**SUPPLEMENTARY MATERIAL**

**Light triggered modulation of cell antioxidant defense by polymer semiconducting nanoparticles in a model organism**

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**Characterization of P3HT-NP**



**FIG. S1.** Dynamic light scattering of P3HT-NP dispersion in water (top) and optical absorption spectrum (bottom).

**Photoinduced-absorption (PIA) spectroscopy of P3HT-NP**

In this technique, a laser beam resonant with the optical absorption of the material under study perturbs the system and populates molecular excited states; a broad-band probe beam is then used to monitor the changes in the optical transmission of the sample, in the presence and in the absence of optical excitation. The normalized transmittance is expressed as T/T = (Ton – Toff) / Toff , where Ton and Toff refer to the transmission of the sample when optical excitation is on and off, respectively. In particular, a negative signal (T/T < 0) indicates the occurrence of photo-induced absorption processes



**FIG. S2.** Photo-induced absorption spectrum of P3HT NPs dispersed in electrolyte environment. Based on analogy with P3HT solid thin films, the negative T/T signal in the spectral region 900 – 1100 nm is attributed to charged states.