ACS Nano

Supporting Information

Title

Soft Nanotube Hydrogels Functioning as Artificial Chaperones

Authors

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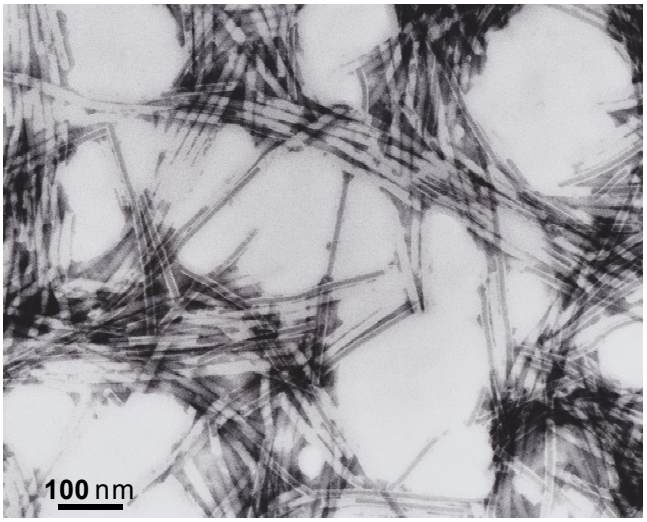

Figure S1. TEM image of the nanotubes with 10-nm inner diameter dispersed from the Alexa-hydrogel that encapsulated GFP, which was prepared by binary self-assembly of **1** and **3** in the presence of the denatured GFP.

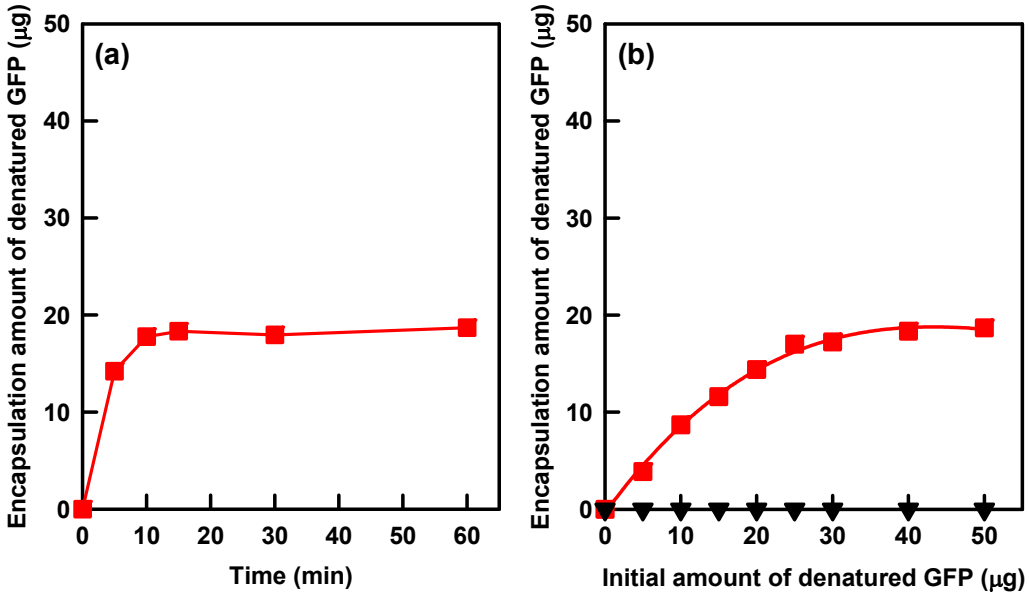

Figure S2. (a) Time dependence of the encapsulation amount of denatured GFP into the nanotube channel in the Alexa-hydrogel. [Initial amount of GFP] = 50 μg. (b) Relationship between the initial amount of denatured GFP and the amount of encapsulated denatured GFP in the Alexa-hydrogel. (■) Capsulation was carried out by the hydrogel formation in the presence of denatured GFP. (▼) Capsulation was performed by the mixing of the pre-formed Alexa-hydrogel and denatured GFP. Both hydrogels were washed by water.

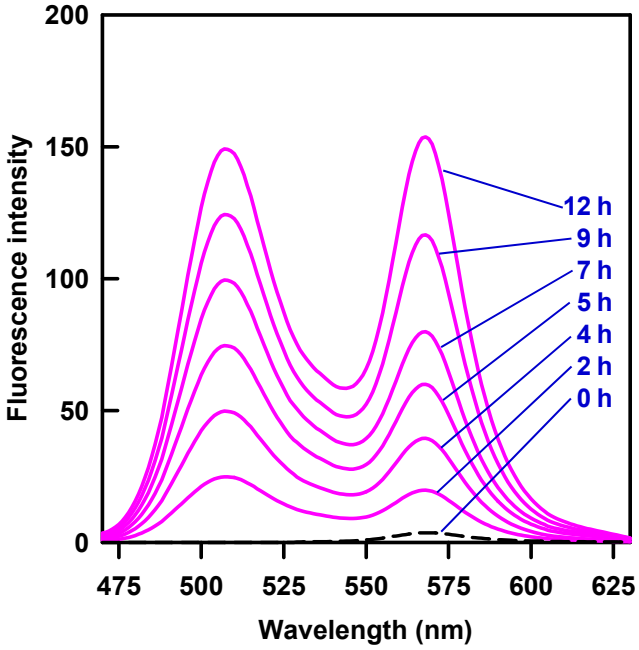

Figure S3. Fluorescence spectra of FRET from refolded GFP (donor) to the Alexa group on the inner surface of the nanotube (acceptor). Excitation wavelength: 450 nm.

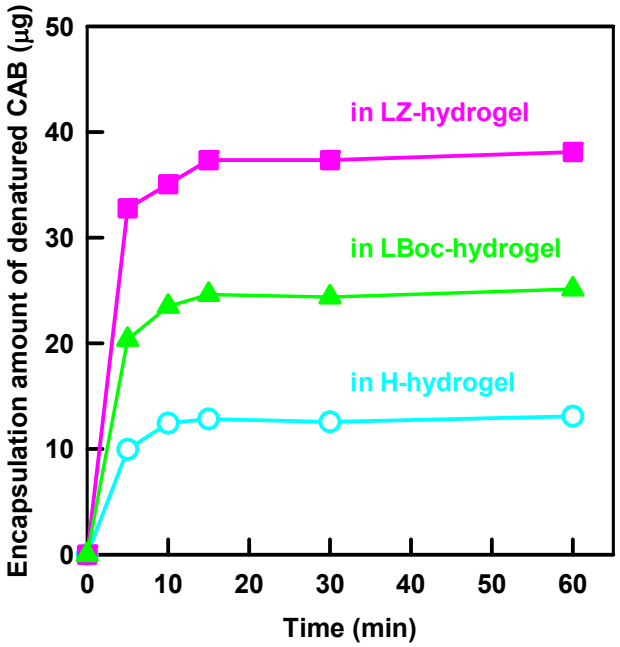

Figure S4. Time dependence of the encapsulation amount of denatured CAB into the nanotube channel in the hydrogels. [Initial amount of CAB] = 50 μg (see Figure 6a).

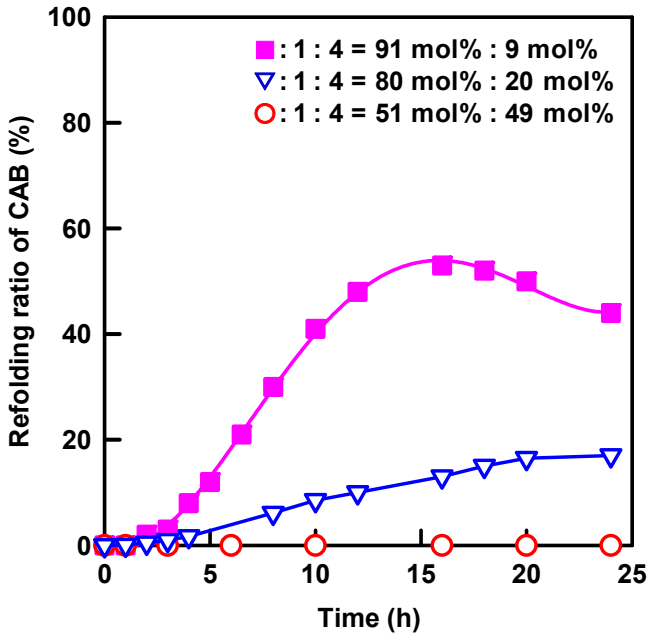

Figure S5. Time dependence of the refolding ratios of encapsulated GFP in the nanotube channel of the LZ-hydrogels composed of **1** and **4** at different ratio.

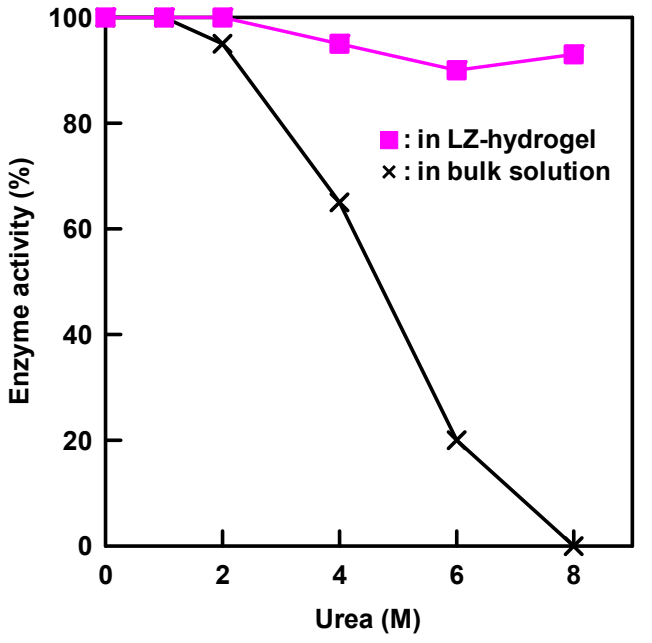

Figure S6. Chemical stability of refolded CAB in the nanotube channel of the LZ-hydrogel. The incubation time after addition of 8 M urea was 1 h.

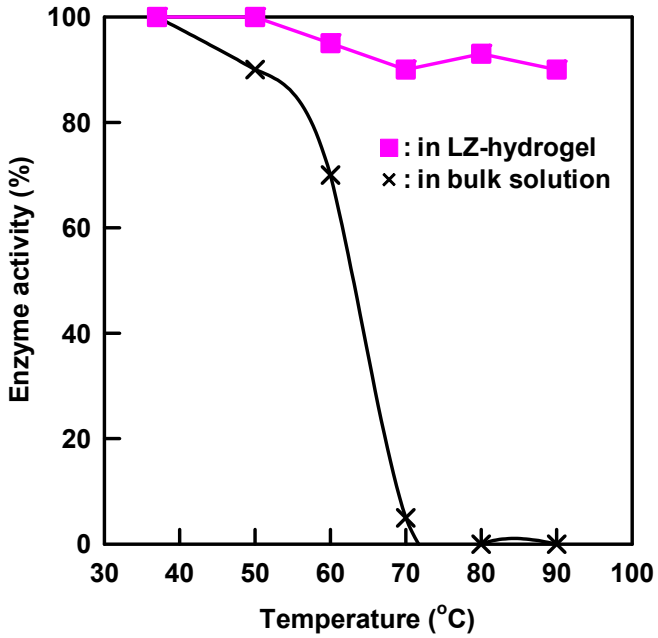

Figure S7. Thermal stability of refolded CAB in the nanotube channel of the LZ-hydrogel. The samples were incubated for 1 h after the temperature was elevated to a particular level.

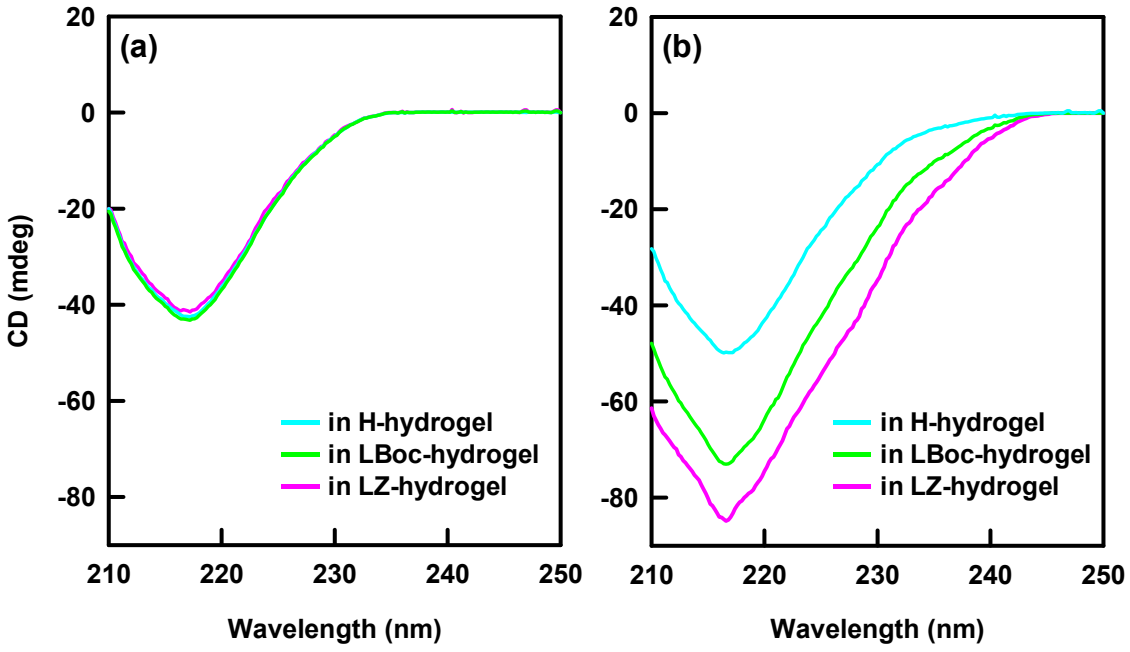

Figure S8. (a) Circular dichroism spectra of native CAB encapsulated in the various nanotube hydrogels. (b) Circular dichroism spectra of denatured CAB that was in intermediately refolded state encapsulated in the various nanotube hydrogels.

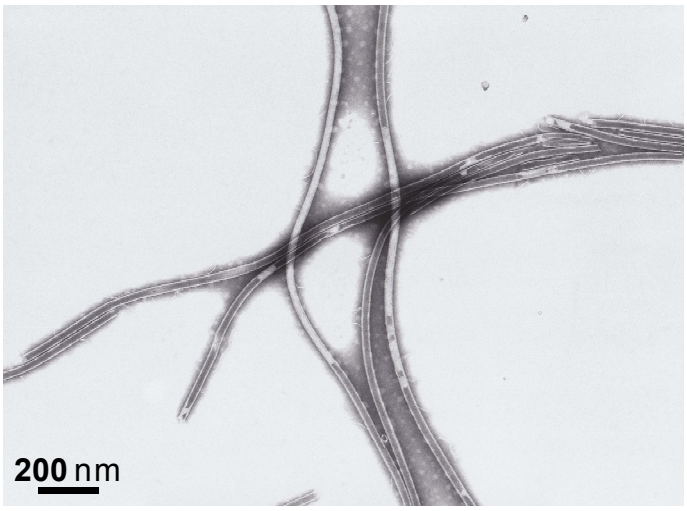

Figure S9. TEM image of the nanotubes with 20-nm inner diameter dispersed from the 20-H-hydrogel that encapsulated CS, which was prepared by self-assembly of **2** in the presence of denatured CS.

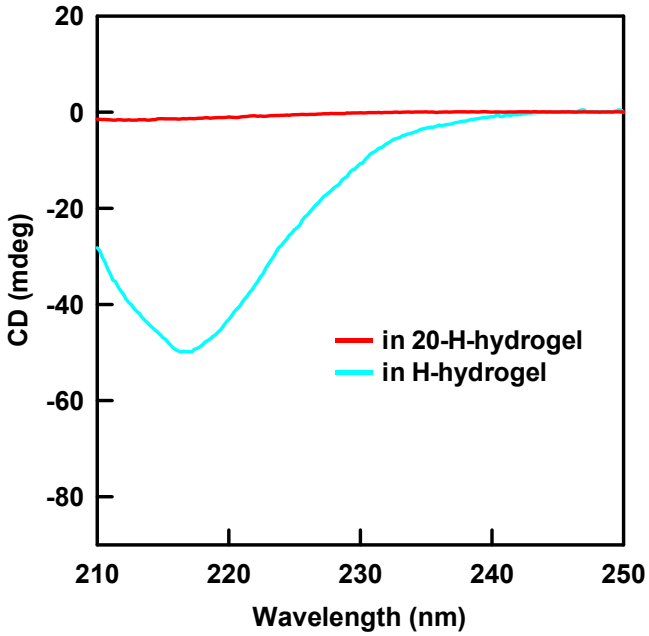

Figure S10. Circular dichroism spectra of encapsulated CAB in the nanotube hydrogels.

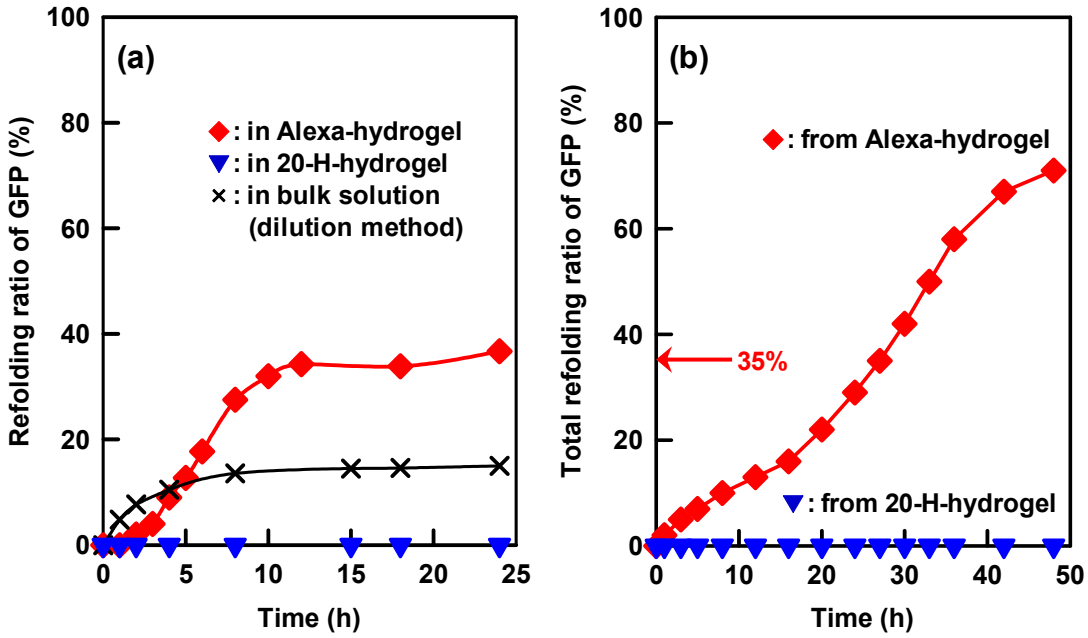

Figure S11. (a) Time dependence of the refolding ratio of encapsulated GFP (= 18 μg) in the nanotube channel of the hydrogels or the free GFP (= 18 μg) in the bulk solution (dilution method). (b) Time dependence of the total refolding ratio of the GFP released from the nanotube hydrogel into the recovery solution. [Encapsulated GFP] = 18 μg. In the case of the Alexa-hydrogel system, part (35%) of encapsulated GFP was completely refolded in the nanotube channel (refolding process I).