

Supporting Information

Mechanism of the biomolecular synthesis of PEDOT:PSS: Importance of heme degradation by hydrogen peroxide

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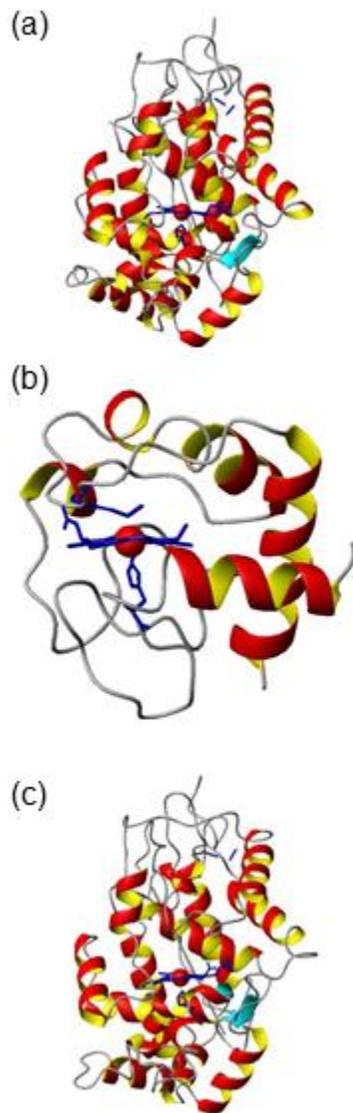


Fig. S1 Graphical representations of (a) SBP (PBID: 1FHF), (b) cyt c (PBID: 1HRC), and (c) HRP (PBID: 1H5D) from the heme protein database.¹ Alpha-helices are red and yellow, beta sheets are light blue, random coils are grey, and heme groups are dark blue. Iron centers are represented by red spheres.

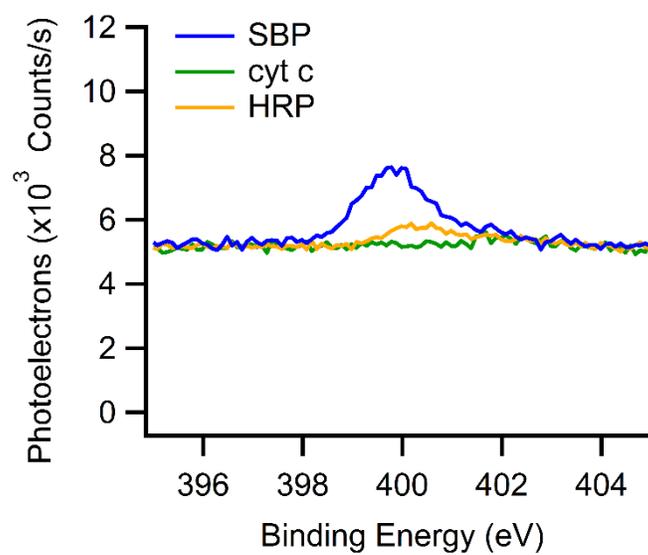


Fig S2 Representative XPS spectra of PEDOT:PSS polymerized by SBP (blue), cyt c (green), and HRP (yellow). The presence of an N1 photoelectron peak at 400 eV suggests protein is present in the PEDOT:PSS films. PEDOT:PSS contains no nitrogen.

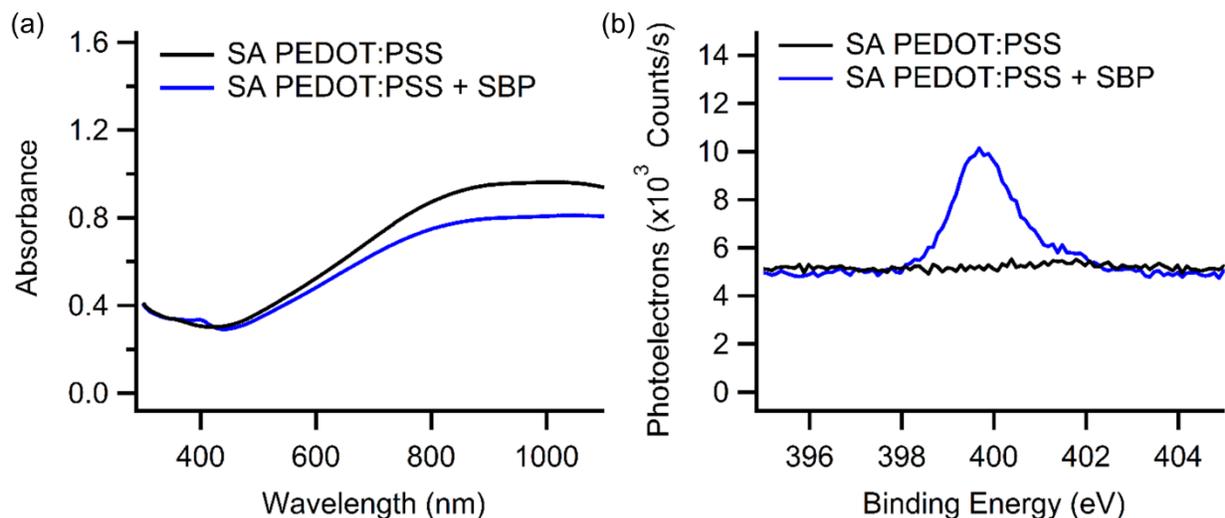


Fig. S3 (a) Visible and near IR spectra of Sigma-Aldrich (SA) PEDOT:PSS with (blue) and without (black) SBP. (b) XPS spectra of SA PEDOT:PSS with (blue) and without (black) SBP. The presence of an N1 photoelectron peak at 400 eV demonstrates that the protein added to SA PEDOT:PSS is incorporated into the film.

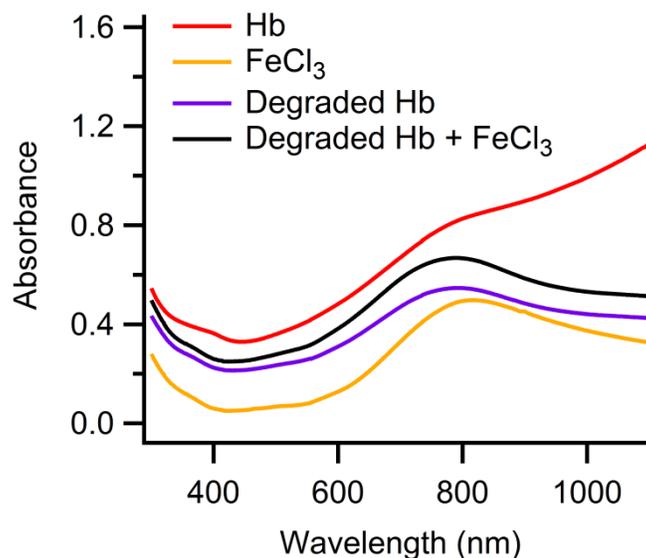


Fig. S4 Visible and near IR spectra of PEDOT:PSS polymerized FeCl₃ (orange), degraded Hb (purple), and both oxidants together (black). Representative visible and near IR spectrum of Hb-polymerized PEDOT:PSS is plotted for comparison.

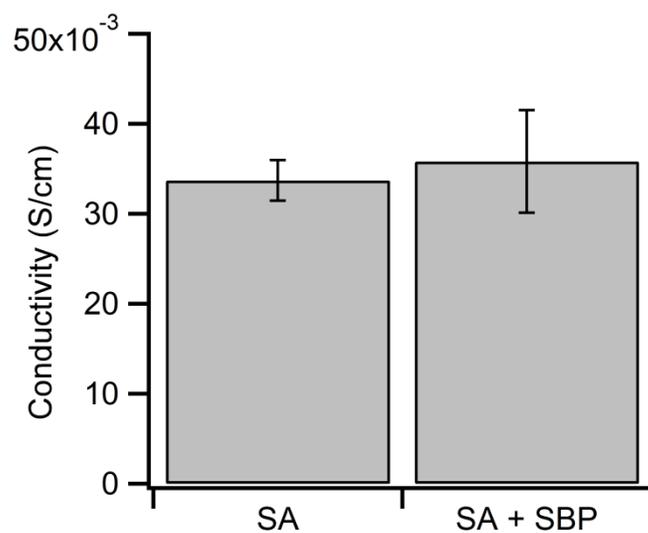


Fig. S5 Four point probe conductivity measurements of low conductivity grade Sigma-Aldrich (SA) PEDOT:PSS (#560596) with and without soybean peroxidase (4.8 μM by heme concentration). Error bars represent the standard deviation of 16 measurements across four films.

References

1. C. J. Reedy, M. M. Elvekrog and B. R. Gibney, *Nucleic Acids Res.*, 2008, **36**, D307-313.