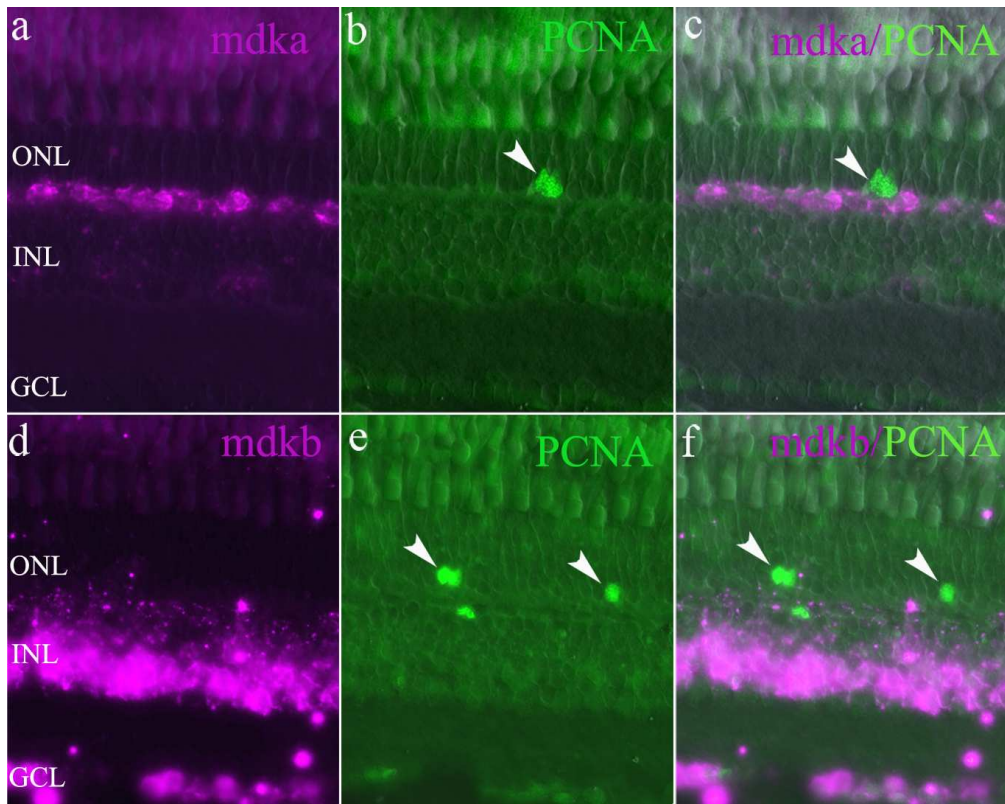
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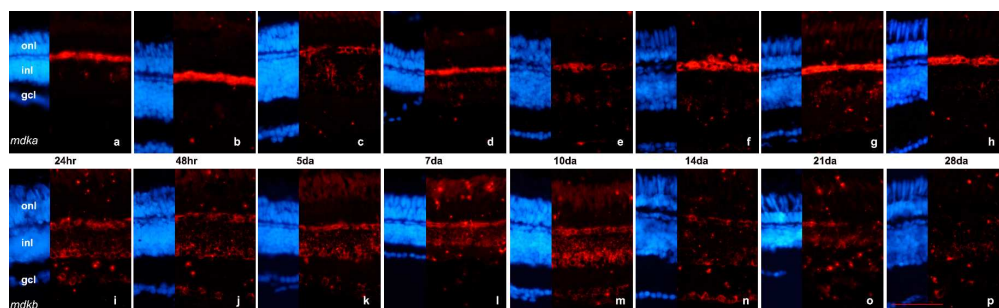


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view



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