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**Supplementary Information**

# Enzyme-assisted *in-vivo* polymerisation of conjugated oligomer based conductors

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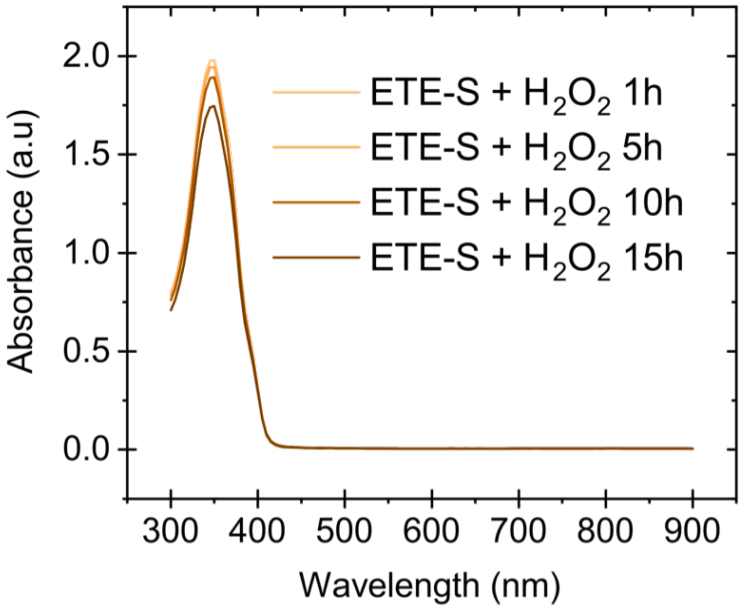


**Figure S1:** UV-Vis absorption spectra of ETE-S (360 µM) with $H_2O_2$ (180 µM) solution in DI water after 1h, 5h,10h and 15hours of reaction. Even after 15 hours of reaction, no polymerization is observed.

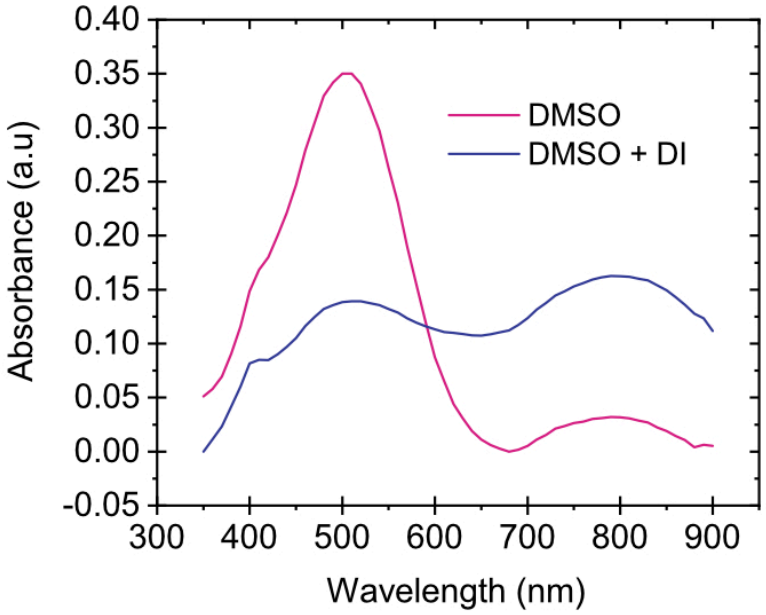


**Figure S2:** UV-Vis absorption spectra of p(ETE-S) formed *in-vitro* with (ETE-S 360µM, $H_2O_2$ 180µM and HRP 100 U/mL) dissolved in DMSO before (red) and after (violet) the addition of DI water (DMSO:DI 1:1 in volume).

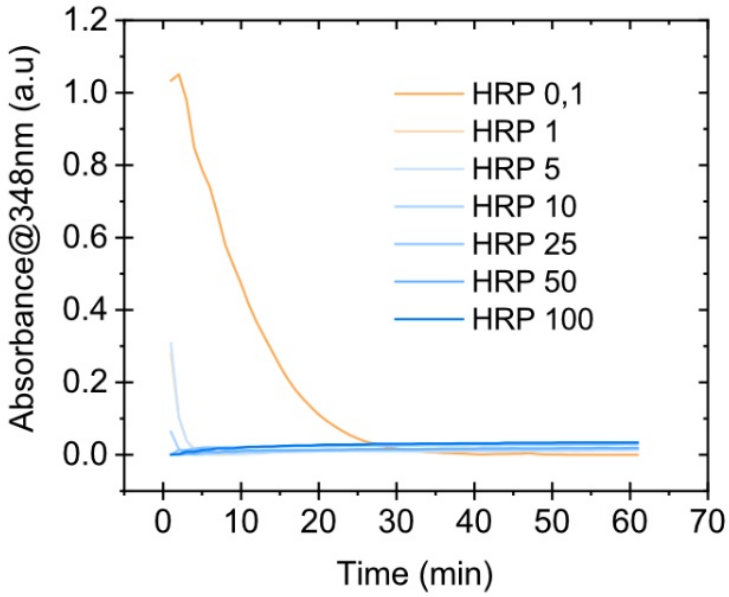


**Figure S3:** a. ETE-S consumption rate, as indicated by monitoring the intensity of the absorbance at 348nm Vs time, for different concentration of HRP [U/ml]. (ETE-S (360 µM) and $H_2O_2$ (180 µM)).

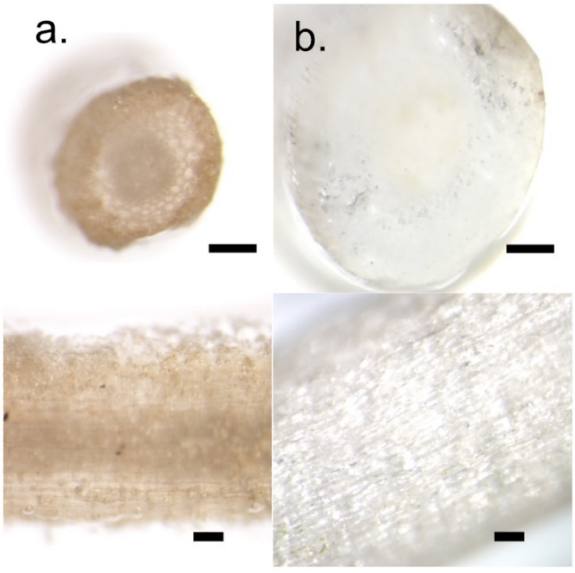


**Figure S4:** Top view and cross section of a. a boiled root + 100 µM $H_2O_2$ after AR staining b. a fresh root without staining. Scalebar represents 100 µm.

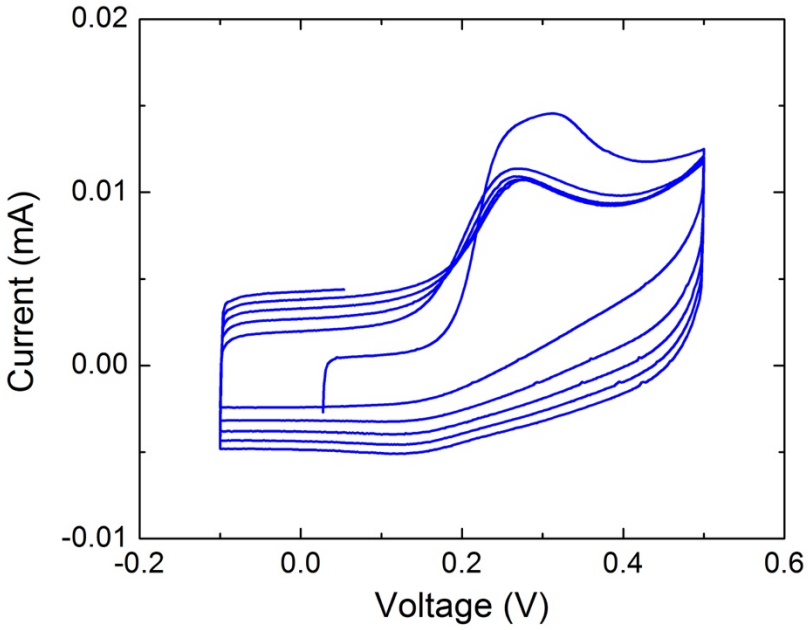


**Figure S5:** Oxidation potential of ETE-S. CV was collected on a flat gold electrode with an Ag/AgCl reference electrode and a Pt counter electrode using a BioLogic SP-300 potentiostat. The solution contained 1 mg/mL ETE-S in 10 mM NaCl supporting electrolyte.