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Correction: Melanopsin- and L-cone-induced pupil constriction is inhibited by S- and M-cones in humans (vol 115, pg 792, 2018)

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Correction

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Correction for "Melanopsin- and L-cone–induced pupil constriction is inhibited by S- and M-cones in humans," by Tom Woelders, Thomas Leenheers, Marijke C. M. Gordijn, Roelof A. Hut, Domien G. M. Beersma, and Emma J. Wams, which was first published January 8, 2018; 10.1073/pnas.1716281115 (*Proc Natl Acad Sci USA* 115:792–797).

The authors note that, due to a printer's error, three references were omitted from the references list in the article. Additionally, the original ref. 28 is identical to ref. 5. Therefore, original ref. 28 is removed and three references are added at the end of the complete references, which appear below.

1. Lee BB (2011) Visual pathways and psychophysical channels in the primate. *J Physiol* 589:41–47.
2. Güler AD, et al. (2008) Melanopsin cells are the principal conduits for rod-cone input to non-image-forming vision. *Nature* 453:102–105.
3. Berson DM, Dunn FA, Takao M (2002) Phototransduction by retinal ganglion cells that set the circadian clock. *Science* 295:1070–1073.
4. Dacey DM, et al. (2005) Melanopsin-expressing ganglion cells in primate retina signal colour and irradiance and project to the LGN. *Nature* 433:749–754.
5. Spitschan M, Jain S, Brainard DH, Aguirre GK (2014) Opponent melanopsin and S-cone signals in the human pupillary light response. *Proc Natl Acad Sci USA* 111:15568–15572.
6. Estévez O, Spekreijse H (1982) The "silent substitution" method in visual research. *Vision Res* 22:681–691.
7. Parry NRA, McKeefry DJ, Kremers J, Murray IJ (2016) A dim view of M-cone onsets. *J Opt Soc Am A Opt Image Sci Vis* 33:A207–A213.
8. McKeefry D, et al. (2014) Incremental and decremental L- and M-cone-driven ERG responses: I. Square-wave pulse stimulation. *J Opt Soc Am A Opt Image Sci Vis* 31:A159–A169.
9. Kremers J, et al. (2014) Incremental and decremental L- and M-cone driven ERG responses: II. Sawtooth stimulation. *J Opt Soc Am A Opt Image Sci Vis* 31:A170–A178.
10. Barboni MTS, et al. (2017) L-/M-cone opponency in visual evoked potentials of human cortex. *J Vis* 17:20.
11. Bartley SH (1939) Some effects of intermittent photic stimulation. *J Exp Psychol* 25:462–480.
12. Gooley JJ, et al. (2012) Melanopsin and rod-cone photoreceptors play different roles in mediating pupillary light responses during exposure to continuous light in humans. *J Neurosci* 32:14242–14253.
13. Vartanian GV, Zhao X, Wong KY (2015) Using flickering light to enhance nonimage-forming visual stimulation in humans. *Invest Ophthalmol Vis Sci* 56:4680–4688.
14. Lee J, Stromeyer CF, 3rd (1989) Contribution of human short-wave cones to luminance and motion detection. *J Physiol* 413:563–593.
15. Stockman A, MacLeod DI, DePriest DD (1991) The temporal properties of the human short-wave photoreceptors and their associated pathways. *Vision Res* 31:189–208.
16. Brown TM, et al. (2012) Melanopsin-based brightness discrimination in mice and humans. *Curr Biol* 22:1134–1141.
17. Hofer H, Carroll J, Neitz J, Neitz M, Williams DR (2005) Organization of the human trichromatic conemosaic. *J Neurosci* 25:9669–9679.
18. Do MTH, Yau K-W (2010) Intrinsically photosensitive retinal ganglion cells. *Physiol Rev* 90:1547–1581.
19. Cao D, Nicandro N, Barrionuevo PA (2015) A five-primary photostimulator suitable for studying intrinsically photosensitive retinal ganglion cell functions in humans. *J Vis* 15:15.1.27.
20. Hansen T, Pracejus L, Gegenfurtner KR (2009) Color perception in the intermediate periphery of the visual field. *J Vis* 9:26.1-12.
21. Altimus CM, et al. (2010) Rod photoreceptors drive circadian photoentrainment across a wide range of light intensities. *Nat Neurosci* 13:1107–1112.
22. Barrionuevo PA, Cao D (2016) Luminance and chromatic signals interact differently with melanopsin activation to control the pupil light response. *J Vis* 16:29.
23. Adelson EH (1982) Saturation and adaptation in the rod system. *Vision Res* 22:1299–1312.
24. Lucas RJ, et al. (2014) Measuring and using light in the melanopsin age. *Trends Neurosci* 37:1–9.
25. Switkes E, Crognale MA (1999) Comparison of color and luminance contrast: Apples versus oranges? *Vision Res* 39:1823–1831.
26. Cleveland WS, Grosse E, Shyu WM (1992) Local regression models. *Statistical Models in S*, eds Chambers JM, Hastie TJ (Chapman and Hall, London), pp 309–376.
27. Bates D, Mächler M, Bolker B, Walker S (2015) Fitting linear mixed-effects models using lme4. *J Stat Softw* 67:1–48.
28. Stockman A, Sharpe LT (2000) The spectral sensitivities of the middle- and long-wavelength-sensitive cones derived from measurements in observers of known genotype. *Vision Res* 40:1711–1737.
29. Beatty S, Koh HH, Carden D, Murray IJ (2000) Macular pigment optical density measurement: a novel compact instrument. *Ophthalmic Physiol Opt* 20:105–111.
30. Bone RA, Landrum JT, Cains A (1992) Optical density spectra of the macular pigment in vivo and in vitro. *Vision Res* 32:105–110.

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