

Supporting Information

Long-range light-modulated charge transport across molecular heterostructures doped protein biopolymers

Somen Mondal^{*a,b}, Nandan Ghorai^c, Soumyadip Bhunia^d, Hirendra. N. Ghosh^c, and Nadav Amdursky^{*a}

^aSchulich Faculty of Chemistry, Technion-Israel institute Of Technology, Haifa 3200003, Israel

^bInstitute of Chemical Technology, Mumbai, Marathwada Campus, Jalna, Maharashtra 431 203, India

^cInstitute of Nano science and Technology, Mohali, Punjab 160064, India

^dIndian Institute of Science Education and Research (IISER) Kolkata Mohanpur, West Bengal 741246, India

*Corresponding Author: Somen Mondal: s.mondal@marj.ictmumbai.edu.in,

Nadav Amdursky: amdursky@technion.ac.il

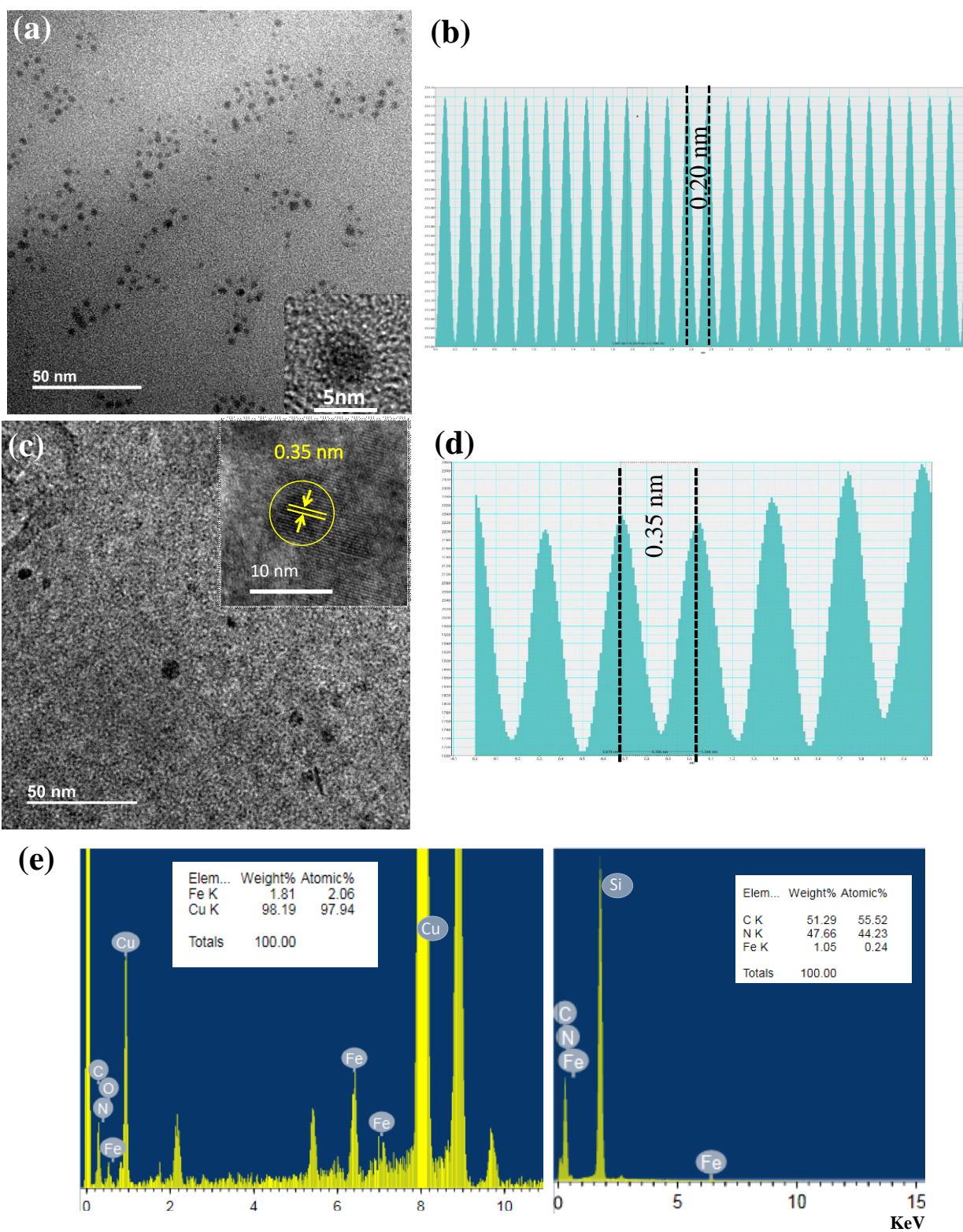


Figure S1: (a) HRTEM image (b) FFT of C-Dot (c) HRTEM image (d) FFT of C-Dot-Hemin HS (e) EDS analysis of C-Dot-Hemin HS using (left) C-coated Cu grid in a TEM setup, and (right) Si wafer in a SEM setup.

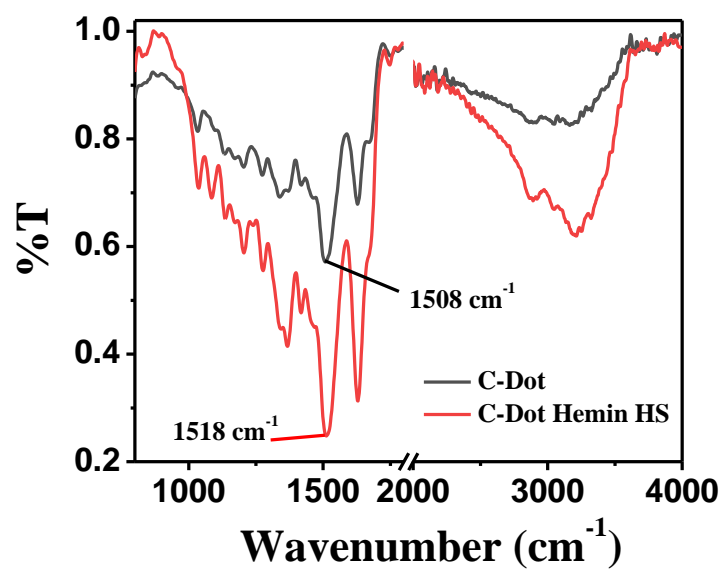


Figure S2: FTIR spectrum of C-Dot and C-Dot Hemin HS.

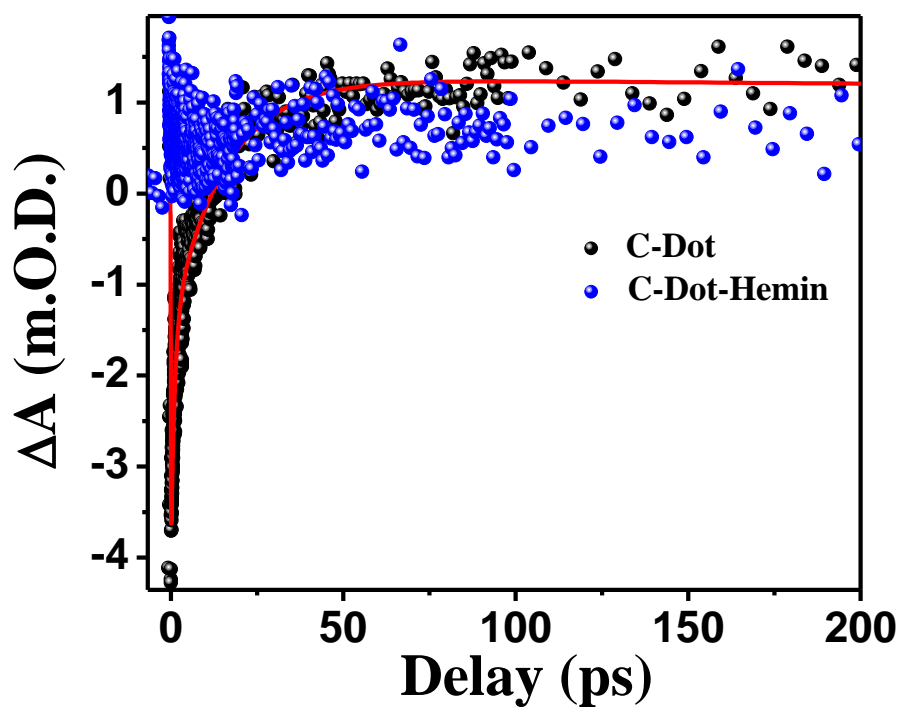


Figure S3: Kinetics of bleach recovery at 340 nm after exciting the all the samples at 320 nm laser pulse.

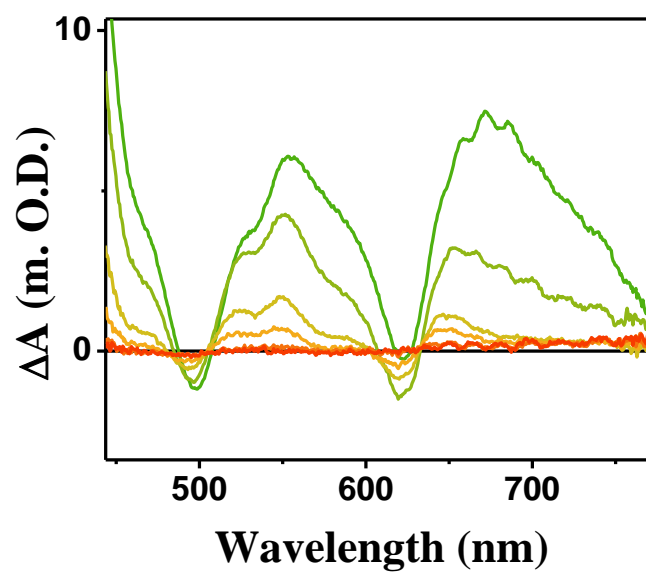


Figure S4: TA spectra Hemin in the range of 100 fs to 1 ns delay after 400 nm laser excitation and probing at UV-Vis range.

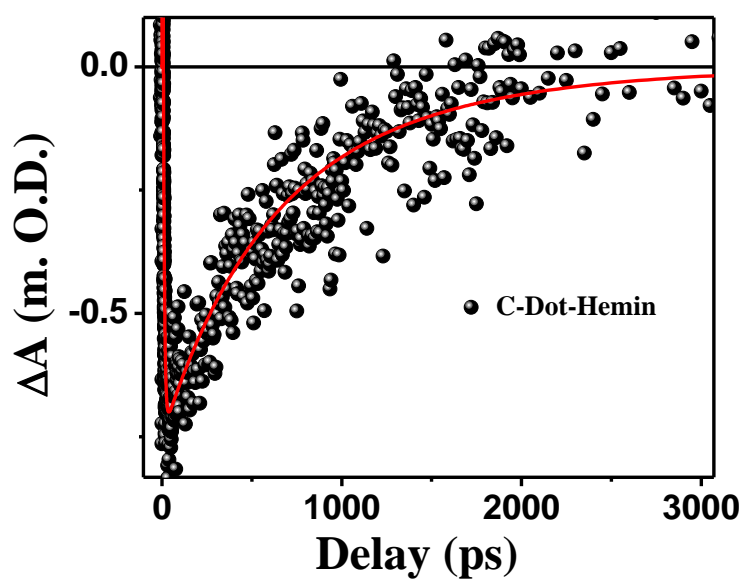


Figure S5: Kinetics of bleach recovery at 455 nm after exciting the all the samples at 400 nm laser pulse.

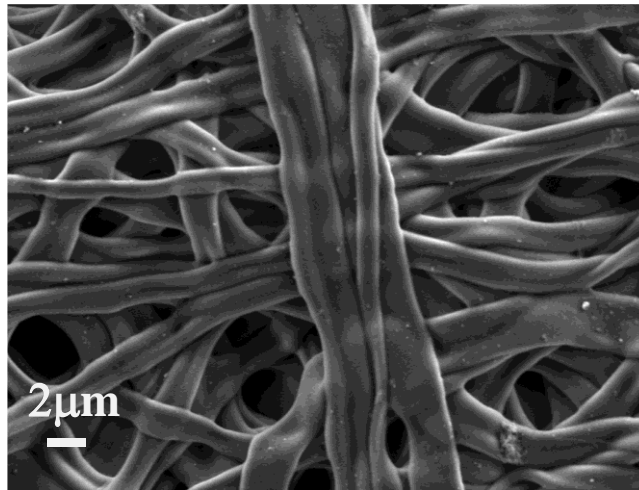


Figure S6: SEM image of BSA mat

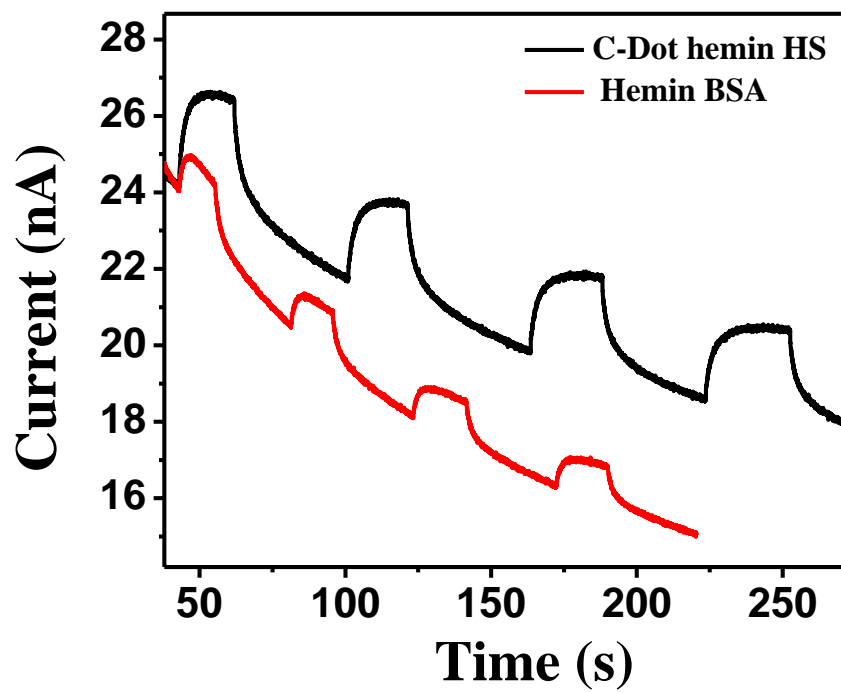


Figure S7: Current vs time plot at fixed bias voltage 0.5 V of hemin (red) and C-Dot-Hemin HS (black) doped BSA mats measured with Au electrodes.

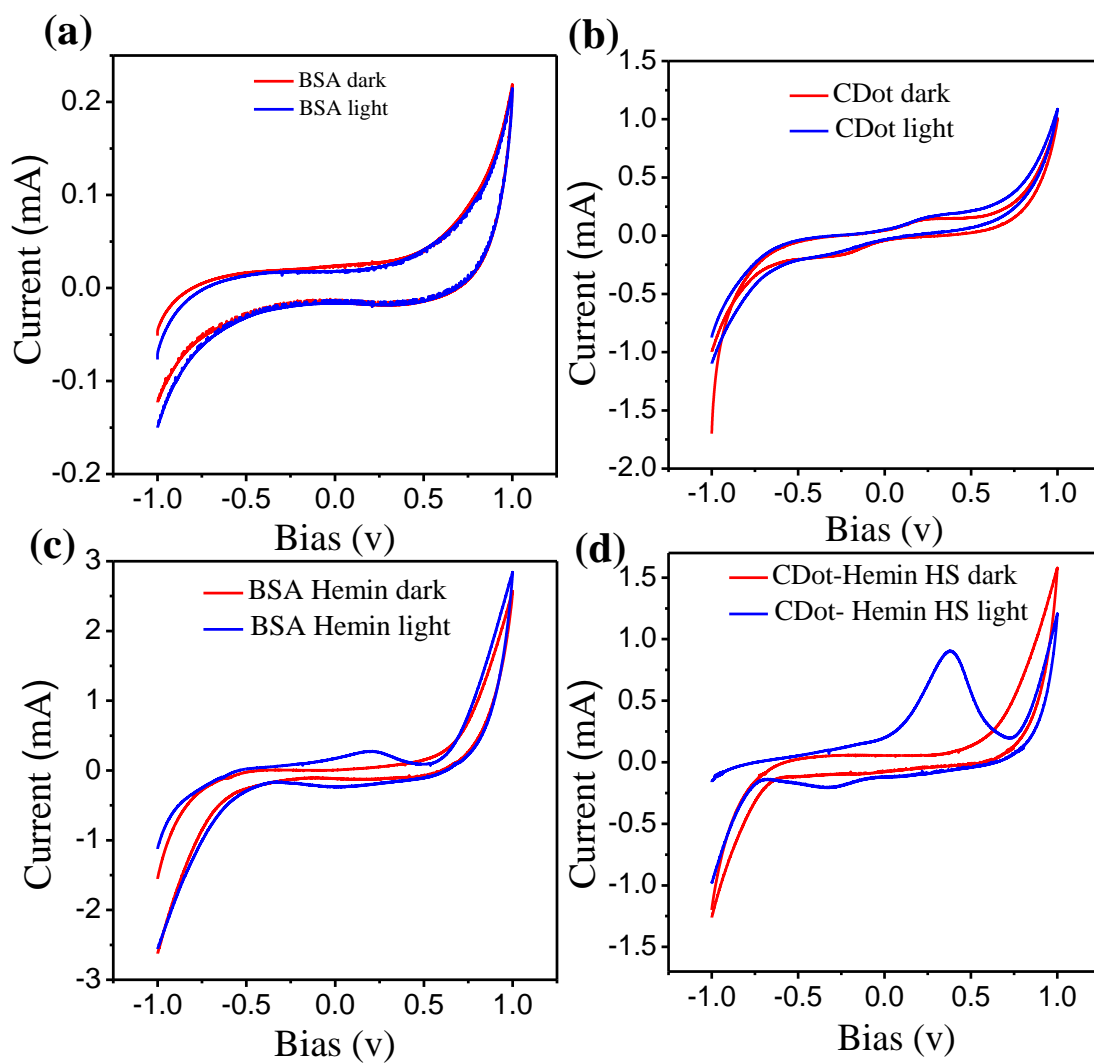


Figure S8: DC current-voltage across (a) nondoped (b) C-Dot (c) Hemin ((d) C-Dot-Hemin HS doped BSA mats measured with Au electrodes.

Table S1: Multi-exponential fitting of the kinetics at 455, 555 and 625 nm of doped C-Dots after excitation at 400 nm.

455 nm				
Sample	τ_{1g} (a_{1g} %)	τ_1 (a_1 %)	τ_2 (a_2 %)	τ_3 (a_3 %)
C-Dot-Hemin	6.5 ps (100)	480 ps (78%)	>1 ns (22%)	
555 nm				
Hemin	120 fs (100)	-	1 ps (92%)	200 ps (8%)
C-Dot-Hemin	<100 fs (100)	350 fs (54%)	3.5 ps (40%)	180 ps (6%)
625 nm				
Hemin	520 fs (100)	-	3 ps (93%)	200 ps (7%)
C-Dot-Hemin	350 fs (100)	1.5 ps (44%)	7.5 ps (50%)	180 ps (6%)