Supporting Information

Singlet Exciton Delocalization in Gold Nanoparticle-Tethered Poly(3-hexylthiophene) Nanofibers with Enhanced Intrachain Ordering

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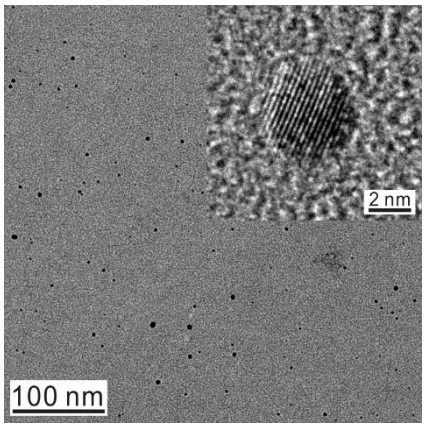

Figure S1. TEM and HRTEM (inset) images of P3HT-Au NPs.

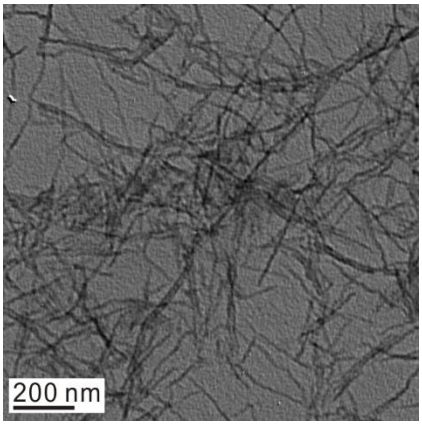

Figure S2. TEM image of pristine P3HT NFs self-assembled in CHN.

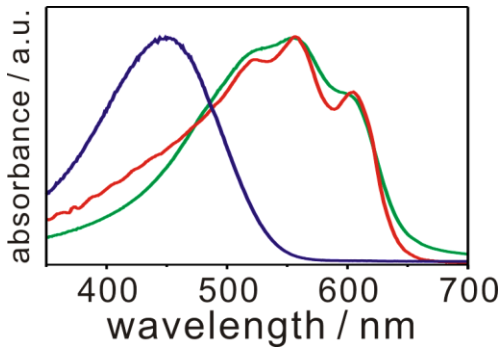

Figure S3. Absorption spectra of non-aggregate RR-P3HT in CF (blue), RR-P3HT film spin-coated on a quartz plate from CF (green), and hybrid P3HT NFs in a mixed solvent of THF and CF (red).

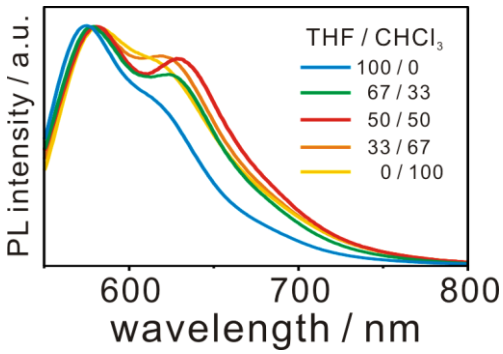

Figure S4. PL spectra of P3HT-Au NPs in mixed solvents of indicated volume ratios with respect to THF and CF. Samples were excited at 530 nm.

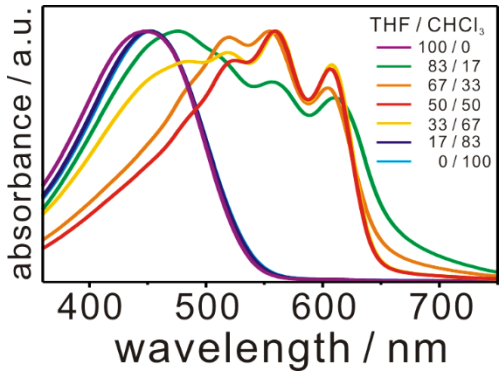

Figure S5. Absorption spectra of RR-P3HT in mixed solvents of indicated volume ratios with respect to THF and CF.

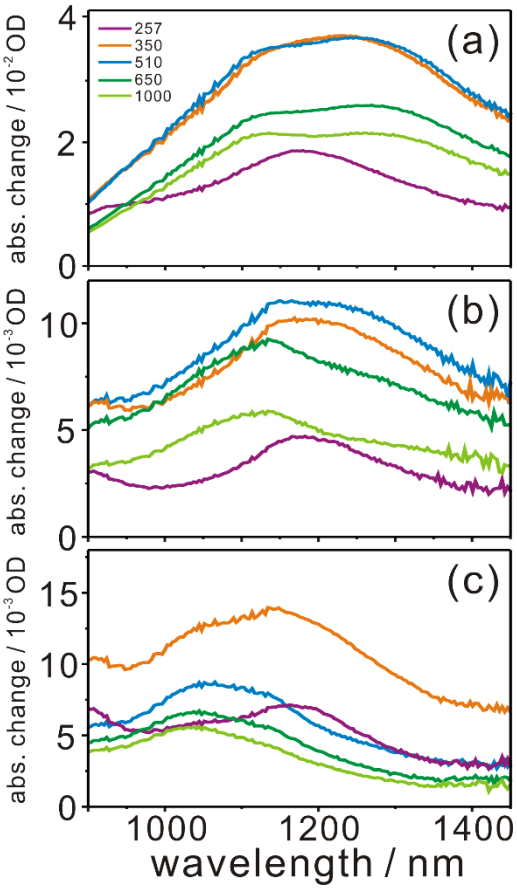

Figure S6. Transient absorption spectra, excited at 530 nm, of (a) pristine P3HT NFs in CHN, (b) hybrid P3HT NFs in CHN, and (c) hybrid P3HT NFs in a mixed solvent of THF and CF. Time delays after excitation are indicated inside in units of femtoseconds.

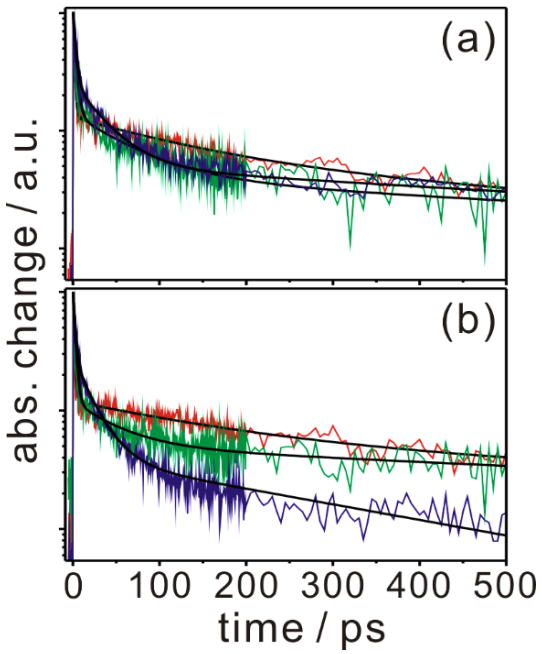

Figure S7. Transient absorption kinetic profiles of pristine P3HT NFs in CHN (blue), hybrid P3HT NFs in CHN (green), and hybrid P3HT NFs in a mixed solvent of THF and CF (red). The transient absorption kinetic profiles of NFs in (a) and (b) represent the localized polaron and singlet exciton decays, respectively. Black lines are the best-fitted curves to extract decay constants.

Table S1. Transient Absorption Decay Constants of NFs in CHN and a Mixed Solvent of THF and CF with Excitation at 530 nm

sample	λ_{pr} (nm)	decay time (ps)
pristine P3HT NFs in CHN	1100	3.0 (74%) + 35 (21%) + 1000 (5%)
	1300	2.3 (72%) + 22 (24%) + 330 (4%)
hybrid P3HT NFs in CHN	1050	3.0 (86%) + 65 (10%) + 1100 (4%)
	1150	2.5 (88%) + 50 (7%) + 1300 (5%)
hybrid P3HT NFs in THF/CF	990	1.5 (87%) + 140 (8%) + 1000 (5%)
	1150	1.5 (88%) + 180 (7%) + 1500 (5%)

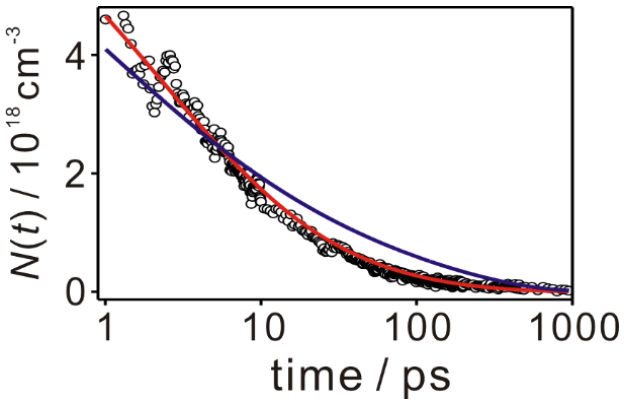

Figure S8. Singlet exciton decay of pristine P3HT NFs in CHN (black circles) pumped at 532 nm and probed at 1300 nm. The solid lines represent the fitting curves with the 3D (red) and 1D (blue) exciton diffusion models.

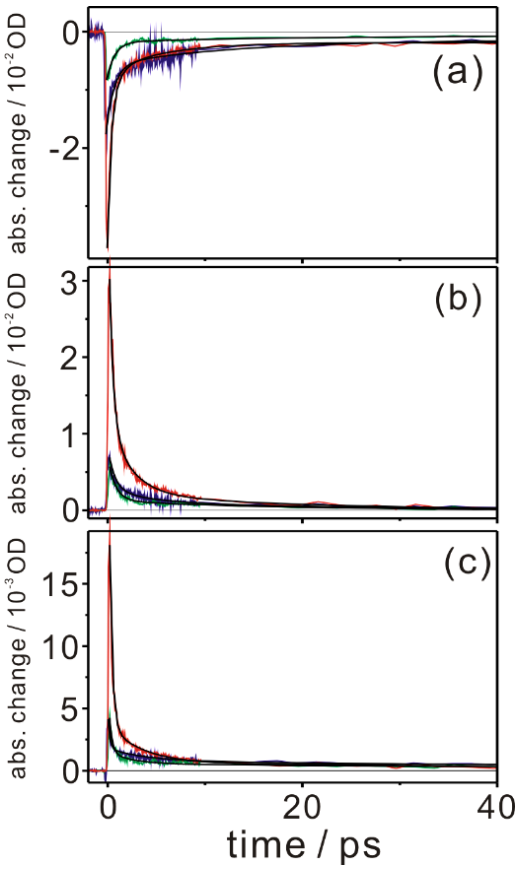

Figure S9. Transient absorption kinetic profiles of pristine P3HT NFs in CHN (blue), hybrid P3HT NFs in CHN (green), and hybrid P3HT NFs in a mixed solvent of THF and CF (red) excited at 530 nm probed at 610 (a), 660 (b), and 740 nm (c). Black lines are the best-fitted curves to extract kinetic constants.

Table S2. Transient Absorption Kinetic Constants of NFs in CHN and a Mixed Solvent of THF and CF with Excitation at 530 nm

sample	λ_{pr} (nm)	recovery/decay time (ps)
pristine P3HT NFs in CHN	610	0.8 (64%) + 12 (25%) + 180 (11%)
	660	0.7 (62%) + 5 (26%) + 35 (12%)
	740	0.2 (57%) + 3.8 (24%) + 80 (19%)
hybrid P3HT NFs in CHN	610	0.8 (78%) + 18 (13%) + 1000 (8%)
	660	0.7 (77%) + 12 (14%) + 26 (9%)
	740	0.3 (66%) + 2.5 (21%) + 75 (13%)
hybrid P3HT NFs in THF/CF	610	0.6 (83%) + 7.3 (13%) + 1200 (4%)
	660	0.4 (63%) + 2.3 (30%) + 19 (7%)
	740	0.2 (77%) + 3.0 (19%) + 55 (4%)