Supporting Information

Investigation of the Exciton Relaxation Processes in Poly(9,9-dioctylfluorene-co-benzothiadiazole):$CsPbI_{1.5}Br_{1.5}$ Nanocrystal Hybrid Polymer-Perovskite Nanocrystal Blends

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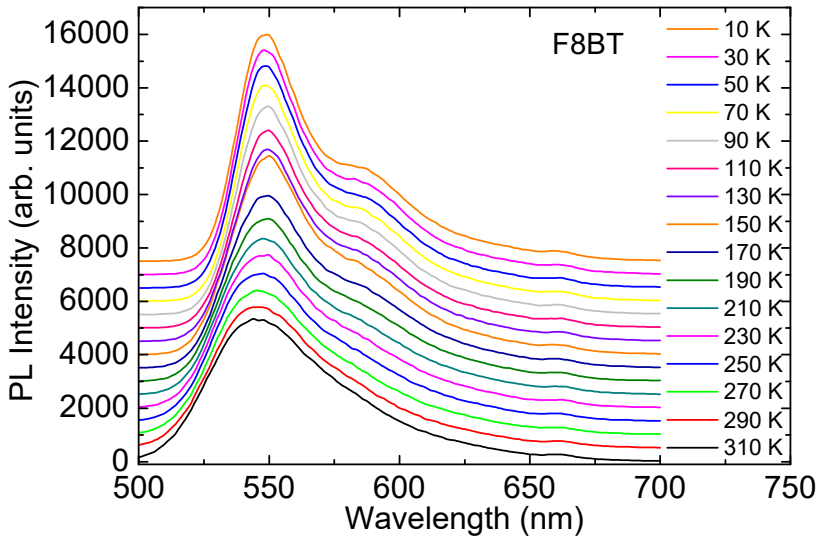

Figure S1: PL spectra of the F8BT sample as a function of the temperature. The spectra are vertically offset for clarity.

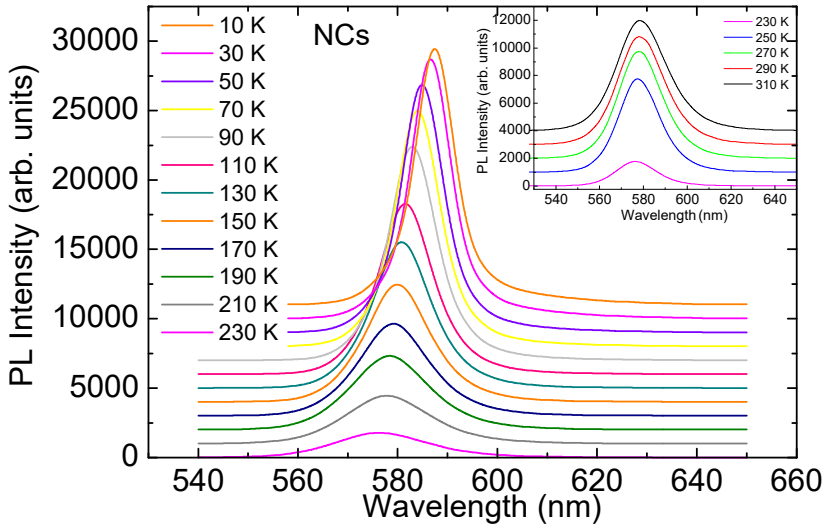

Figure S2: Temperature dependence of the PL spectrum of the NCs film up to 230 K. Inset: PL spectra as a function of the temperature above 230 K. The spectra are vertically offset for clarity.

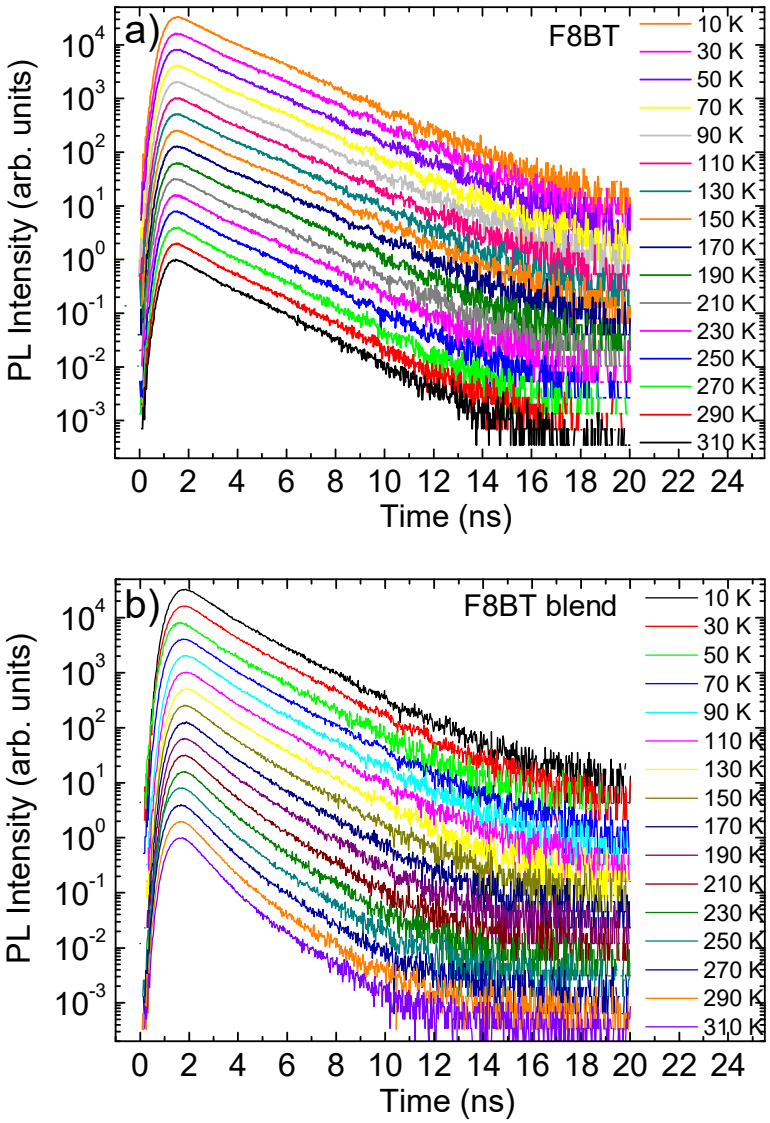

Figure S3: Temperature dependence of the PL relaxation dynamics of the pure F8BT film (a) and the F8BT in the blend (b). The data are vertically scaled for clarity.

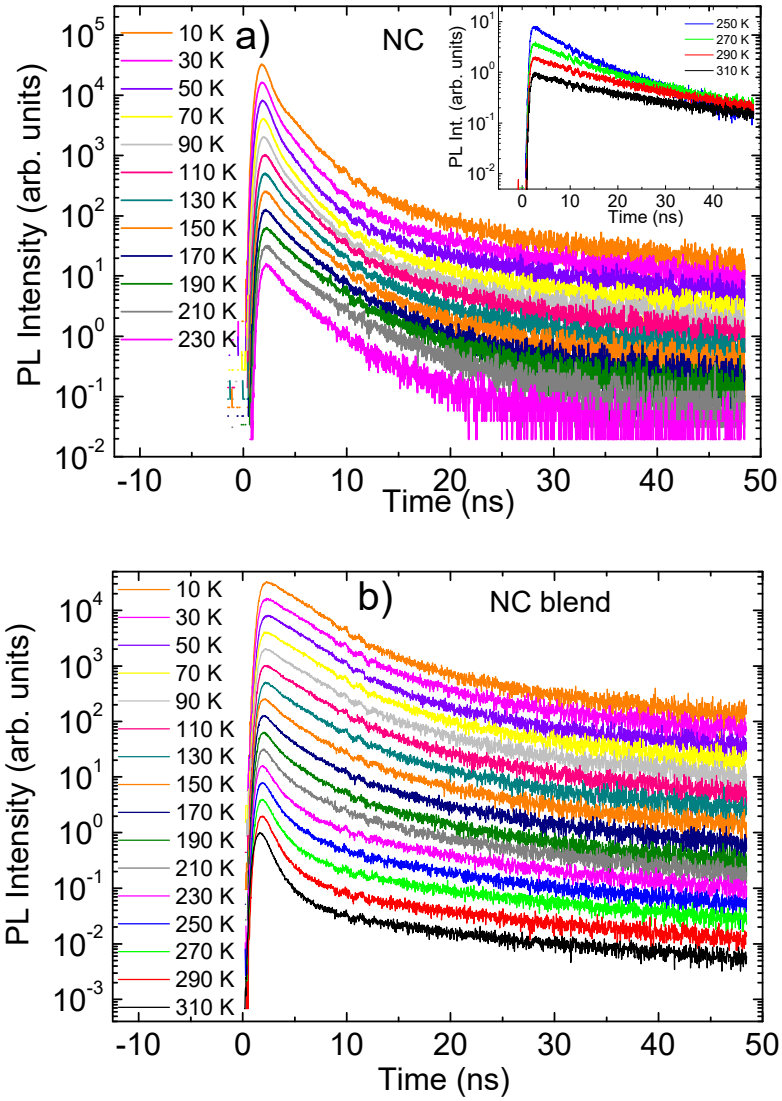

Figure S4: Temperature dependence of the PL relaxation dynamics of the pure NCs film in the range 10 K-230 K (a) with the inset showing the range and 250 K- 310 K, and the NCs in the blend (b). The data are vertically scaled for clarity.

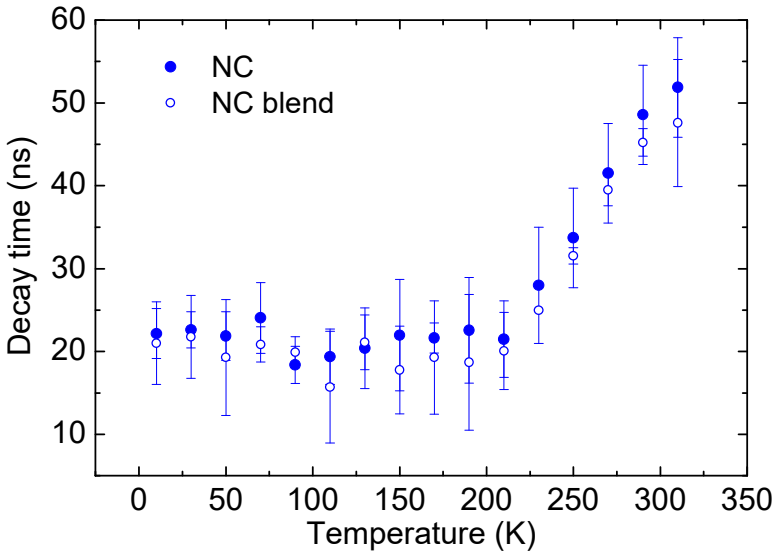

Figure S5: Temperature dependence of the longest decay time of the NCs in pure film (full symbols) and in the blend (empty symbols).

Separation of the F8BT and NC PL intensity in the blend

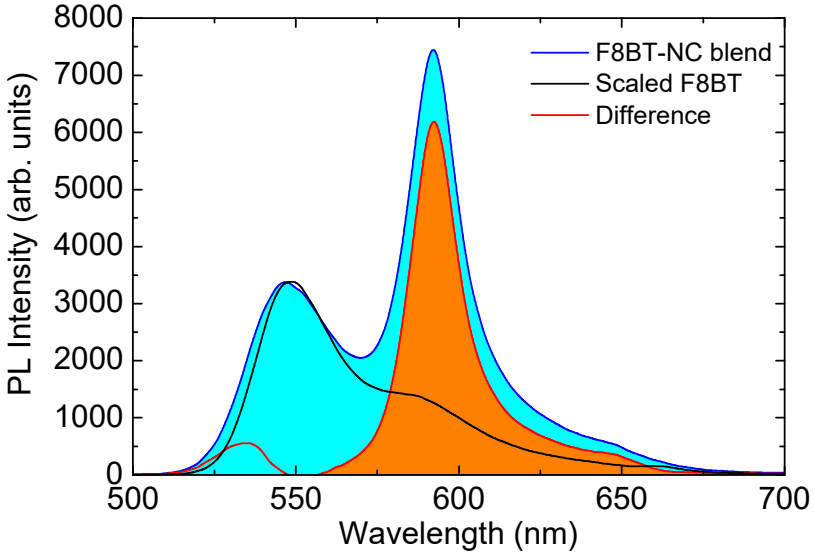

Figure S6: PL spectrum of the blend at T=10 K (blue line), F8BT scaled spectrum (black line) and difference between the two (red line). The cyan and the orange areas evidence the F8BT and the NCs contribution to the total intensity, respectively.

In order to individually investigate the temperature dependence of the F8BT and the NCs in the blend we exploited the close similarity between the F8BT lineshapes in the F8BT:NC blend and in the pure F8BT film to separate the F8BT and the NCs contribution to the total blend PL intensity.

For any investigated temperature we initially scaled the pure F8BT PL spectrum, in order to match the peak intensity of the F8BT peak in the blend (see Fig. S6). We then subtracted the scaled F8BT spectrum from the blend one. Finally we integrated the spectrum only in the wavelength range of the NCs PL, obtaining the total NC PL intensity. The F8BT integrated intensity has been instead obtained as difference between the blend integrated intensity and the NCs one.

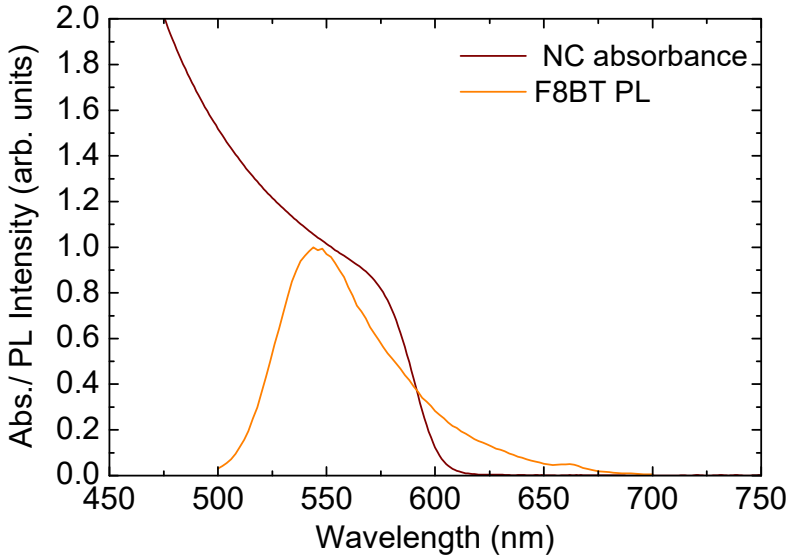

Figure S7: NC absorbance and F8BT PL spectra, evidencing the excellent spectral overlap.

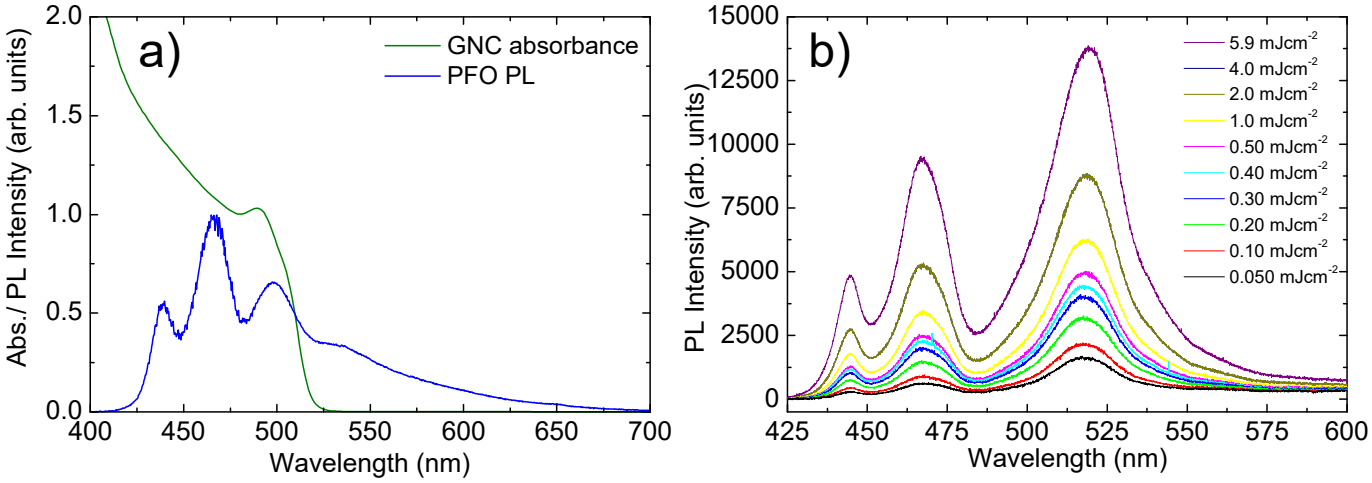

Figure S8: a: GNC absorbance and PFO PL spectra, evidencing the excellent spectral overlap. b: Excitation density dependence of the PL spectra of the PFO:GNC film.