Electronic Supplementary Information (ESI) for

Incorporation of quantum dots in silk biomaterials for fluorescence imaging

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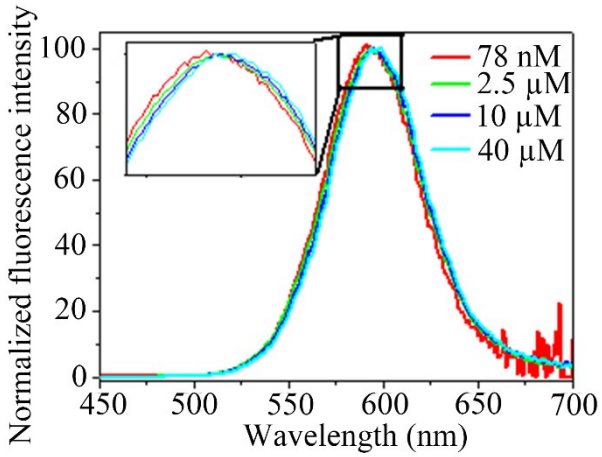

Figure S1. Fluorescence spectra of QDs at different concentrations.

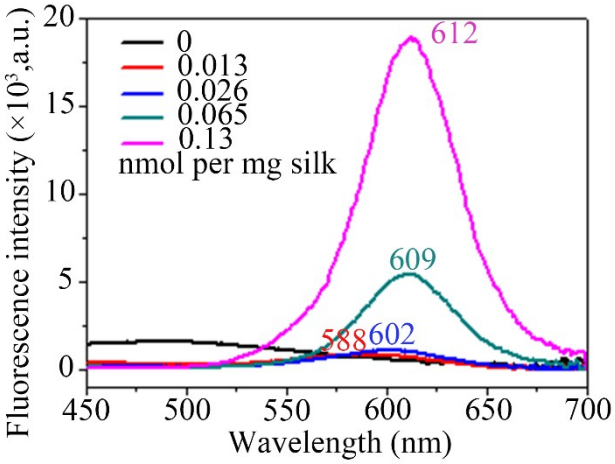

Figure S2. Fluorescence spectra of silk/QDs hydrogels loaded with different amounts of QDs.

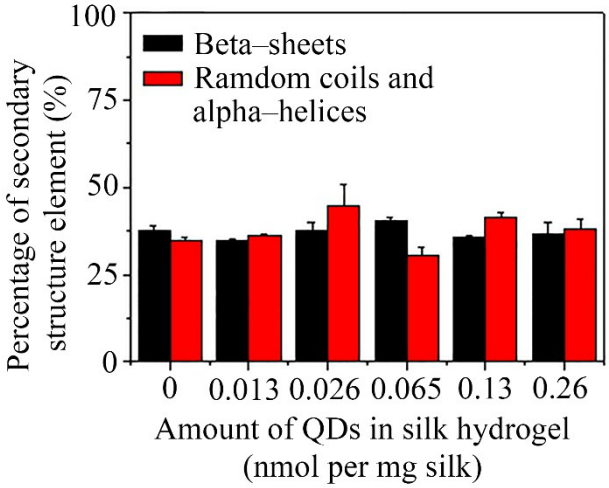

Figure S3. Quantitative analysis of secondary structures in silk hydrogel by deconvolution of Amide I peaks (1616-1637 cm^{-1}) in Figure 2A.

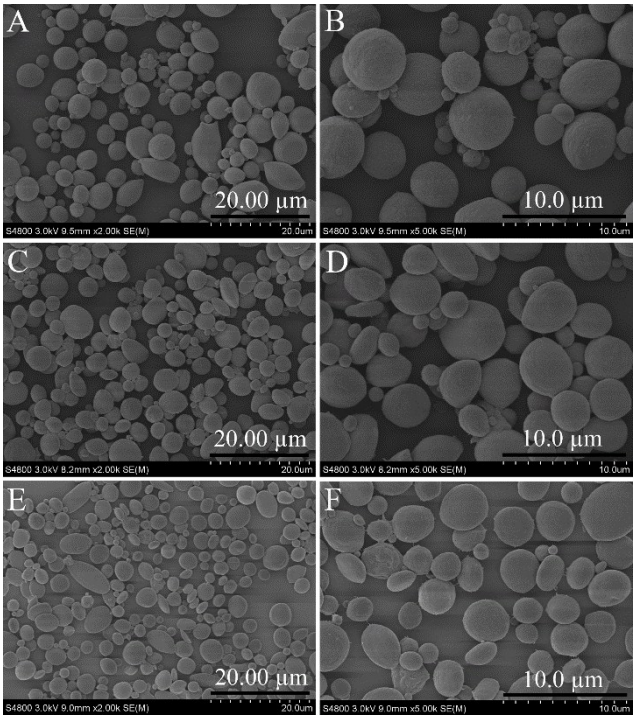

Figure S4. Silk microsphere morphologies determined by SEM. A, B, silk microspheres. C, D, silk/QDs microspheres with low QDs loading (0.013 nmol/ mg silk). E, F, silk/QDs microspheres with high QDs loading (0.13 nmol/ mg silk). Bar = 20 μm in A, C, E; 10 μm in B, D F.

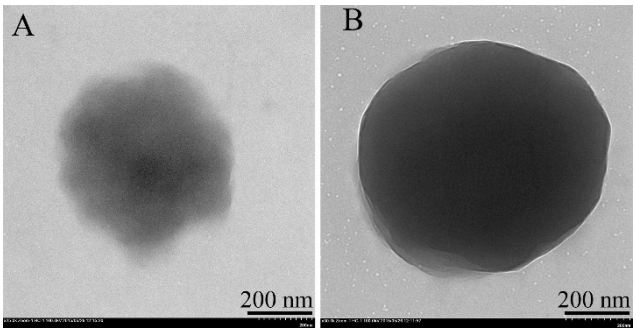

Figure S5. TEM images of silk and silk/QDs microspheres. A: silk microspheres. B: silk/QDs microspheres with high QDs loading (0.13 nmol/ mg silk). Bar = 200 nm.

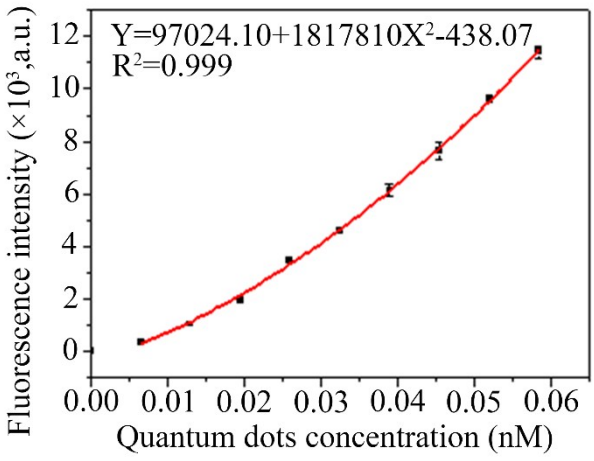

Figure S6. Standard curve of QDs fluorescence intensity versus concentrations.

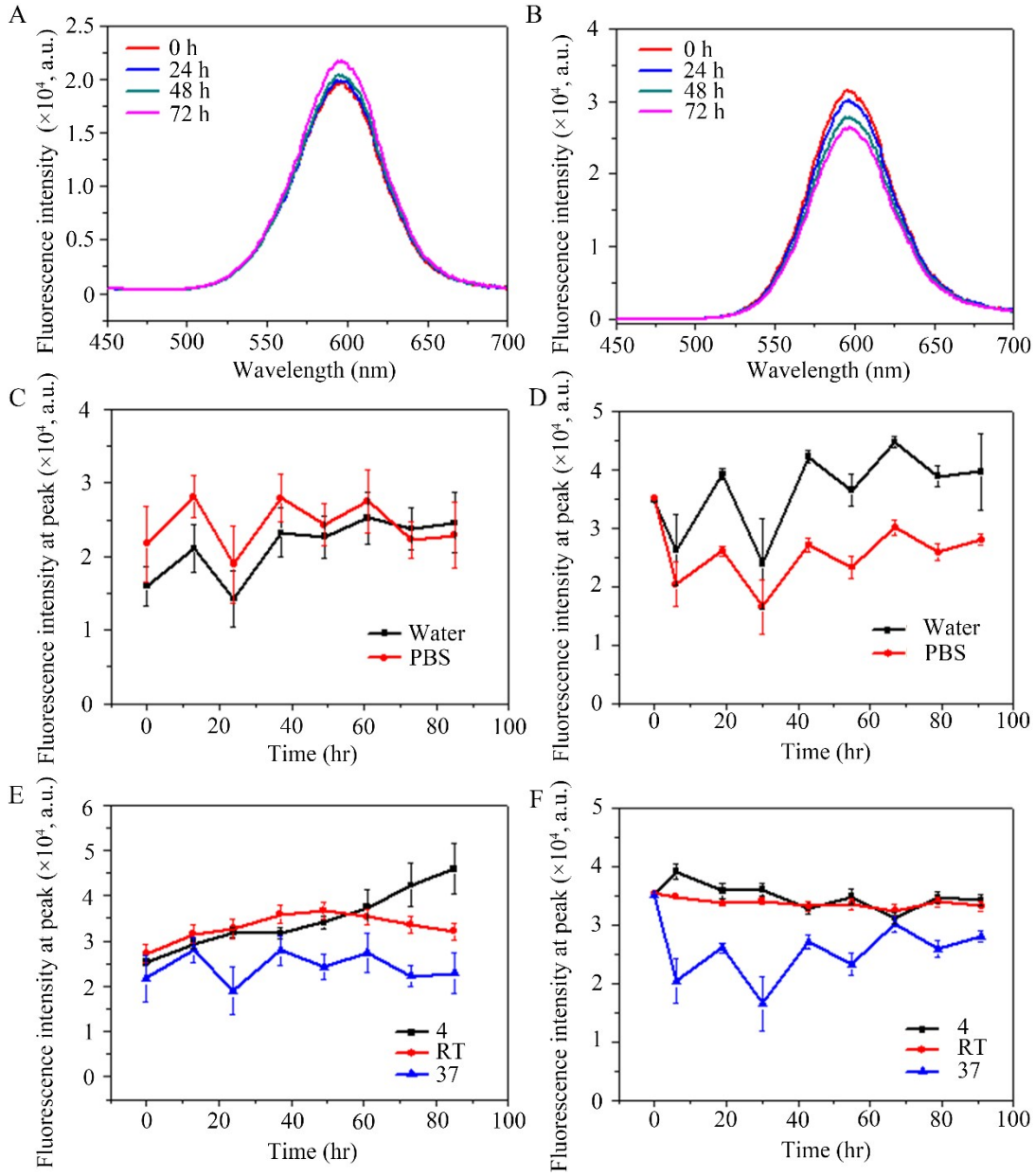

Figure S7. Influence of solution conditions and temperature on fluorescence of QDs incorporated in silk microspheres (A, C, E) and QDs (B, D, F). A, B: fluorescence spectra taken of silk/QDs microsphere samples and QDs incubated in water at various time points. C, D: dynamic fluorescence change of silk/QDs microsphere samples and QDs incubated in water and PBS at 37°C. E, F: dynamic fluorescence change of silk/QDs microsphere samples incubated in PBS at 4°C, room temperature and 37°C. The loading of QDs in silk hydrogels was 0.065 nmol per mg silk.

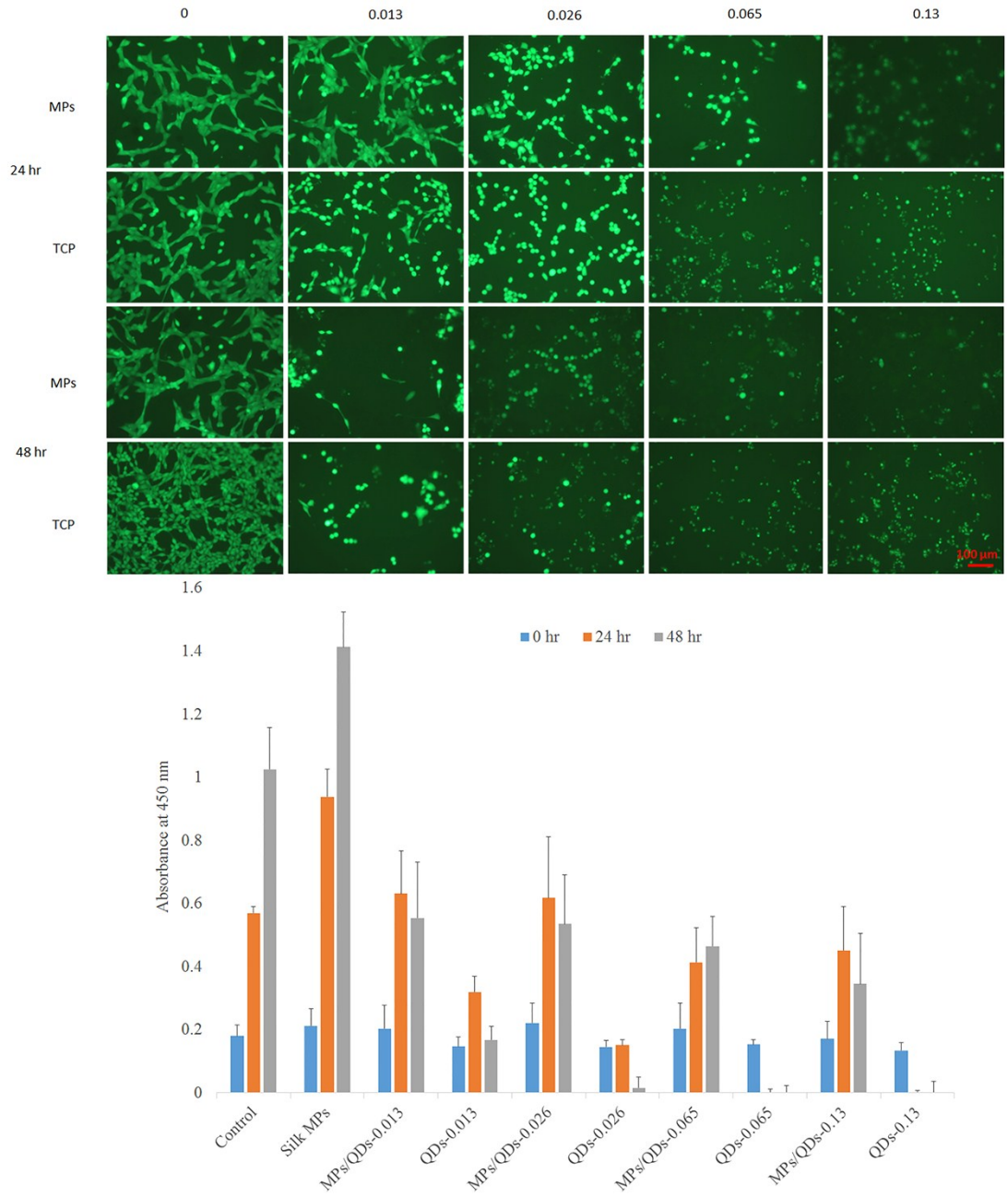

Figure S8. Human fibroblasts (HS-865-SK) cultured in medium containing silk and silk/QDs microspheres (0.013, 0.026, 0.065, 0.13 nmol/mg silk). QDs and empty wells (no materials) served as controls. The upper pictures show microscopic images taken of the cells at 24 and 48 hr after cells were exposed to the medium containing the test materials. Bar =100 µm.The lower graph shows cell viability determined by CCK-8 kit.