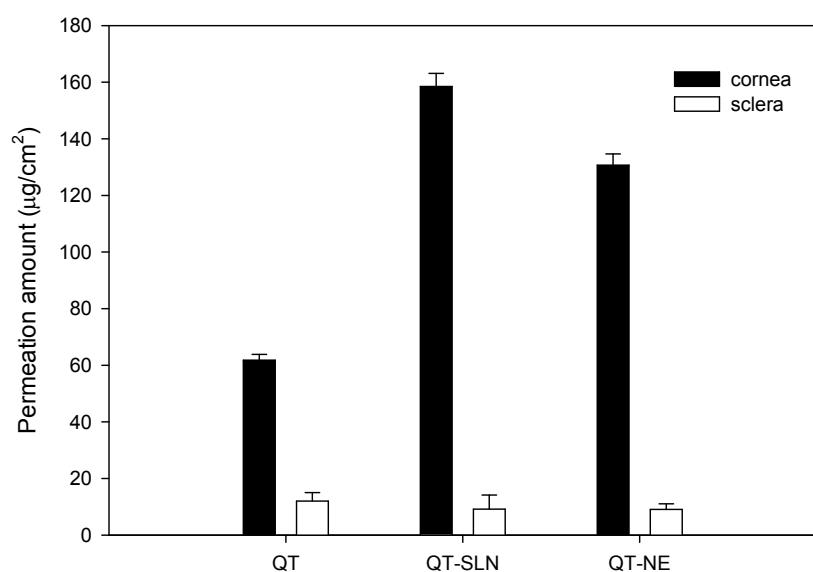


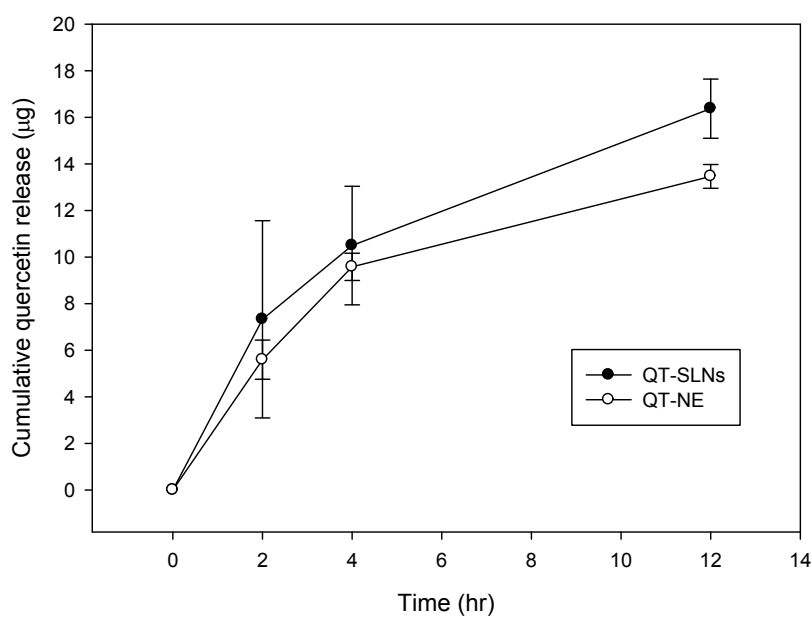
1 Supplementary information



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3 Fig S1. The permeation of quercetin in cornea and sclera by using nanocarriers after 24 hours.

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6 Fig S2. The release of quercetin in simulated tear fluid by using nanocarriers.

7 In vitro release studies of quercetin were performed in static Franz diffusion cells. The cell consisted of
8 donor and receptor chambers between which a membrane was positioned. A PVDF membrane (Millipore,
9 Germany) with an average pore size of 100nm was used as a barrier to prevent the entrance of nanocarriers
10 to the receptor liquid. Total volume of 1 ml dispersion (containing 2000µg quercetin) was applied to the
11 donor compartment. The composition of simulated tear fluid includes sodium bicarbonate (0.20%), calcium
12 chloride (0.01%), sodium chloride (0.67%) and water (99.12%). The receptor fluid (5.5 mL) consisted of
13 simulated tear: ethanol (4:1) (v/v). The addition of 20% ethanol in the receptor medium was chosen because
14 of the insufficient solubility of lutein in aqueous buffer. Each receptor chamber contained a stirring magnetic
15 bar to maintain the solution homogeneity. The temperature of receptor chamber was controlled at 32 °C by a
16 water circulator. The whole buffer in the receptor chamber was taken and fresh buffer was replenished at
17 fixed intervals. Quercetin in the receptor chamber was analyzed by HPLC.

1

2 Table S1. Comparative summary for QT-SLNs and QT-NE

	QT-SLNs	QT-NE
Size by TEM (nm)	324.2	162.7
Corneal penetration depth (μm)	75	60
Scleral penetration depth (μm)	60	30
Protection against H_2O_2 in SIRC	good	fair
Protection against H_2O_2 in RGC	good	fair
Corneal flux ($\mu\text{g cm}^{-2} \text{day}^{-1}$)	158.5	130.7
Scleral flux ($\mu\text{g cm}^{-2} \text{day}^{-1}$)	9.2	9.1
IC_{50} in SIRC ($\mu\text{g mL}^{-1}$)	268.8	168.4
IC_{50} in RGC ($\mu\text{g mL}^{-1}$)	211.3	113.1

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