Supporting Information

Hierarchical self-assembly of photoluminescent CdS nanoparticles into bile acid derived organogel: morphological and photophysical properties

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POM, AFM and SEM imaging of gel–NP hybrid material

POM, AFM and SEM imaging were carried out on Olympus C3040-ADU, JPK NANO WIZARD II, and FEI sirion XL30 FEG SEM instruments, respectively. For POM, wet hybrid gel was drop cast on glass slide before experiment. The gel–NP hybrid material was drop cast on mica sheet and dried under reduced pressure for AFM imaging. AFM measurements were carried out in tapping mode at a scanning rate of 1.0 Hz. For SEM, the dried gel (xerogel) sample was drop cast on silicon wafer and coated with gold of thickness ~10 nm. The operating voltage for FESEM was 20 KeV.

TEM imaging of gel–NP hybrid material

TEM images were recorded on JEOL 2100F. For TEM imaging gel–NP hybrid was drop cast on a carbon-coated copper grid (400 square mesh) and followed by high vacuum drying. Then sample was staining with 0.1% uranyl acetate. The operating voltage for FETEM was 200 KeV.

DLS of thiol capped photoluminescent CdS NP dispersion in DMSO

DLS studies were carried out on Zetasizer Nano ZS. NP dispersion was filtered through 0.45 μm nylon membrane before measurements. Then solution was immediately used for DLS.

UV-visible, fluorescence, photoluminescent quantum yield and time resolved spectroscopy of thiol capped CdS NP in DMSO and gel–NP hybrid material

Absorption and Fluorescence measurements were carried out on a Shimadzu UV-3600 spectrophotometer and Varian Cary Eclipse fluorescence spectrometer. UV-visible absorption and emission spectra of the NP dispersion in DMSO and gel–NP hybrid material were recorded on a UV-Vis spectrophotometer and emission at room temperature using quartz cuvette. The photoluminescent quantum yields were recorded on Edinburgh Instruments FLS980 fluorescence spectrometer equipped with an integrating sphere. A light emitting diode (IBH, nano LED, N-390) at 390 nm was used as excitation source. Fitting and analysis was performed using Origin8 and Xmgrace software.

Table S1. Gelation behavior of Bile-Acid-Derived Dimeric amide Organogelator **1**

Solvent	*Comment*
Toluene	*S*
m-Xylene	*S*
n-butanol	*S*
1-dodecanol	*S*
Acetonitrile	*S*
N,N-Dimethylformamide	*S*
Dimethyl sulfoxide	*G*
1,4-dioxane	*G*
Benzonitrile	*S*
Benzaldehyde	*S*
Ethyl acetate	*S*
Carbon tetracholride	*S*
Acetone	*G*
Tetrahydrofuran	*S*

G=gel; S= solution

Thermal stability of the Organogel 1

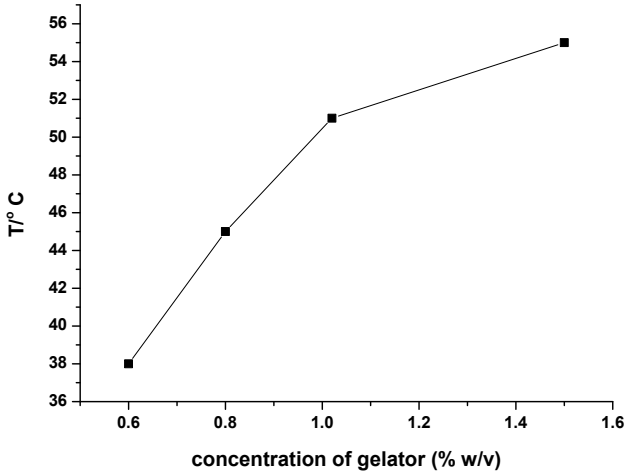


Fig S1. Gel melting temperatures of the organogel **1** prepared in DMSO.

X-ray powder diffraction study

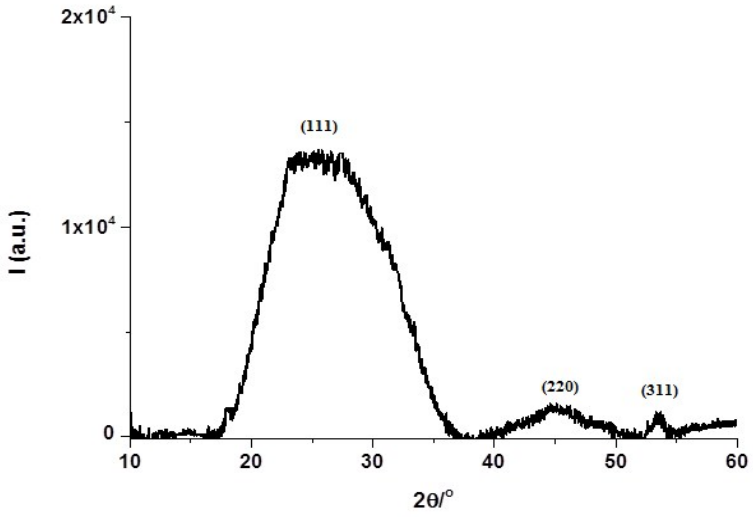


Fig S2. Powder XRD patterns of thiol capped CdS NPs.

The pXRD pattern of bile acid derived thiol capped CdS NP has three major peaks at the angles (2θ) of 26.56°, 43.79° and 52.85°, which were indexed as (111),(220) and (311) planes, respectively, suggesting cubic CdS crystal lattice (JCPDS no.75-1549).

Rheology of the gel–NP hybrid material

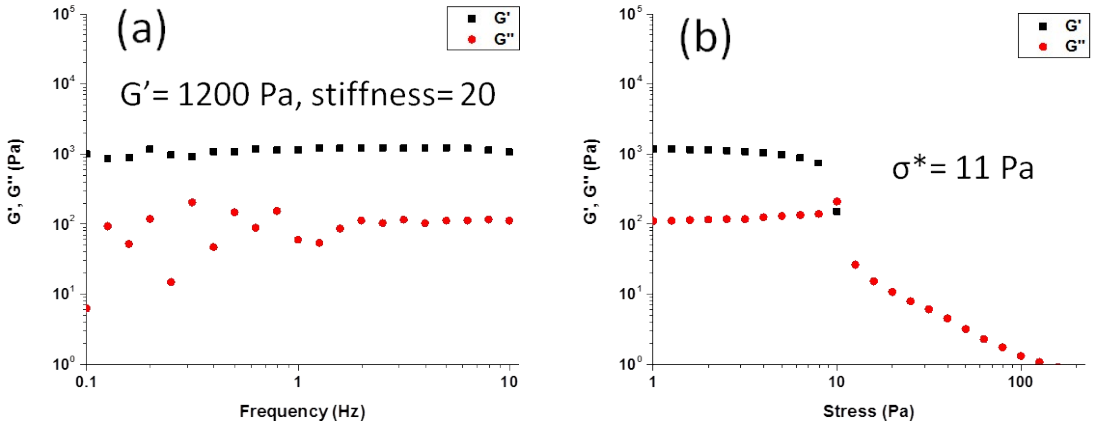


Fig S3. Rheology of gel-NP hybrid (1% w/v of gelator **1** and 0.65 µM of CdS NPs at 25 °C). (a) G' and G" versus frequency and (b) G' and G" versus applied stress.

POM image of the gel–NP hybrid material

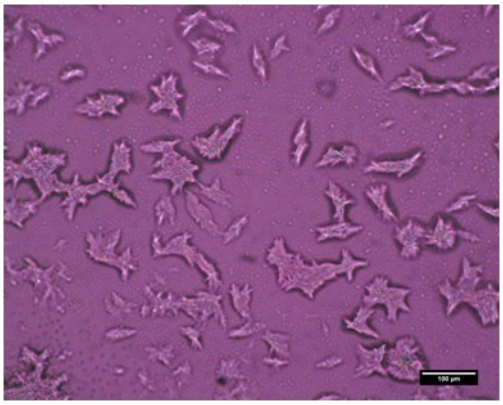


Fig S4. POM image of gel-NP hybrid (scale bar:100 μm).

Additional SEM images of the organogelator 1

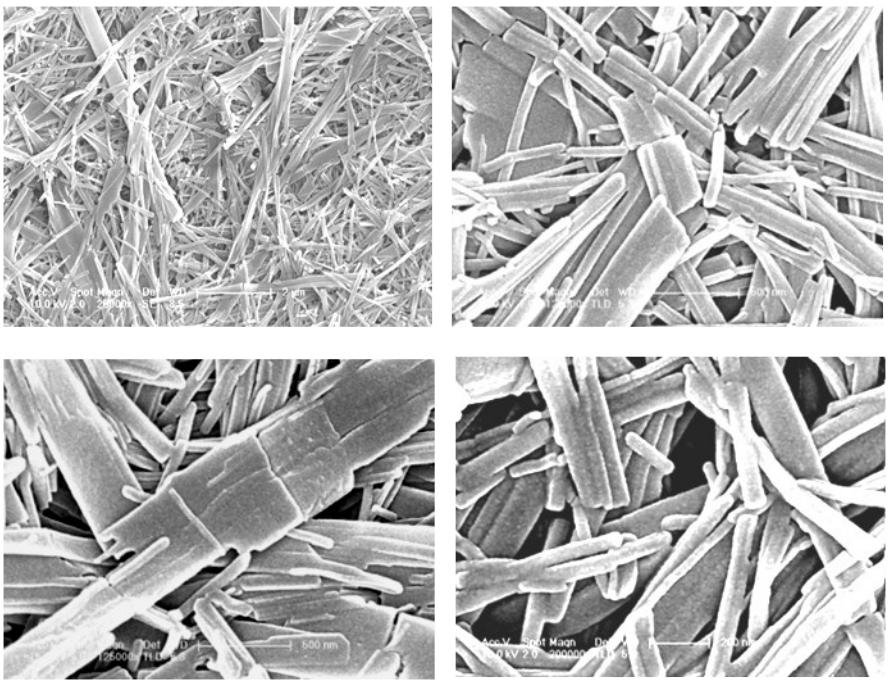


Fig S5. SEM images of organogelator **1** in DMSO (1% w/v).

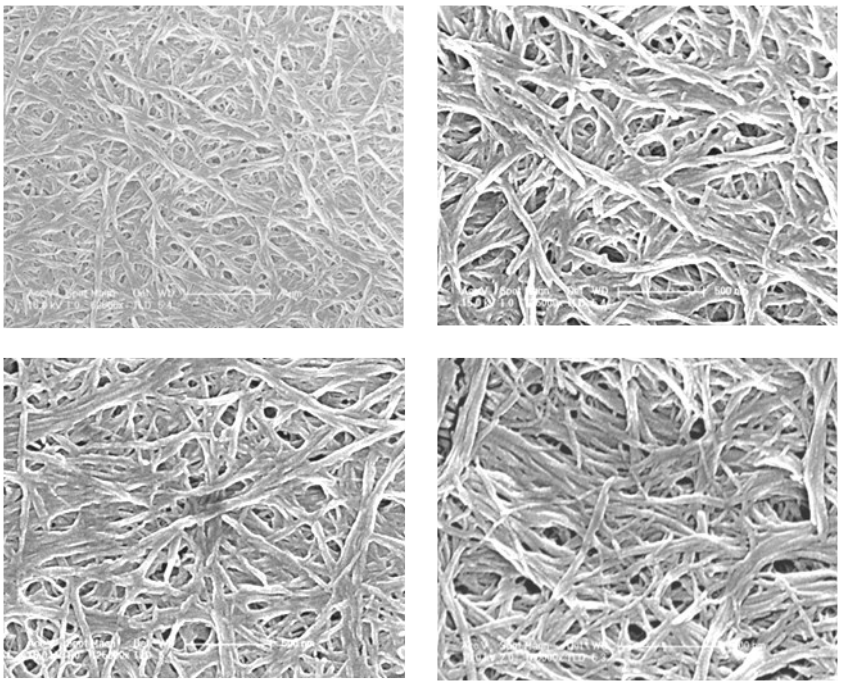


Fig S6. SEM images of organogelator **1** in acetone (1% w/v).

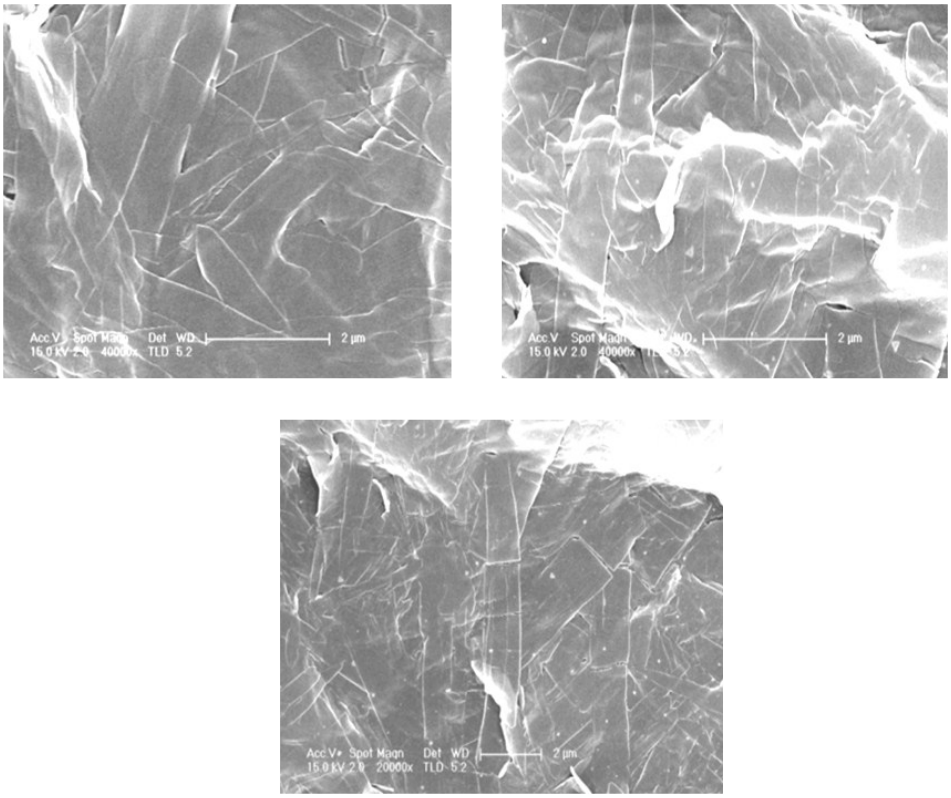


Fig S7. SEM images of organogelator **1** in 1,4-dioxane (1% w/v).

Life time curve fitting

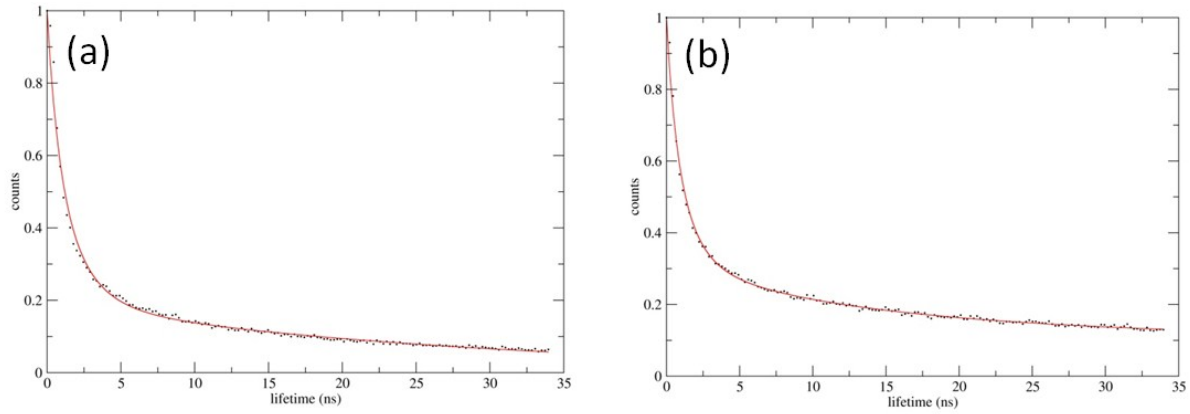
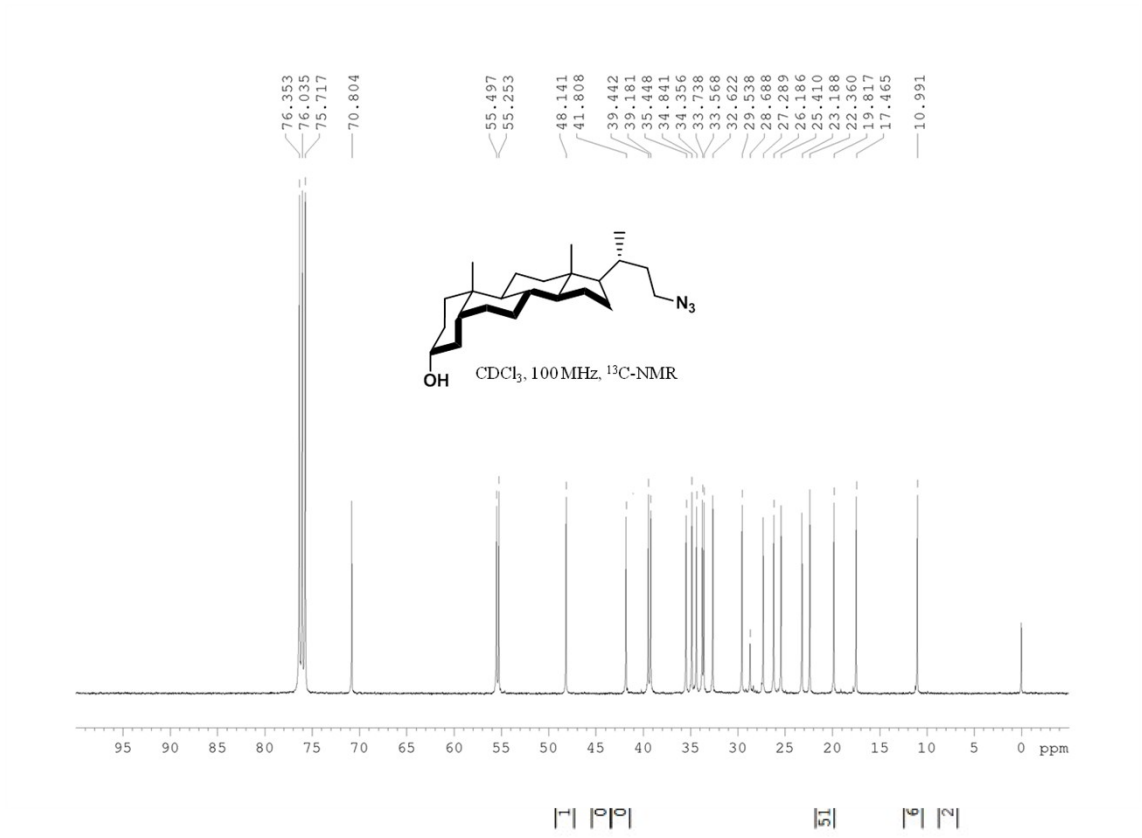


Fig S8. (a) and (b) are the results of fitted life time curves using eq 5

Copies of NMR spectra: Compound 6:


76.353
76.035
75.717
70.804
55.497
55.253
48.141
41.808
39.442
39.181
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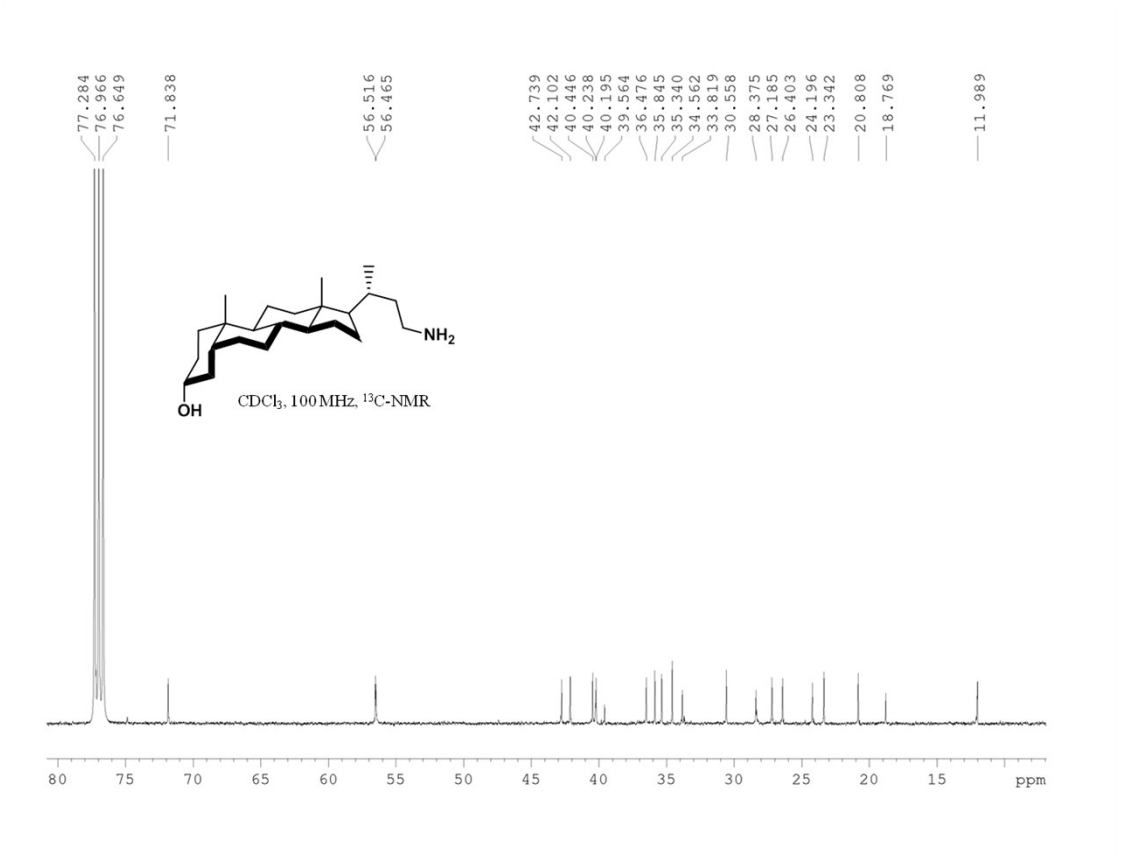
34.841
34.356
33.738
33.568
32.622
29.538
28.688
27.289
26.186
25.410
23.188
22.360
19.817
17.465
10.991
N3
OH
CDCl3, 100 MHz, 13C-NMR
95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 ppm

Copies of NMR spectra: Compound 7:



Copies of NMR spectra: Compound 1: