



Fig. S1. Alignment: Sequence alignment of mouse, human, mammalian-like chicken (Chick M), and xenopus-like chicken (Chick X) melanopsins. An alignment of four melanopsin gene sequences (Uniprot, Appendix A) was created using T-Coffee and BOXSHADE (Notredame et al., 2000; Di Tommaso et al., 2011) Extracellular, intracellular, and transmembrane regions are denoted by overhead bars. The conserved lysine at mouse residue 291 is highlighted. High conservation is seen in the transmembrane regions, while less conservation is observed in both the amino (extracellular) and carboxy (intracellular) termini. Lower conservation in the third cytoplasmic (intracellular) loop as well suggests possible variations in G-protein specificity.

Table S1. Uniprot Identifiers

Sequences for phylogenetic analysis and sequence alignment were retrieved from Uniprot. Accession numbers Q2KNE6 (*Gallus gallus*, Opn4m), A9QM68 (*Gallus gallus*, Opn4x), Q9QXZ9 (*Mus musculus*, Opn4), Q9UHM6 (*Homo sapiens*, Opn4), O57422 (*Xenopus laevis* Opn4b), Q2KNE5 (*Danio rerio*, Opn4a), F1QZ18 (*Danio rerio*, Opn4xa), E7FEB1 (*Danio rerio*, Opn4b), G8Z410 (*Danio rerio*, Opn4.1), G8Z413 (*Danio rerio*, Opn4xb), Q8R456 (*Rattus norvegicus*, Opn4), Q6XL69 (*Rutilus rutilus*, Opn4), Q4U4D2 (*Podarcis siculus*, Opn4), and Q4R1I4 (*Branchiostoma belcheri*, Opn4) were used.

Accession Number	Accession Name	Organism
Q2KNE6	Q2KNE6_CHICK (Opn4m)	<i>Gallus gallus</i> (Chicken)
A9QM68	A9QM68_CHICK (Opn4-1) (x)	<i>Gallus gallus</i> (Chicken)
Q9QXZ9	OPN4_MOUSE	<i>Mus musculus</i> (Mouse)
Q9UHM6	OPN4_HUMAN	<i>Homo sapiens</i> (Human)
O57422	OPN4B_XENLA	<i>Xenopus laevis</i> (African clawed frog)
Q2KNE5	OPN4A_DANRE (Opn4a)	<i>Danio rerio</i> (Zebrafish) (Brachydanio rerio)
F1QZ18	F1QZ18_DANRE (Opn4xa)	<i>Danio rerio</i> (Zebrafish) (Brachydanio rerio)
E7FEB1	E7FEB1_DANRE (Opn4b)	<i>Danio rerio</i> (Zebrafish) (Brachydanio rerio)
G8Z410	G8Z410_DANRE (Opn4.1)	<i>Danio rerio</i> (Zebrafish) (Brachydanio rerio)
G8Z413	G8Z413_DANRE (Opn4xb)	<i>Danio rerio</i> (Zebrafish) (Brachydanio rerio)
Q8R456	OPN4_RAT	<i>Rattus norvegicus</i> (Rat)
Q6XL69	OPN4_RUTRU	<i>Rutilus rutilus</i> (Roach)
Q4U4D2	OPN4_PODSI	<i>Podarcis siculus</i> (Italian wall lizard)
Q4R1I4	OPN4_BRABE	<i>Branchiostoma belcheri</i> (Amphioxus)

References

- Di Tommaso, P., Moretti, S., Xenarios, I., Orobittg, M., Montanyola, A., Chang, J. M., Taly, J. F. and Notredame, C. (2011). T-Coffee: a web server for the multiple sequence alignment of protein and RNA sequences using structural information and homology extension. *Nucleic Acids Res.* **39**, W13-W17. doi:10.1093/nar/gkr245
- Notredame, C., Higgins, D. G. and Heringa, J. (2000). T-Coffee: a novel method for fast and accurate multiple sequence alignment. *J. Mol. Biol.* **302**, 205-217. doi:10.1006/jmbi.2000.4042