

## **Supporting Information**

# **Light-induced morphological transition between unconjugated bilirubin photoisomers†**

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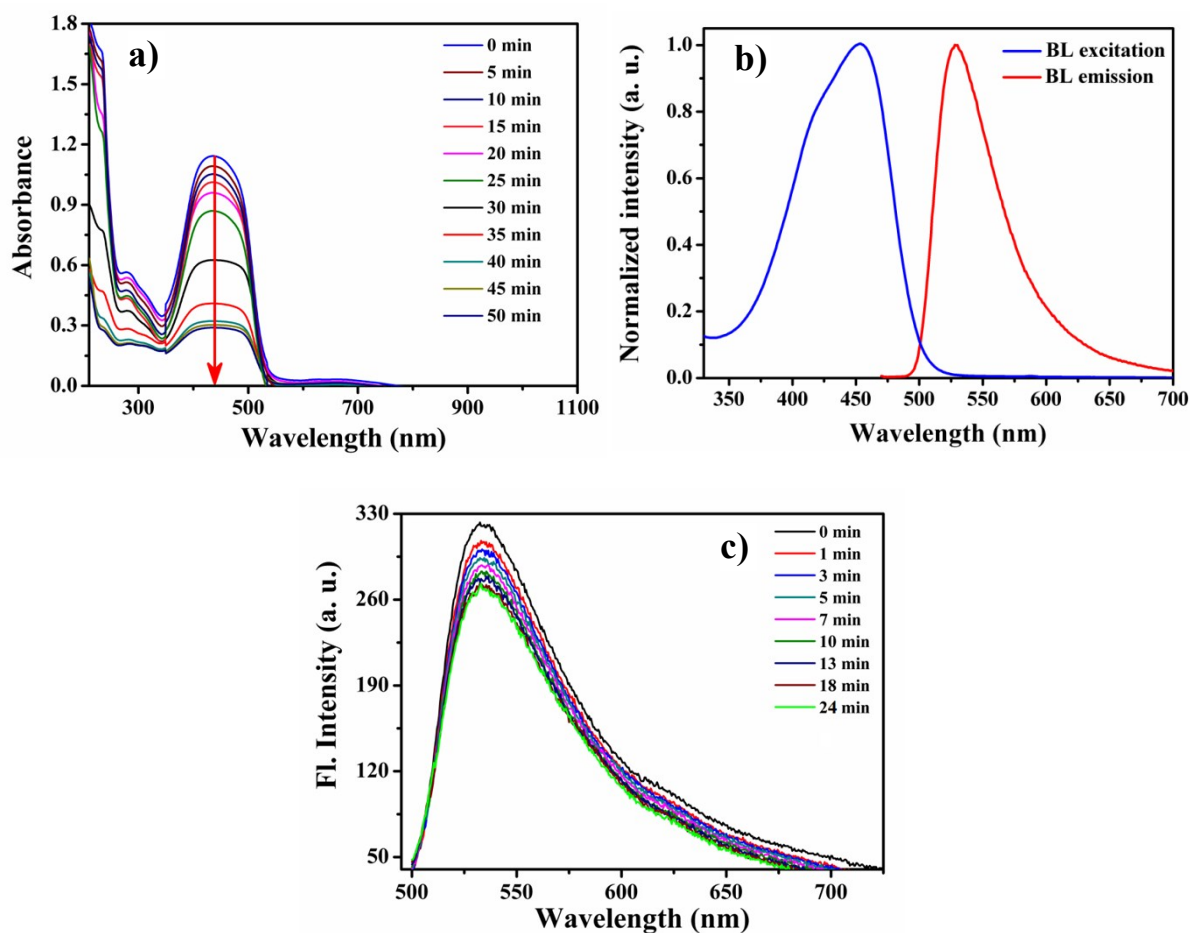
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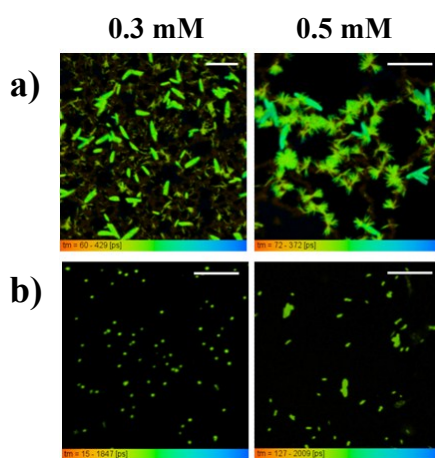
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2. **Fig. S2** (a) FLIM images of UCB (0.3 mM and 0.5 mM) and (b) corresponding 470 nm irradiated of UCB images.
3. **Fig. S3**: (a) ESI-MS spectra of UCB; before (left) and after (right) blue light irradiation and (b) reversed-phase HPLC analyses of the UCB before and after 10 min blue light (470 nm) irradiation.
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7. **Fig. S7** Two-photon excitation setup and sample collection.
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10. **Scheme S1** Plausible aggregation pattern and molecular packing for two different morphologies of UCB photoisomers.

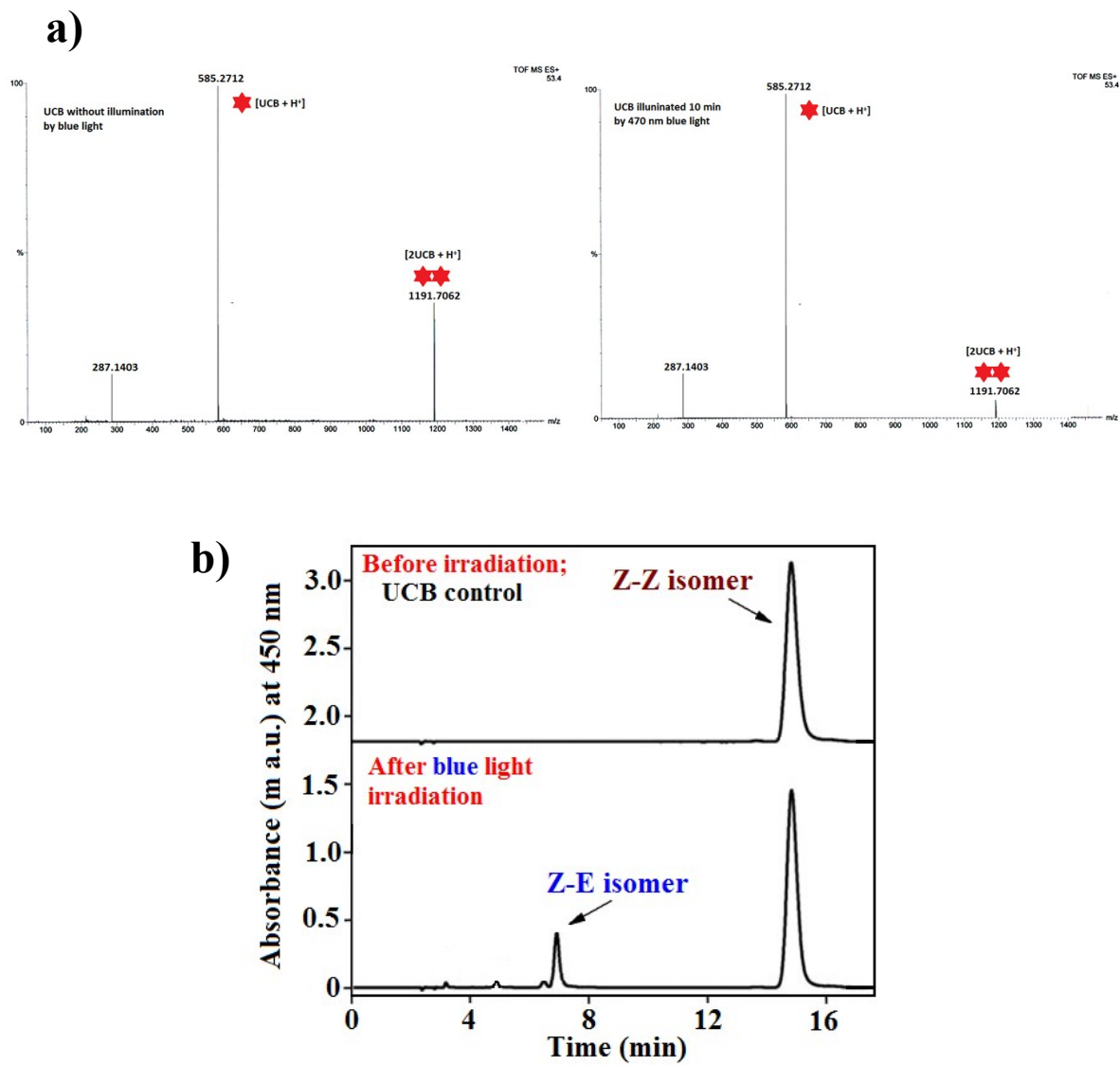
## Supporting Figures



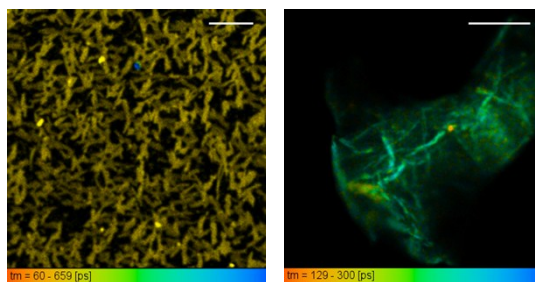
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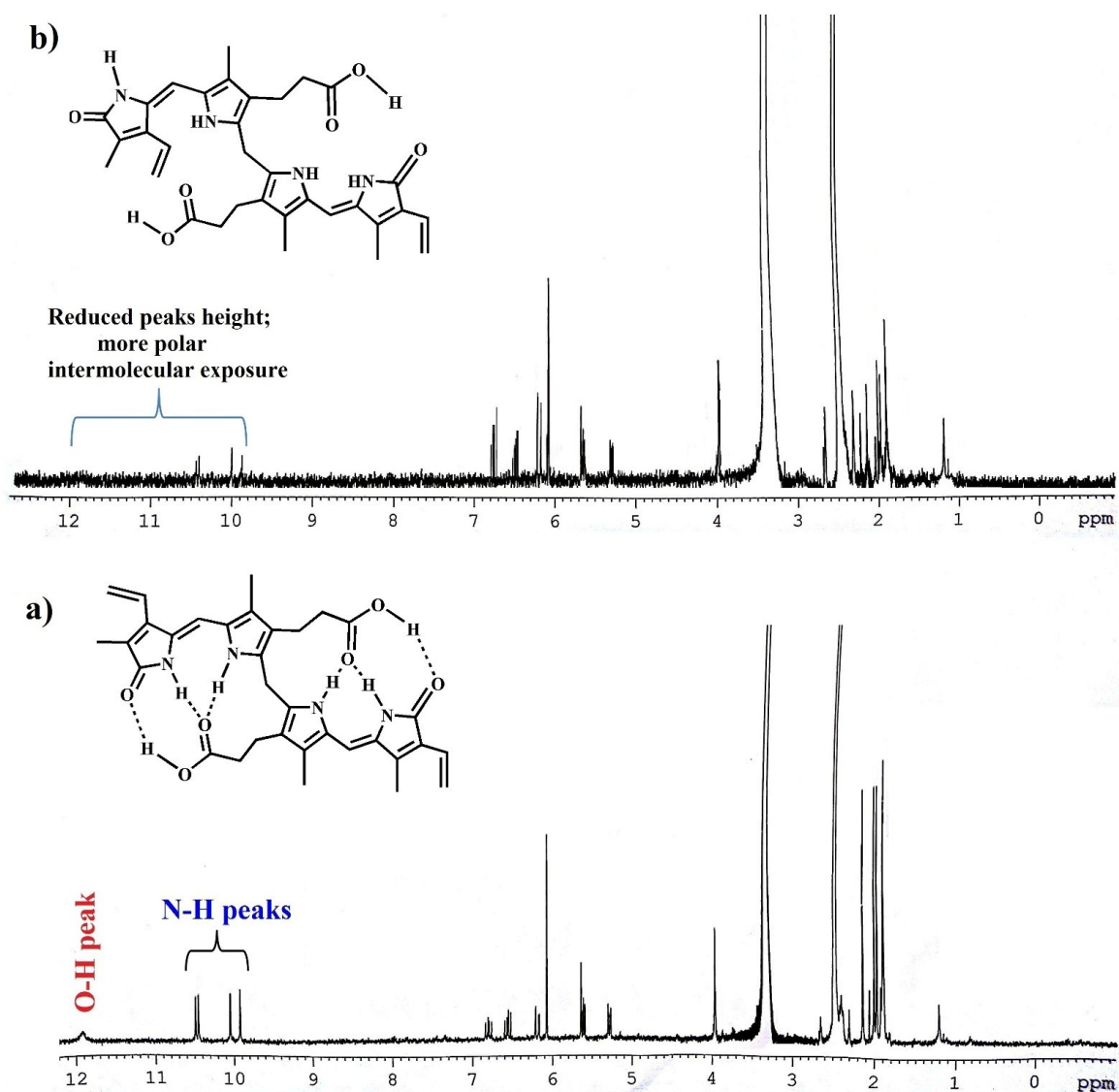
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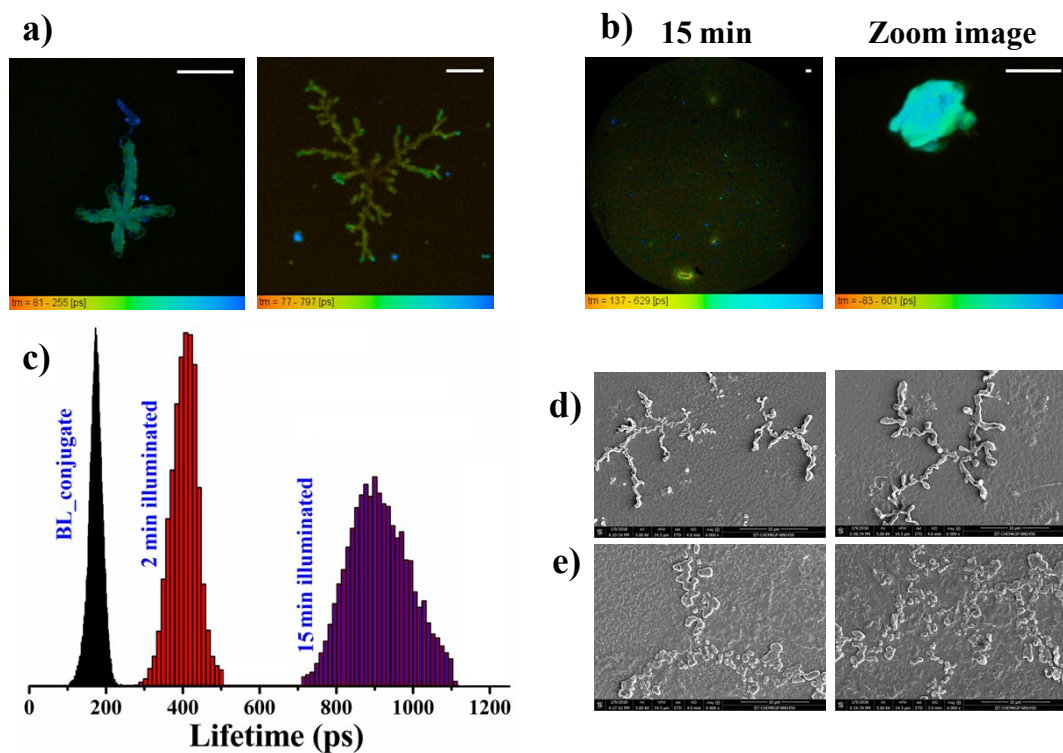
**Fig S3:** (a) ESI-MS spectra of UCB; before (left) and after (right) blue light irradiation and (b) reversed-phase HPLC analyses of the UCB before and after 10 min blue light (470 nm) irradiation.



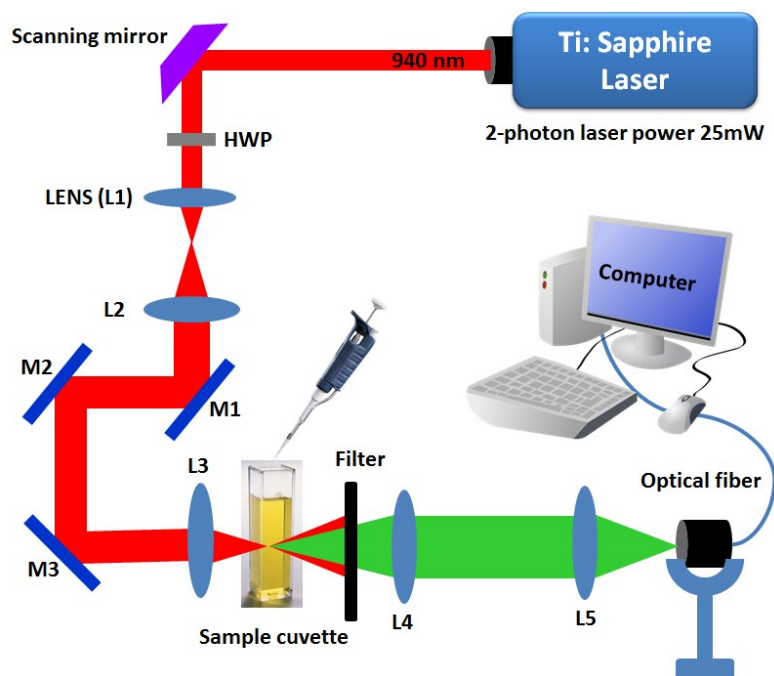
**Fig. S4** Solution state elongated morphology formation of UCB under FILM microscope.



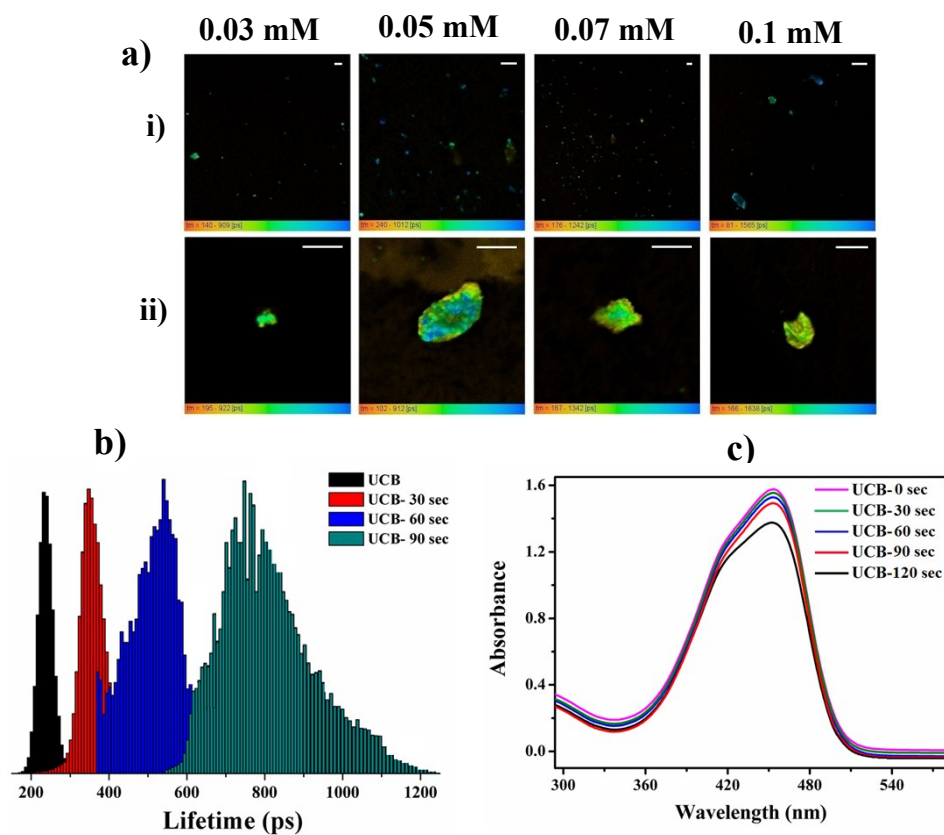
**Fig. S5**  $^1\text{H}$ NMR spectra of (a) UCB (0.05 mM) and (b) illuminated (470 nm light, 10 min) UCB in  $\text{dms}\text{-d}_6$ .



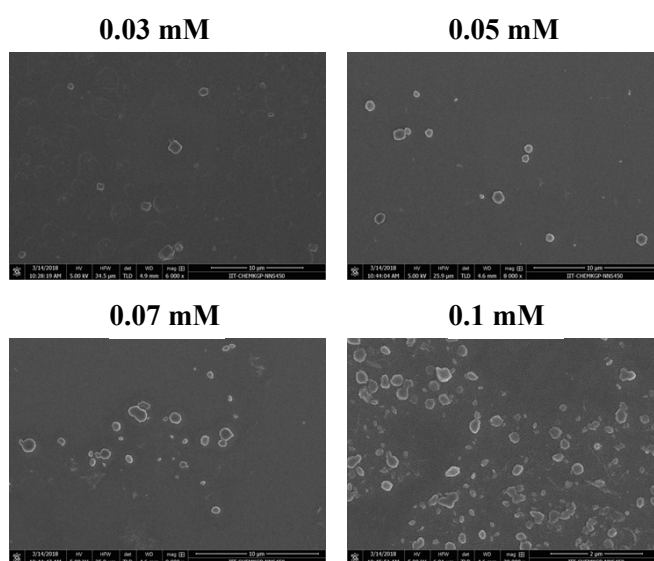
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**Fig. S7** Two-photon excitation setup and sample collection.

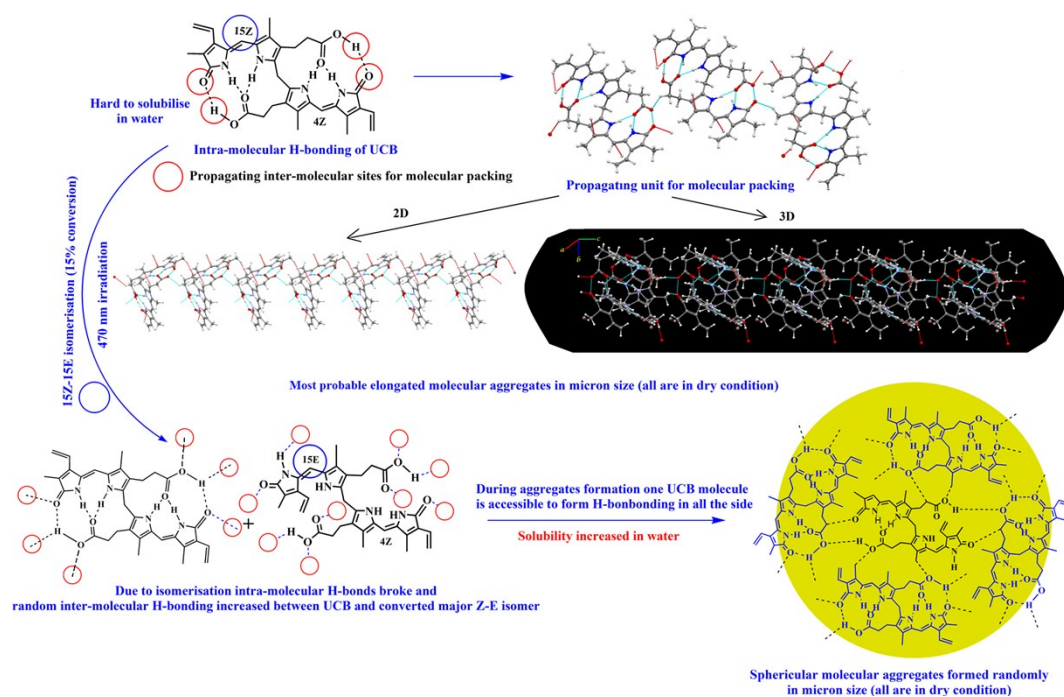


**Fig. S8** (a) (i) FLIM study of unconjugated bilirubin illuminated by two-photon ( $\lambda_{\text{ex}} = 940$  nm) excitation and (ii) their corresponding zoom images (all scale bar is  $3 \mu\text{m}$ ); (b) lifetime distributions of  $0.1 \text{ mM}$  UCB with increasing two-photon ( $\lambda_{\text{ex}} = 940$  nm) exposure time and (c) their corresponding absorbance study.



**Fig. S9** FESEM images of illuminated UCB by two-photon irradiation ( $\lambda_{\text{ex}} = 940$  nm).





**Scheme S1** Plausible aggregation pattern and molecular packing for two different morphologies of UCB photoisomers.