

Supplemental Items

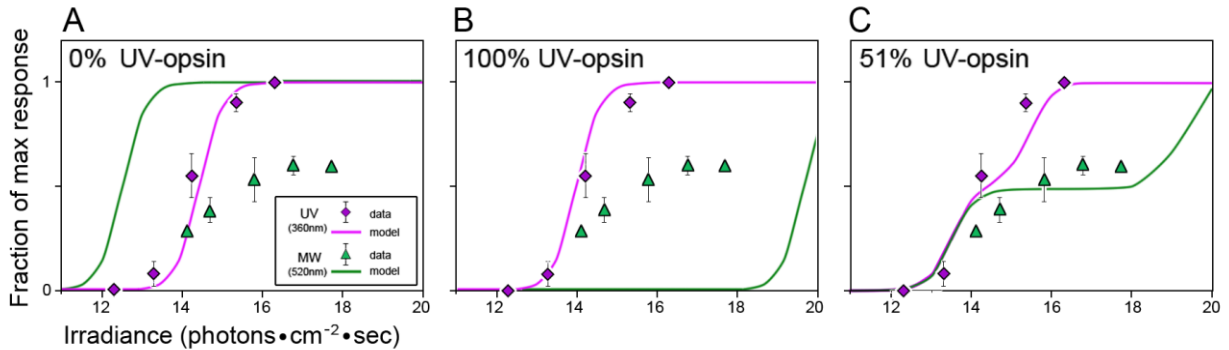


Figure S1. Related to Figure 3B and Figure 4. Modeling implies mixed UV and MW cone opsin input to M5 center response. Points plot the normalized response (mean and SEM, $n = 6$) of recorded M5 cells to a stimulus in the receptive-field center as illustrated in Figure 3C as a function of intensity and wavelength (green triangles: 520 nm; purple diamonds: 360 nm). Curves plot the response for a modeled cell receiving a weighted linear sum of drive from the two cone opsins, one peaking in the ultraviolet (UV, 360 nm) and the other middle wavelengths (MW, 510 nm). Three weightings of the two pigments are shown, as noted at top left. The closest fit to the observed spectral behavior is obtained with an almost equal balance of the two pigment influences (49% MW, 51% UV; panel C).

Table S1. Related to Figure 4 and Figure 5. Contact area analysis of connectivity between presumptive M5 cells and bipolar cells extracted from data of Helmstaedter et al, 2013.

	Presumptive M5 Cell #33	Presumptive M5 Cell #35	Presumptive M5 Cell #36
Type 5 CB (5A, 5R, 5X) +XBC	0/75; max 0.00	0/75; max 0.30	0/75; max 0.06
Type 6 CB	9/45; max 1.95	9/45; max 1.67	30/45; max 5.71
Type 7 CB	4/29; max 1.66	4/29; max 1.66	5/29; max 2.95
Type 8 CB	1/6; max 1.06	0/6; max 0.67	4/6; max 14.00
Type 9 CB – UV	3/7; max 2.12	4/7; max 3.23	5/7; max 14.38
Rod bipolar	0/144; max 0.79	0/144; max 0.97	6/144; max 6.99

Cells labeled as #33, #35 and #36 in Helmstaedter et al., 2013 are presumptive M5 cells based on morphology. The fraction listed before the semicolon in each column represents the fraction of bipolar cells (grouped by subtypes) that meet the minimum threshold criteria to assume synaptic contact onto a presumptive M5 cell, as a fraction of the total number of bipolar cells of that type in the volume. Threshold contact area $>1 \mu\text{m}^2$ has a $>95\%$ probability of being an actual synapse as in Helmstaedter et al., 2013. The value after the semicolon represents maximum contact area in μm^2 .

Movie File S1. Related to Figure 5 and Figure 6. Illustration of Type 9 bipolar cell making synaptic contact onto a presumptive M5 cell.

Cell processes are reconstructed from Helmstaedter et al., 2013 and illustrated in Figures 4 and 5. Shown is a presumptive M5 cell dendrite in blue (#2027) receiving synaptic input from a Type 9 bipolar cell in green (#4a). The bipolar cell synaptic ribbon is shown in red.