Supplemental Information

SARS-CoV-2 infects and replicates in photoreceptor and retinal ganglion cells of human retinal organoids

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Figure S1: Supplementary information for figure 1

A retinal organoid derived from H9 embryonic stem cells stained with an anti–SARS-CoV-2 nucleocapsid (N) antibody (green). Scale bar = 50 µM. (A). PCA analysis of the different infected on noninfected samples was performed using the rlog algorithm.
**Figure S2: Supplementary information for figures 2 and 3**

Retinal organoids infected with SARS-CoV-2 on day 90 (B) or day 130 (C) were stained with antibodies against SARS-CoV-2 nucleocapsid (N, green) and the retinal ganglion marker SNCG (white) (B), the photoreceptor and bipolar marker OTX2 (white) (C), the amacrine and horizontal marker AP2α (red) (C). The percentage of cells co-stained with OTX2 or AP2A at day 130 was compared (D) AP2A+ cells appeared only in a few of the organoids. N = 8 organoids taken from two different wells**: P-value = 0.0044. Error bars represent standard deviation.

*Scale Bar: B, C, D = 10μm,*
Figure S3: Supplementary information for figure 4

(A) MA plot representing the mean expression levels and the fold change of the different genes between the infected samples and the noninfected samples. Significantly differentially expressed genes (adjusted P-value ≤ 0.05) are colored red (B). Venn diagram comparing the differentially expressed genes found in retinal organoids 96 hours post-infection and the differentially expressed genes found in choroid plexus organoids after 72 hours. Only 7 genes are mutually upregulated and 4 genes are mutually downregulated (C).
| Antibody                          | Source         | Cat. num   | Dilution |
|----------------------------------|----------------|------------|----------|
| ACE 2                            | Abcam          | ab1348     | 1:500    |
| AP2A                             | Abcam          | ab220065   | 1:200    |
| CHX10 (VSX2)                     | Milipore       | ab9014     | 1:500    |
| CRALBP                           | Abcam          | Ab15051    | 1:500    |
| HUC/D                            | Invitrogen     | A21271     | 1:100    |
| Rabbit IgG polyclonal isotype control | Abcam          | Ab37415     | 1:500    |
| IL33                             | Abcam          | Ab118503   | 1:200    |
| L/M Opsin                        | Milipore       | AB5405     | 1:500    |
| OTX2                             | R&D systems    | AF1979     | 1:500    |
| PAX6                             | Biolegend      | 901301     | 1:500    |
| RHODOPSIN                        | Millipore      | MAB5316    | 1:500    |
| SARS-CoV/SARS-CoV-2 nucleocapsid | Sino biological | 40143-MM05 | 1:200    |
| SNCG                             | Abcam          | Ab55424    | 1:500    |

**Table S1** – primary antibodies used for the study
| Target     | Forward                              | Reverse                                  |
|------------|--------------------------------------|------------------------------------------|
| GAPDH      | TGATGACATCAAGAAGGTGGT               | ACCCTGTGGCTGTAGCCAAT                      |
| SARS-CoV-2 | CGCATACAGTCTTRCAGGCT                 | GTGATGTGAWATGACAT                         |

**Table S2** – Primers used for the study