

Expanded View Figures

Figure EV1. Bipolar marker gene expression in the compiled human neural retina transcriptome atlas (20,009 cells).

- A Feature expression heatmap of VSX2 (pan-bipolar), ISL1 (ON-bipolar), GRIK1 (OFF-bipolar), PRKCA (rod bipolar cells), and TTR (DB4 bipolar).
- B t-SNE plots showing gene expression for 14 new markers for individual bipolar subtypes identified in a previous mouse scRNA-seq study (Shekhar *et al*, 2016).

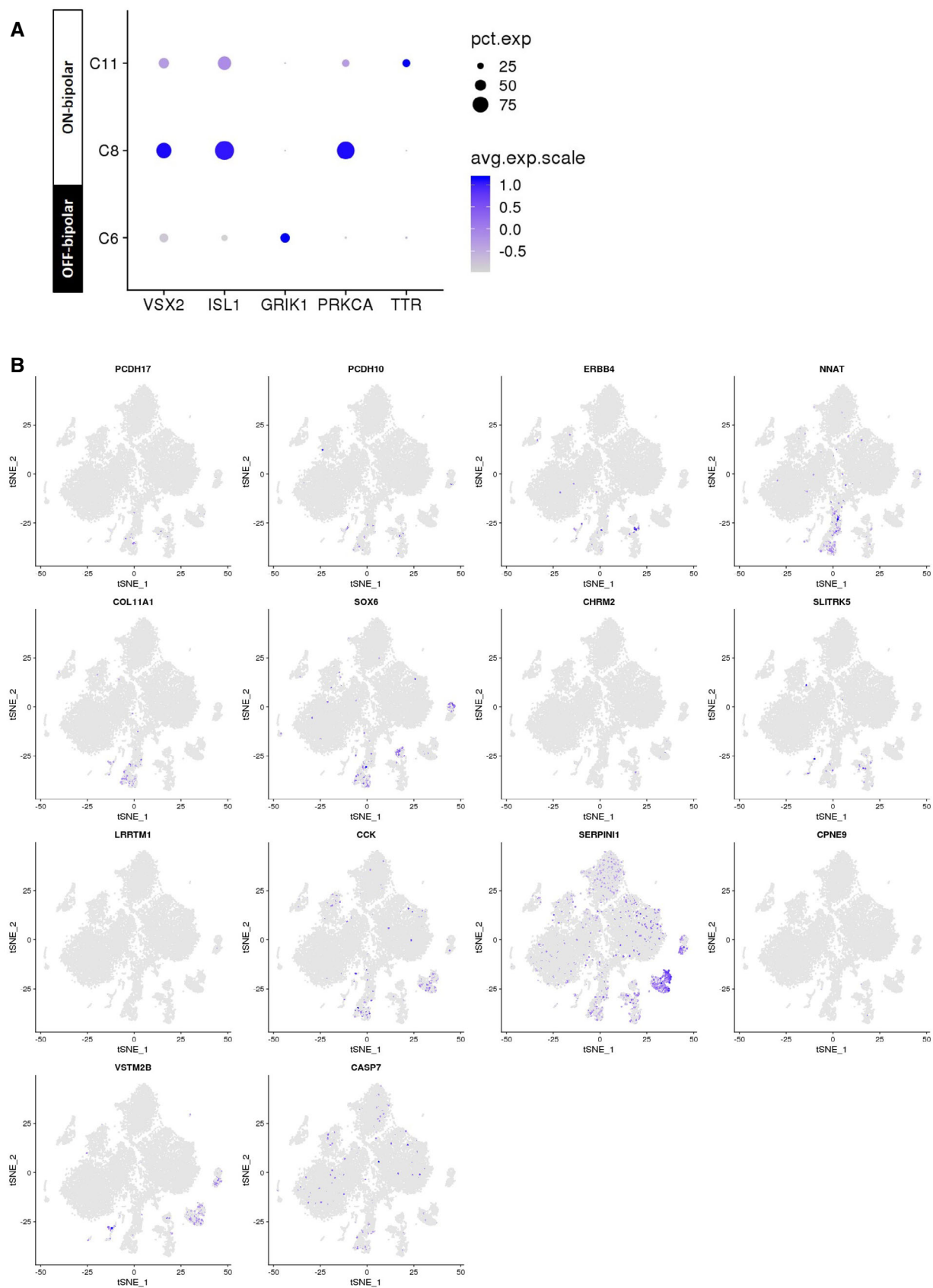


Figure EV1.

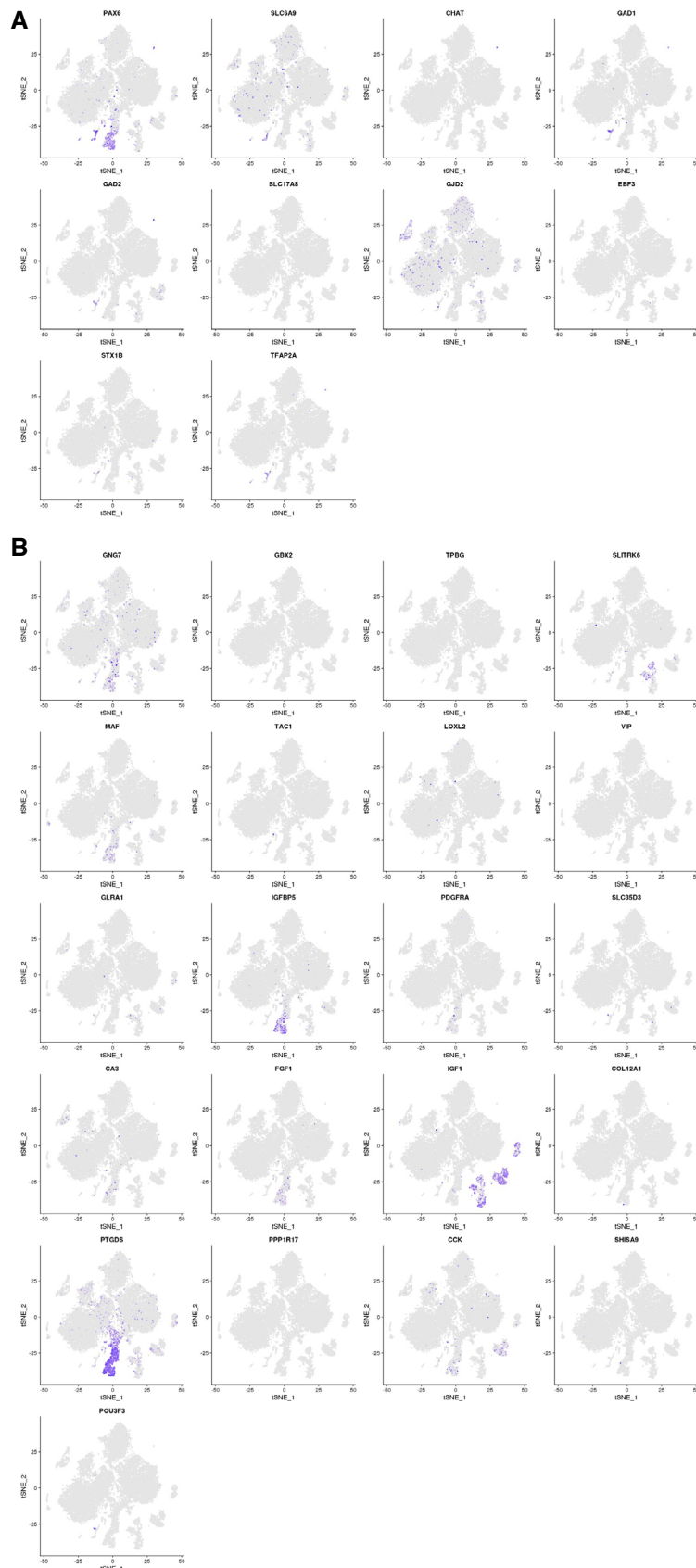


Figure EV2. Amacrine marker gene expression in the compiled human neural retina transcriptome atlas (20,009 cells).

A, B t-SNE plots showing gene expression in the compiled human retina transcriptome atlas (20,009 cells). (A) 10 commonly used amacrine markers and (B) new markers for amacrine subtypes identified in a previous mouse scRNA-seq study (Macosko et al, 2015).

Figure EV3. MALAT1 expression in human retina.

- A Fluorescent *in situ* hybridization showing expression of *MALAT1* in three donor retina samples (Retina 4–6). Retina 5 from Fig 2E is also displayed here for easier comparison. Green arrows highlight rod photoreceptors with low levels of *MALAT1* in Retina 4 and Retina 6, and white arrows highlight rod photoreceptors with high levels of *MALAT1* in Retina 5. Scale bars = 20 μm .
- B Correlation of proportion of MALAT1-hi rod populations with time of retina retrieval after death for Retina 1–3.

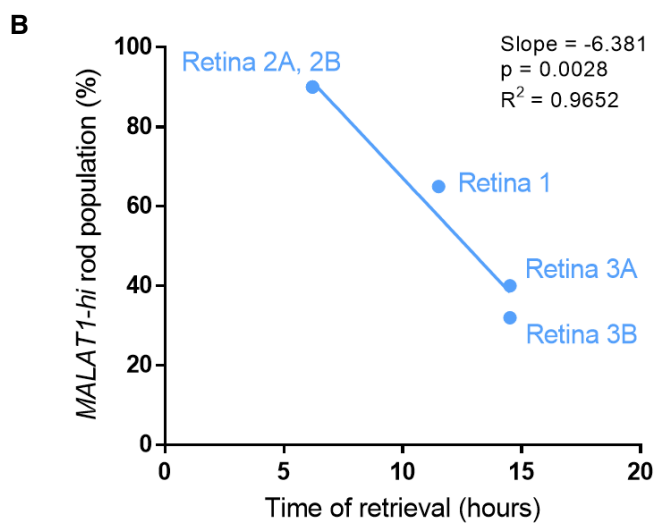
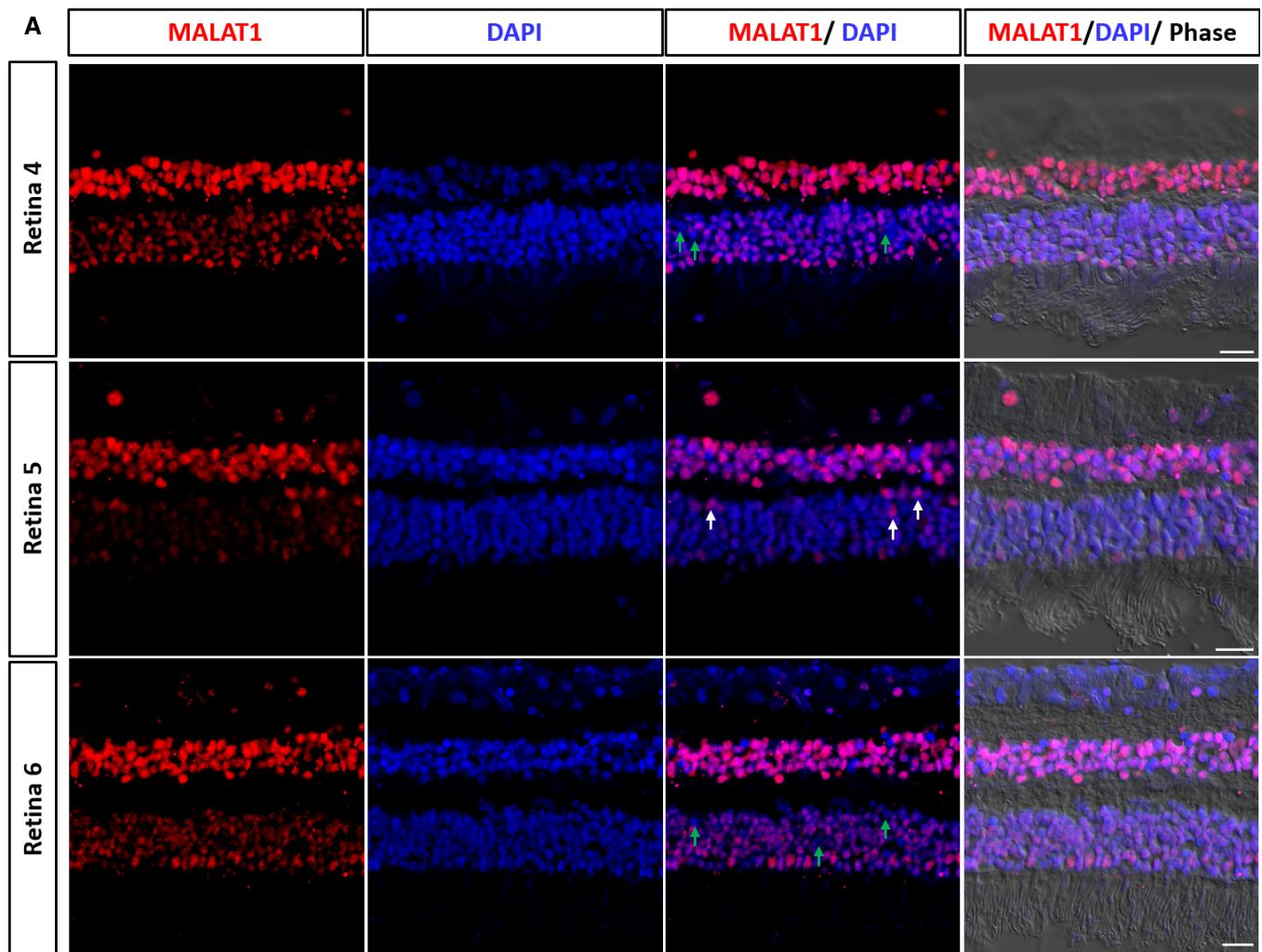
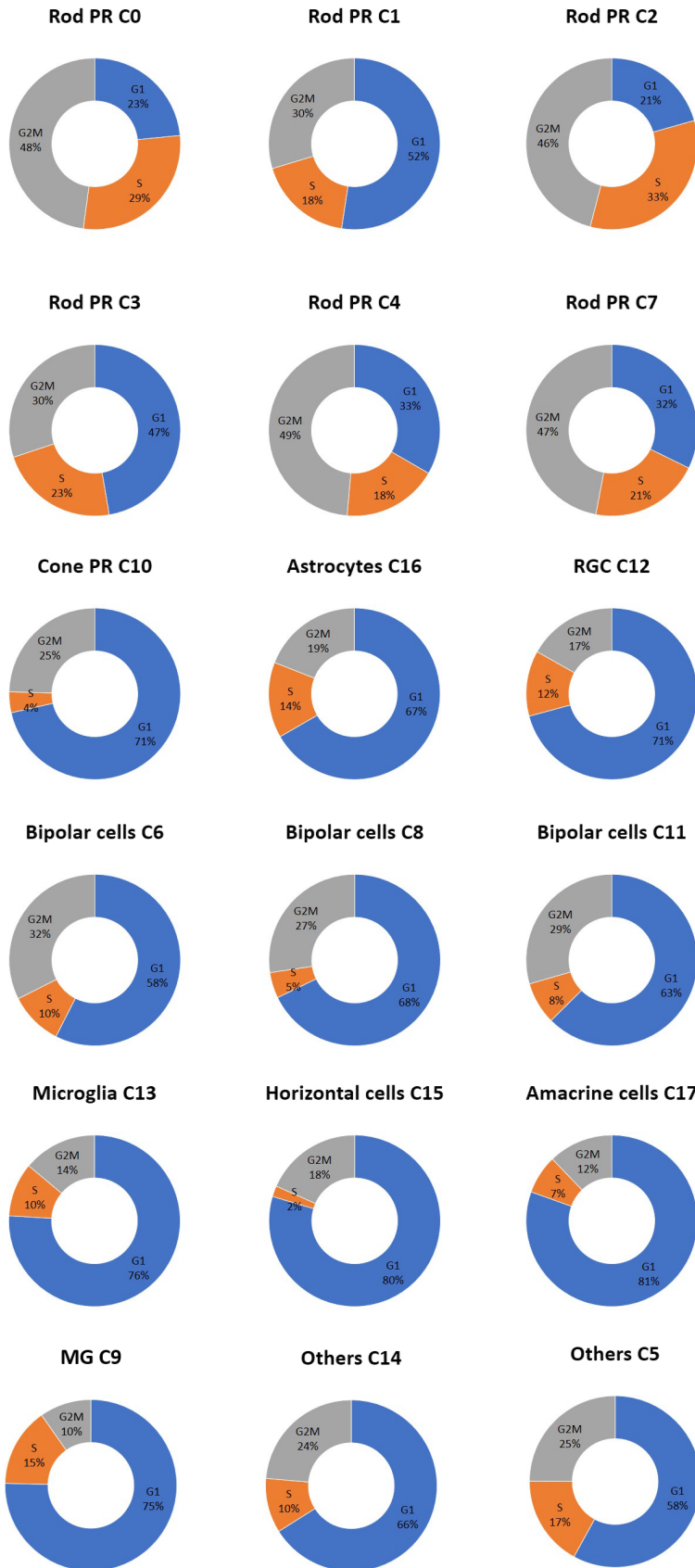


Figure EV3.

Figure EV4. Cell cycle scores for major retinal cell types.
 Cell cycle scores across major retinal cell clusters showing the likelihood for the proportion of cells in G1, S, or G2/M phases.



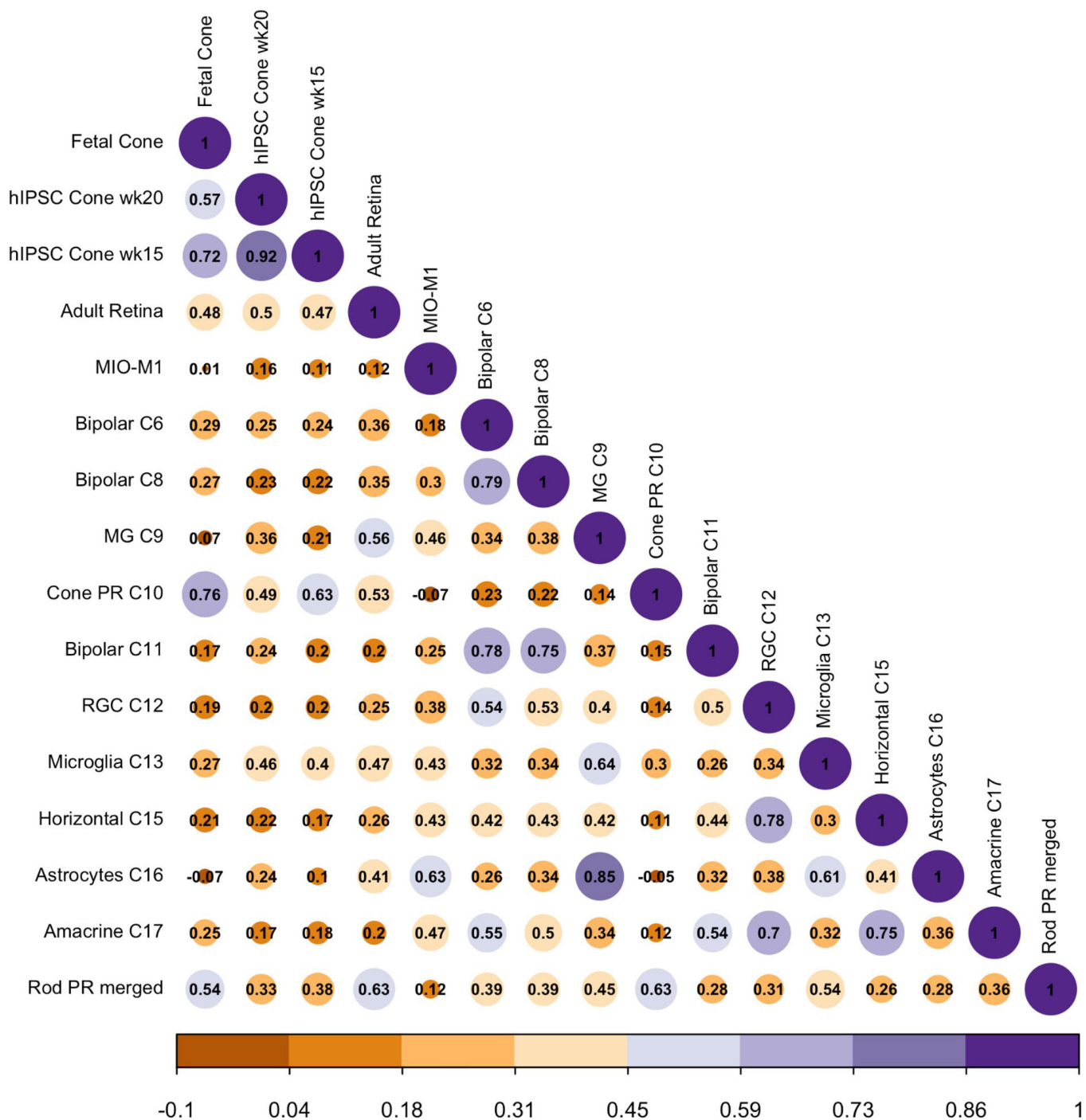


Figure EV5. Using the human neural retina transcriptome atlas as a benchmark.

Correlation matrix to benchmark hiPSC-derived cone photoreceptors (week 15 and week 20; Welby *et al*, 2017), fetal cone photoreceptors (Welby *et al*, 2017), adult retina (Phillips *et al*, 2018), and the human Müller glia cell line MIO-M1 against all retinal cell types identified in this human neural retina atlas.