**FIGURE S1.** AAV2-CMV-EGFP expressions in the retina from 2 to 8 weeks after intravitreal (left panels) and subretinal (right panels) injections. GCL: ganglion cell layer; INL: inner nuclear layer; ONL: outer nuclear layer; RPE: retinal pigment epithelium. NC: normal control, 2W: 2 weeks after intraocular injection. Arrows indicated the EGFP expression cells. n=4/time point/group; Scale bar, 50 μm.
**FIGURE S2.** AAV2-CMV-EGFP expression in RPE cells was examined in RBCC flatmount at the following time points: 2, 4, 6 and 8 weeks after injection. NC: normal control, 2W: 2 weeks after intraocular injection. Robust EGFP expression was only observed in subretinal injected eyes. n=4/time point/group; Scale bar, 50 μm.
FIGURE S3. The CFU-E colony formation Assay. Three days after culture, colony numbers were counted using a light microscope under 200x. A. The mean number of CFU-E per 200x visual field, and the result was presented as 4 independent experiments. Each datum was expressed as mean ± SE. ** means P<0.01 when compared with the normal control group. B. Representative images of CFU-E in different groups. NC: normal control; PC: positive control; A-NC: aqueous humor from normal SD rats without treatment; A-AE: aqueous humor from SD rats with subretinal injection of AAV2-CMV-hEPO; S-NC: supernatant from normal R28 cells without treatment; S-AE: supernatant from R28 cells infected with AAV2-CMV-hEPO. Scale bar, 50 μm.
FIGURE S4. TUNEL assay in 1.5-month diabetic rat retina treated with or without AAV2-CMV-hEPO. N: normal control; D: diabetic rats; E1 to E3: diabetic rats injected with AAV2-CMV-hEPO (E1: $1 \times 10^{13}$ GC/mL; E2: $3 \times 10^{12}$ GC/mL; and E3: $1 \times 10^{12}$ GC/mL, 3 µL/eye); E0: diabetic rats injected with hEPO protein (16 mU/eye); NC: negative control; PC: positive control. n=4/group; Scale bar, 50 µm.
**FIGURE S5.** Protecting retinal thickness in STZ-diabetic rat by AAV2-CMV-hEPO administration. N: normal control; D: diabetic rats; E2: diabetic rats injected with AAV2-CMV-hEPO (3×10¹² GC/mL, 3 µL/eye); E0: diabetic rats injected with hEPO protein (16 mU/eye). n=5, each datum was expressed as mean ± S.E., ** means P<0.01 when compared with the diabetic group.