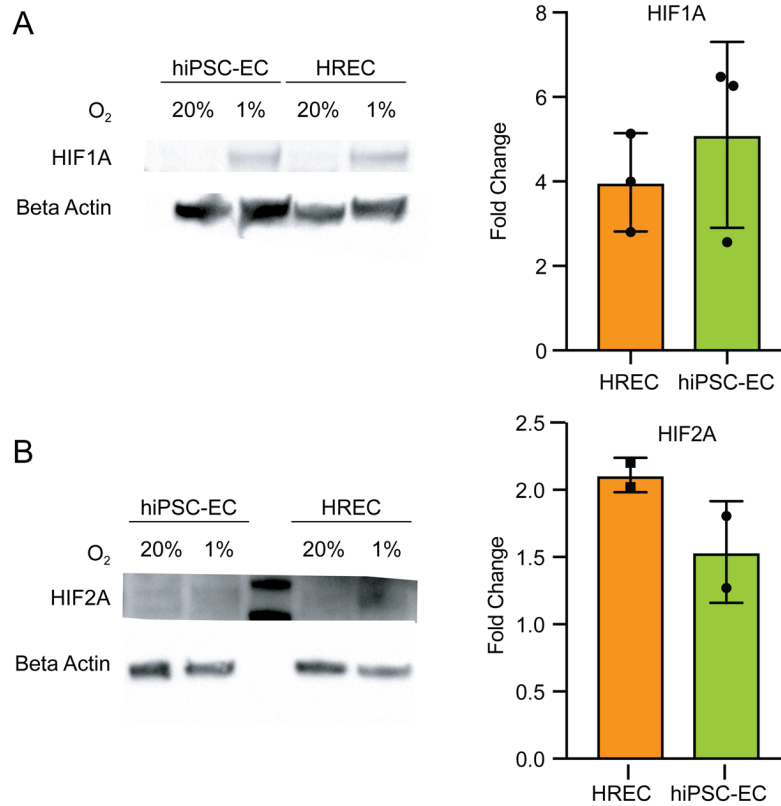


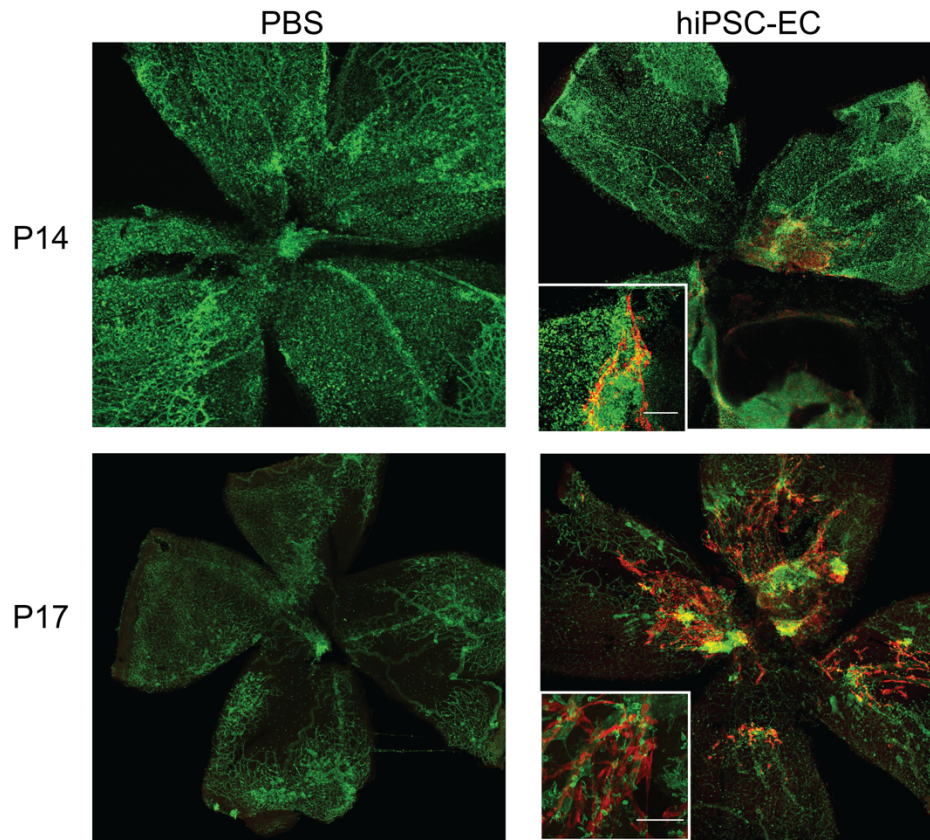
Supplemental Figure 1



Supplementary Figure 1: Hypoxia inducible factor (HIF)1A and HIF2A expression. (A)

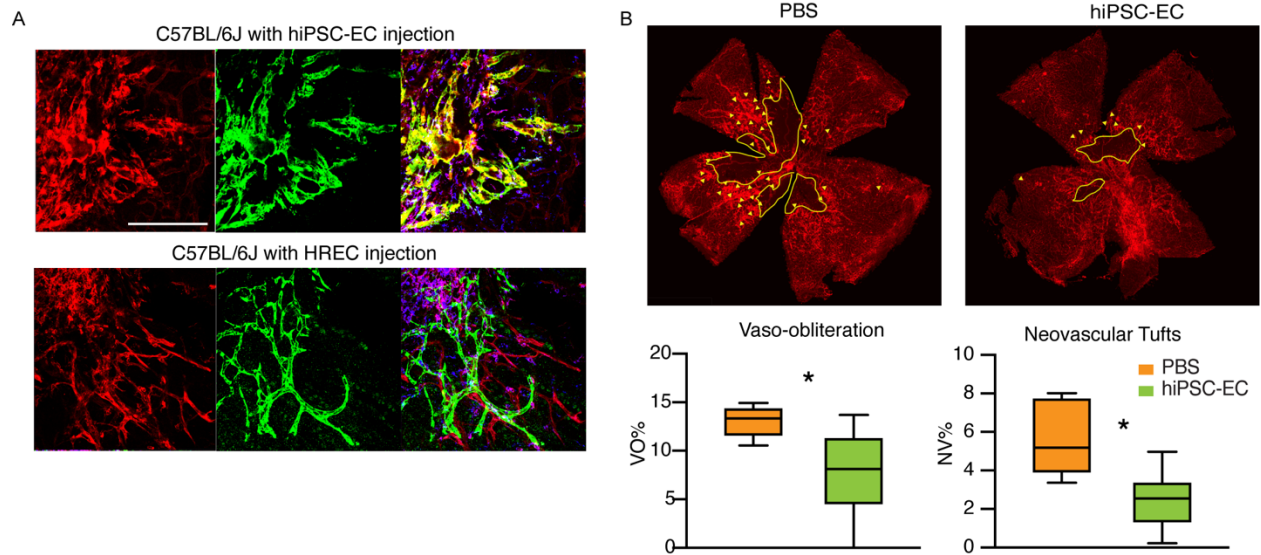
Western blot and corresponding quantification show similar accumulation of HIF1A (N = 3) and (B) HIF2A (N = 2) under hypoxic conditions in both hiPSC-ECs and human retinal endothelial cells (HRECs) after exposure to hypoxia. Data is presented as mean ± SD.

Supplemental Figure 2



Supplementary Figure 2: hiPSC-EC (red) co-localization with host vasculature (lectin, green) at an early time point. The hiPSC-ECs injected at P12 show co-localization with host vasculature as early as P14 (top) with continued co-localization at P17 (bottom).

Supplemental Figure 3



Supplementary Figure 3: hiPSC-ECs injected in immunocompetent C57BL/6J mice.

Similar to immunodeficient mice (NOD/SCID), **(A)** hiPSC-ECs (green) injected into immunocompetent C57BL/6J mice show similar patterns of co-localization with host vasculatures (top, lectin, red) whereas HREC injected eyes show limited co-localization (bottom). **(B)** Significant reduction in vascular obliteration (VO) and pathological retinal neovascularization (NV) by hiPSC-ECs in oxygen induced retinopathy (OIR) model without any signs of host-rejection (N=6). Box represents 25th to 75th percentile, line at median value, whiskers represent min and max value. Significance level are set at * $p \leq 0.05$ by 2-tailed student's t-test. Scale bar = 200 μm .

Supplemental Table 1

Antibodies used in this study

Antibody	Source	Catalog #	Purpose	Host Species and Reactivity	Concentration
AlexaFluor 488	ThermoFisher Scientific	A11008	IF	Goat anti-rabbit	1:1000
AlexaFlour 546	ThermoFisher Scientific	A1030	IF	Goat anti-mouse	1:1000
Beta Actin	Abcam	ab8226	WB	Mouse anti-human	1:2000
CD31	Abcam	ab32457	IF	rabbit anti-human	1:200
CD31-PE	BD	555446	MACS	Mouse anti-human	1:20
CXCR4-PE	BioLegend	146505	FC	Mouse anti-human	1:20
DAPI	Roche	10236276	IF	Nuclei	1:1000
IgG-PE	BD	555749	FC	Mouse anti-human	1:20

AlexaFlour 546- Phalloidin	ThermoFisher Scientific	A22283	IF	F-actin	1:1000
AlexaFlour 488- Phalloidin	ThermoFisher Scientific	A12379	IF	F-actin	1:1000
AlexaFluor 635- Phalloidin	ThermoFisher Scientific	A34054	IF	F-actin	1:1000
HRP-linked, anti- rabbit IgG	Cell Signaling Technology	7074	WB	Goat anti- rabbit	1:2000
HRP-linked, anti-mouse IgG	Cell Signaling Technology	7076	WB	Horse anti- mouse	1:2000
<u>CXCR4</u>	<u>R&D Systems</u>	<u>MAB170</u>	<u>Intravitreal injection</u>	<u>Mouse anti- human</u>	<u>0.25-0.5ug</u>
VEcad	Santa Cruz	sc-9989	IF	Mouse anti- human	1:200