Electronic Supplementary Material (ESI) for Photochemical & Photobiological Sciences

Supplementary material:

Vectorial photoinduced electron transfer in multicomponent film systems of poly(3-hexylthiophene), porphyrin-fullerene dyad, and perylenetetracarboxidiimide

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Figures:

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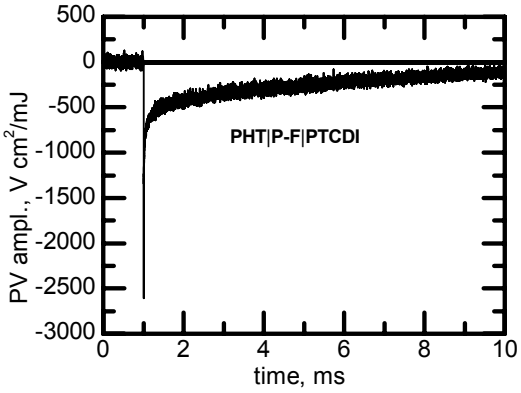


Figure S1. Photovoltage (PV) response in ms timescale for the **PHT|P-F|PTCDI** sample. The excitation wavelength is 532 nm.

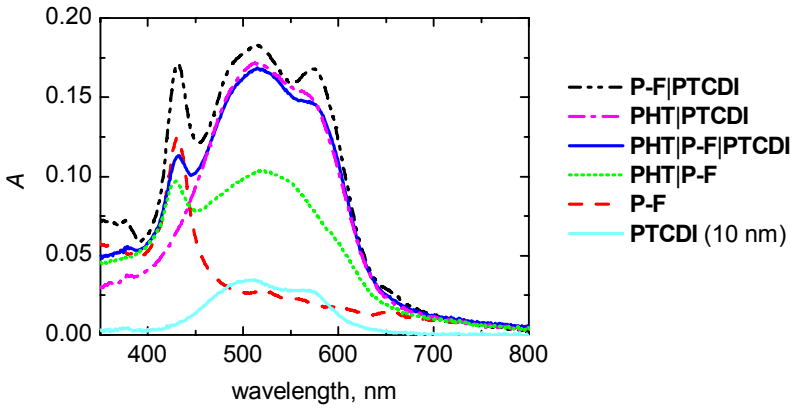
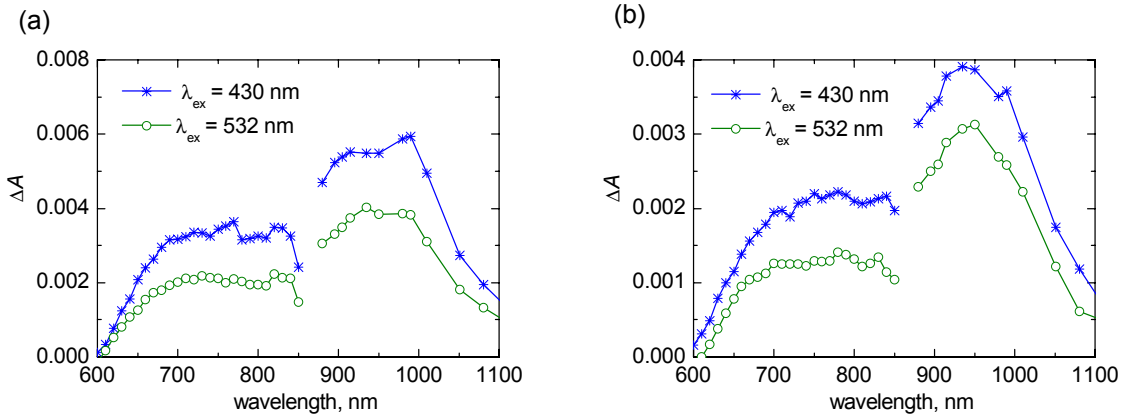


Figure S2. Absorption spectra of film structures studied by the laser flash-photolysis method.



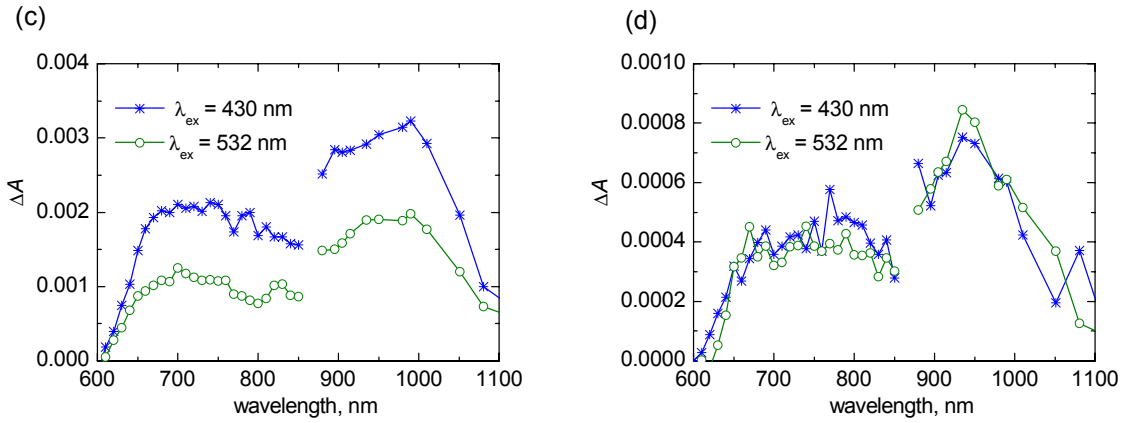


Figure S3. Comparison of the time-resolved absorption spectra at the two excitation wavelengths, 430 and 532 nm for (a) **PHT**|**P-F**|**PTCDI**, (b) **PHT**|**P-F**, (c) **PHT**|**PTCDI**, and (d) **PHT** film structures.

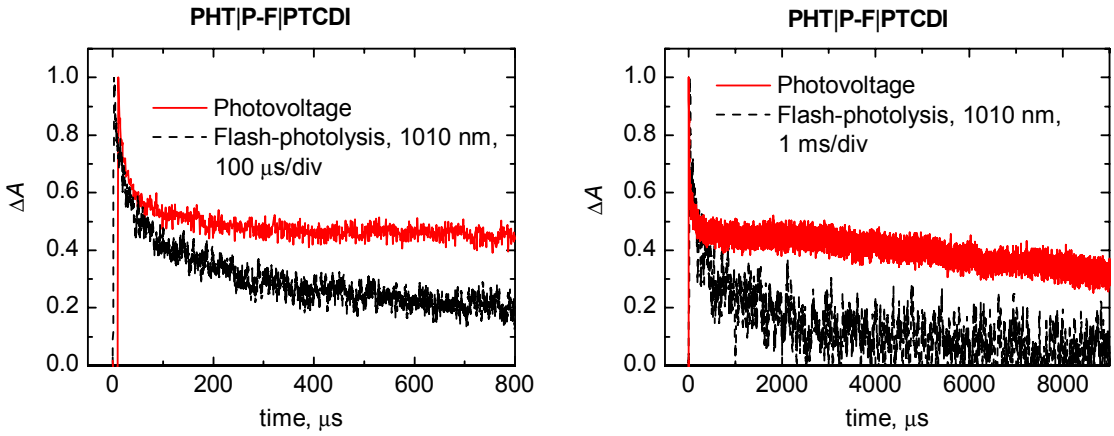


Figure S4. Normalized photovoltage (electrical) and flash-photolysis (optical) signals decays of **PHT**|**P-F**|**PTCDI** structure.

Preliminary studies on photovoltaic devices based on the studied film structures:

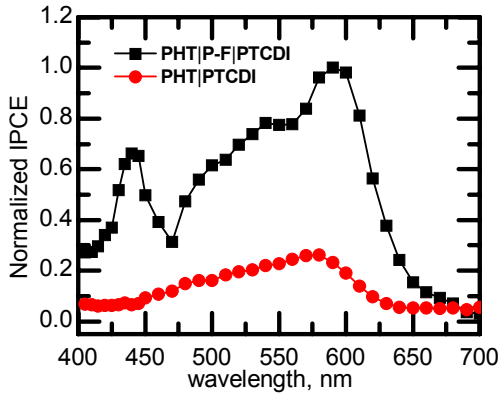


Figure S4. Normalized Incident Phton-to-Current efficiency (IPCE) spectra of **PHT|P-F|PTCDI** and **PHT|PTCDI** structures.

Table S1. Short-circuit current (I_{sc}) from photocurrent measurements, external (Φ_E) and internal (Φ_I) quantum yields at different excitation wavelengths (λ_{exc}). The full sample structure is ITO|active layers|Alq_3|Au.

Active layers	λ_{exc}, nm	I_{sc}, μA/cm^2	Φ_E, %	Φ_I, %
P-F|PTCDI*	430	4.38	3.41	13.0
	510	6.05	4.50	10.7
	580	4.39	5.67	13.1
PTCDI*	430	0.08	0.06	0.4
	510	0.32	0.24	0.6
	580	0.24	0.31	0.7
PHT|P-F|PTCDI	430	3.87	3.79	14.4
	510	8.09	5.63	11.1
	580	8.09	8.64	17.3

PHT|PTCDI	430 510 580	5.08 21.4 18.2	4.32 14.9 19.5	22.3 28.9 38.2

*from Ref [22]

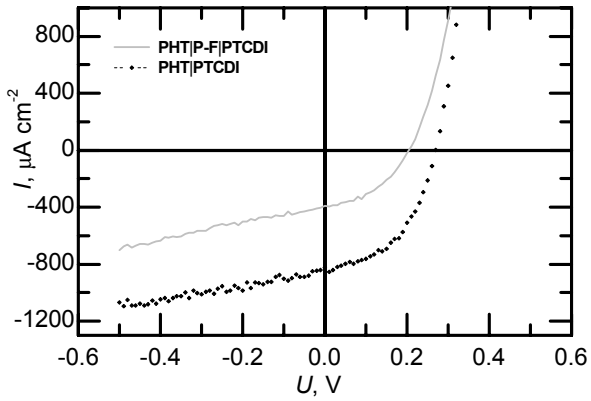


Figure S5. Current (I) –*vs.* voltage (U) characteristics in darkness and under 532 W/m^2 simulated AM 1.5 solar illumination