

Supplementary Materials: A Long-Acting Curcumin Nanoparticle/In Situ Hydrogel Composite for the Treatment of Uveal Melanoma

Lingxiao Xie, Weizhou Yue, Khaled Ibrahim and Jie Shen

Optical properties of CO-HA Gel and NP/CO-HA composites

The developed Gel 1 and NP/Gel 1 composites (40 μ L) were placed in a 96-well plate and incubated at 37 $^{\circ}$ C to form hydrogels. The transmittance spectra of the samples were determined using SpectraMax iD3 (Molecular Devices, LLC., San Jose, CA, USA) in a wavelength range of 300–800 nm. Deionized water (40 μ L) was studied as a control. The data was analyzed using SoftMax Pro 7.1 (Molecular Devices, LLC., San Jose, CA, USA).

The optical property (% light transmission) of CO-HA Gel 1, BLK NP or Cur NP/CO-HA composites (thickness: 125 μ m) were compared with that of DI water [72]. Excellent luminous transmittance (above 98%) and transparency were observed for our CO-HA Gel 1, which was similar to that of water (Figure S1). The presence of a high dose NP in the NP/Gel composites resulted in decreased light transmittance. The lowest transmittance of BLK NP/Gel 1 was around 70% at 380 nm. Yellowish curcumin has light absorbance at around 430 nm, which was responsible for the decreased transmittance between 380 to 480 nm wavelength. The optical property between the 380–500 nm wavelength was compromised due to the presence of NP and curcumin. Nevertheless, the transparency of Cur NP/Gel 1 and BLK NP/Gel 1 was well maintained at a sample thickness of 125 μ m as shown in Figure S1b. Overall, the developed NP/Gel composites had higher than 80% transmittance when wavelength was above 500 nm (the maximum transmittance through an entire eye is around 83.5% in this wavelength range [73]). Whether the presence of yellowish curcumin would potentially impair the visual process will be further investigated and discussed following an in vivo anti-UM dose optimization study in the future.

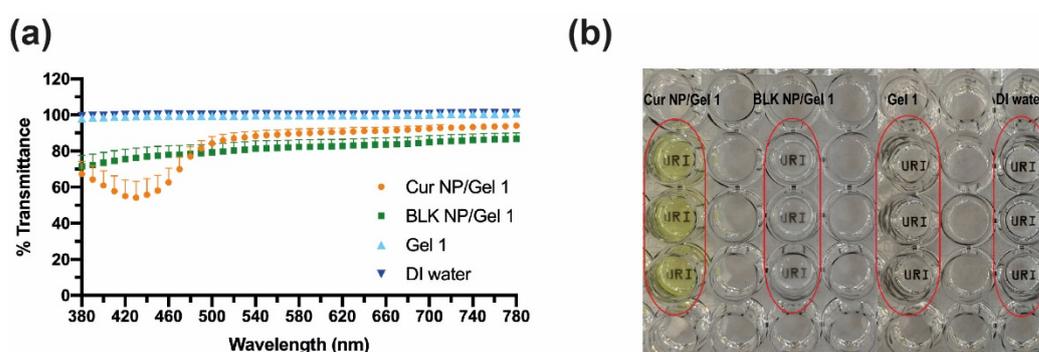


Figure S1. (a) Optical transmittance spectra and (b) photo of CO-HA Gel 1 and NP/Gel 1 composites in a 96-well plate with a 125 μ m sample thickness. Water was studied as a control.

References

- Zhou, Y.; Cai, Y.; Hu, X.; Long, Y. Temperature-responsive hydrogel with ultra-large solar modulation and high luminous transmission for “smart window” applications. *J. Mater. Chem. A* **2014**, *2*, 13550–13555.
- Boettner, E.A.; Wolter, J.R. Transmission of the ocular media. *Investig. ophthalmol. & vis. sci.* **1962**, *1*, 776–783.