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THE SPATIAL ARRANGEMENT OF L AND M CONES IN THE LIVING HUMAN EYE ((P. D. Gowdy¹, S. Otake², and C. M. Cicerone¹)) University of California, Irvine, CA¹; Matsushita Electric Industrial Co., Ltd., Kyoto, Japan².

Purpose. To determine the spatial arrangement of cones in the living human eye. **Methods.** Two color normal observers, using a percent scale for redness and greenness, judged colors seen when tiny tests of unvarying wavelength and intensity illuminated different locations (1.5 min of arc spacing) of retina centered at 17 deg temporal eccentricity. Here cone spacing, the eye's optics, and fixational accuracy make it likely that only 1-3 cones contribute to detection of the test flash (0.86 min of arc, 50 msec, 555 nm, 80% seen, self-presented in Maxwellian view). A rod bleach and a dim, steady background (460 nm) selectively reduced rod and S cone sensitivity but did not affect red-green judgements. Spectral sensitivity in locations judged 100% red were consistent with L cones; 100% green with M cones. An ideal observer analysis based on red-green color opponency determined the cone mosaic most likely to account for variations in color appearance with retinal location. **Results.** For this patch of retina, Observer A's mosaic has an estimated 48 L and 23 M cones; Observer B has 46 L and 23 M cones. Locations not specified as L or M are possible S cone locations, one for Observers A and three for Observer B. Statistical analyses of these mosaics indicate that the spatial arrangements of L and M cones are indistinguishable from random arrays. **Conclusions.** The cone mosaic in the tested region of the color normal living human eye is populated by twice as many L cones as compared to M cones, randomly distributed in the photoreceptor matrix.

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None