Electronic Supplementary Information

Incorporation of Coumarin 6 in cyclodextrins: Microcrystals to lamellar composites

Prasun Ghosh, Tarasankar Das, Arnab Maity, Somen Mondal and Pradipta Purkayastha*

Materials. C6 and CDs were bought from Sigma-Aldrich, WI, USA and used as received. Stock solution of the dye was prepared in methanol. Final concentration (0.7×10^{-3} M) of this stock solution was calculated from its absorption spectrum. Concentration of the experimental solutions, prepared in different solvents using 1% of the methanol stock, was 1×10^{-6} M. Double distilled water was used throughout the experiments.

Measurements. The absorption spectra were recorded using aVarian Cary 300 Bio UV-vis spectrophotometer. Fluorescence measurements were performed using a Horiba Jobin Yvon Fluoromax3 spectrofluorimeter. The fluorescence lifetimes were measured by the method of time-correlated single-photon counting using a picosecond spectrofluorimeter from Horiba Jobin Yvon, IBH. The instrument was equipped with FluoroHub single photon counting controller, Fluoro3PS precision photomultiplier power supply, and FC-MCP-50SC MCP-PMT detection unit. A laser head or a nano-LED pulsed diode powered by a pulsed diode controller (IBH) was used as the excitation light source. The excitation wavelength was 402 nm. The typical response time of this laser head was <100 ps. To calculate the lifetime, the fluorescence decay curves were analyzed by an iterative fitting program, DAS6, provided by IBH. For the AFM studies an NT-MDT NTEGRA instrument procured from NT-MDT, CA, USA was used. FESEM images were recorded in Carl Zeiss SUPRA 55VP FESEM. The epifluorescence images were taken using a LSM 710 with microscope axio observer Z.1, Carl Zeiss.

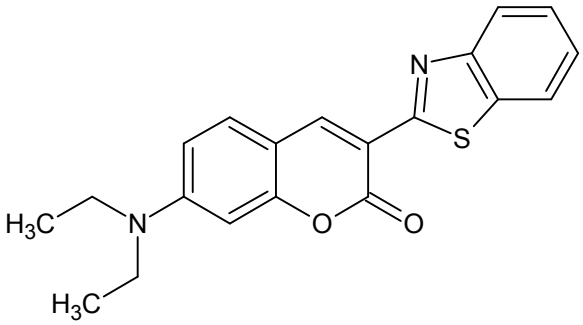

Fig. S1 Molecular structure of Coumarin 6 (C6).

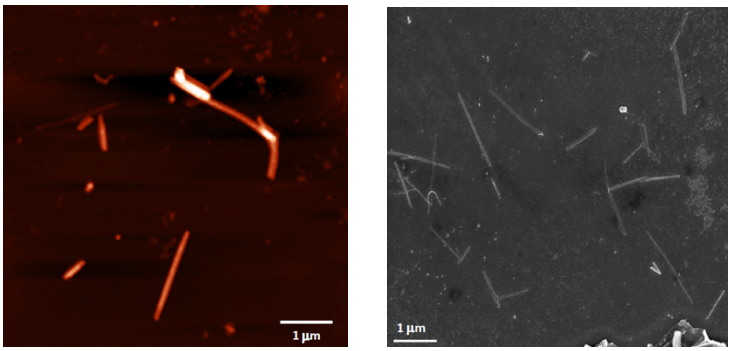

Fig. S2 Atomic force and scanning electron micrographs of C6 after incubation in water (with 1% methanol) for 30 minutes at room temperature. The final concentration of C6 was 1 µM.

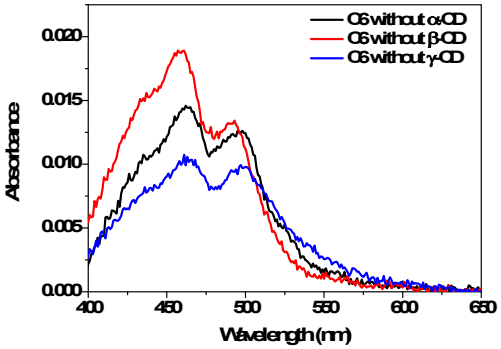

Fig. S3 Absorption spectra of C6 in absence of CDs. Three different blank 1µM C6 solutions were prepared for each set of experiments. The difference in absorbance may be due to slight variation in settling time leading to formation of different extents of C6 microcrystals.

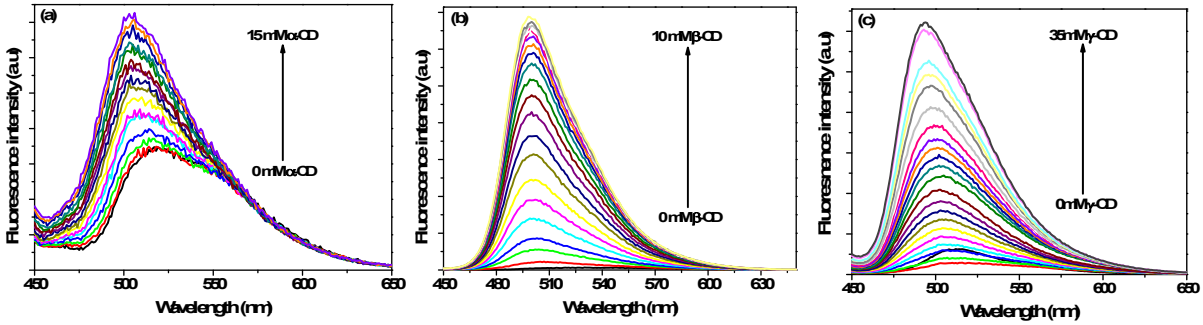

Fig. S4 Fluorescence spectra of C6 in (a) α-, (b) β- and (c) γ-CDs in aqueous environment. The samples were excited at 430 nm.

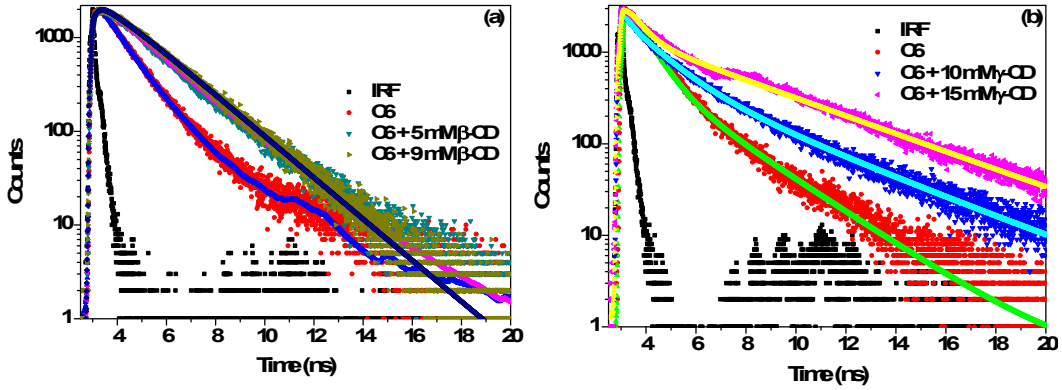

Fig. S5 Time resolved fluorescence decay profile for C6 in presence of (a) β- and (b) γ-CDs in aqueous environment. The samples were excited at 402 nm and the emissions at 525 nm were monitored.