Electronic Supplementary Material (ESI) for Materials Advances.

Supporting Figures

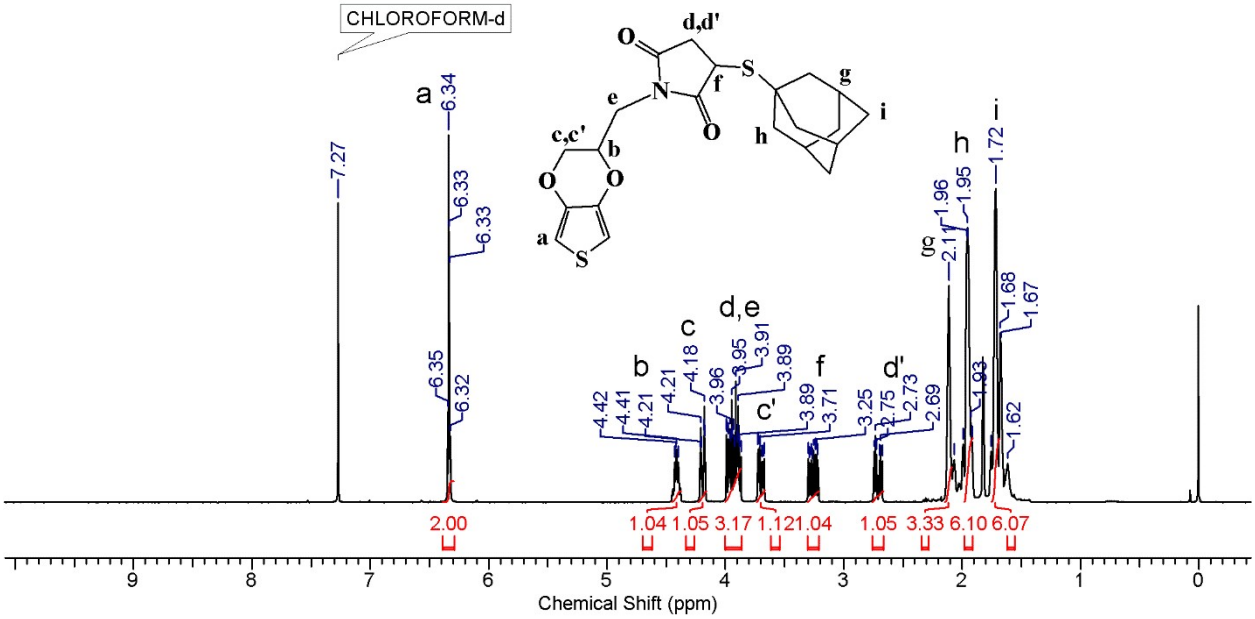

Figure S1 *[1]H-NMR spectrum (in CDCl3) of EDOT-MA-adamantane*

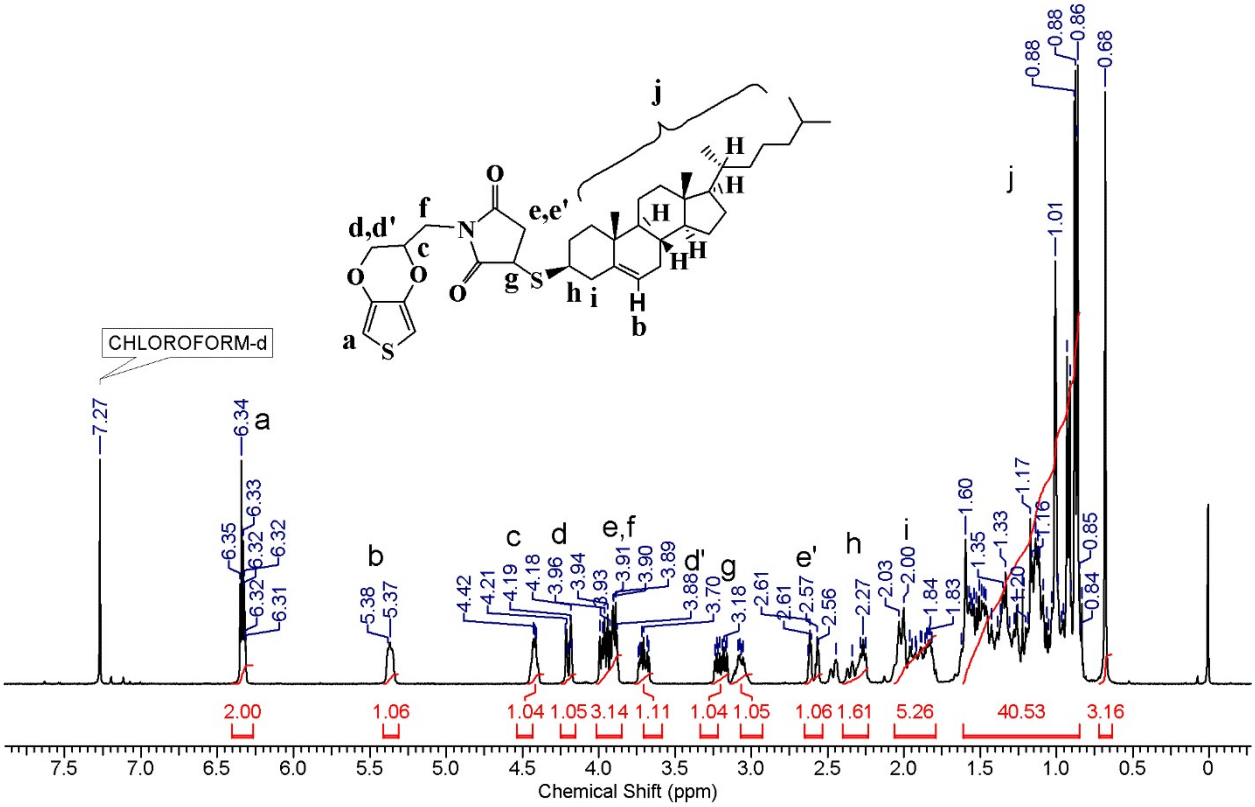

Figure S2 *[1]H-NMR spectrum (in CDCl3) of EDOT-MA-cholesterol*

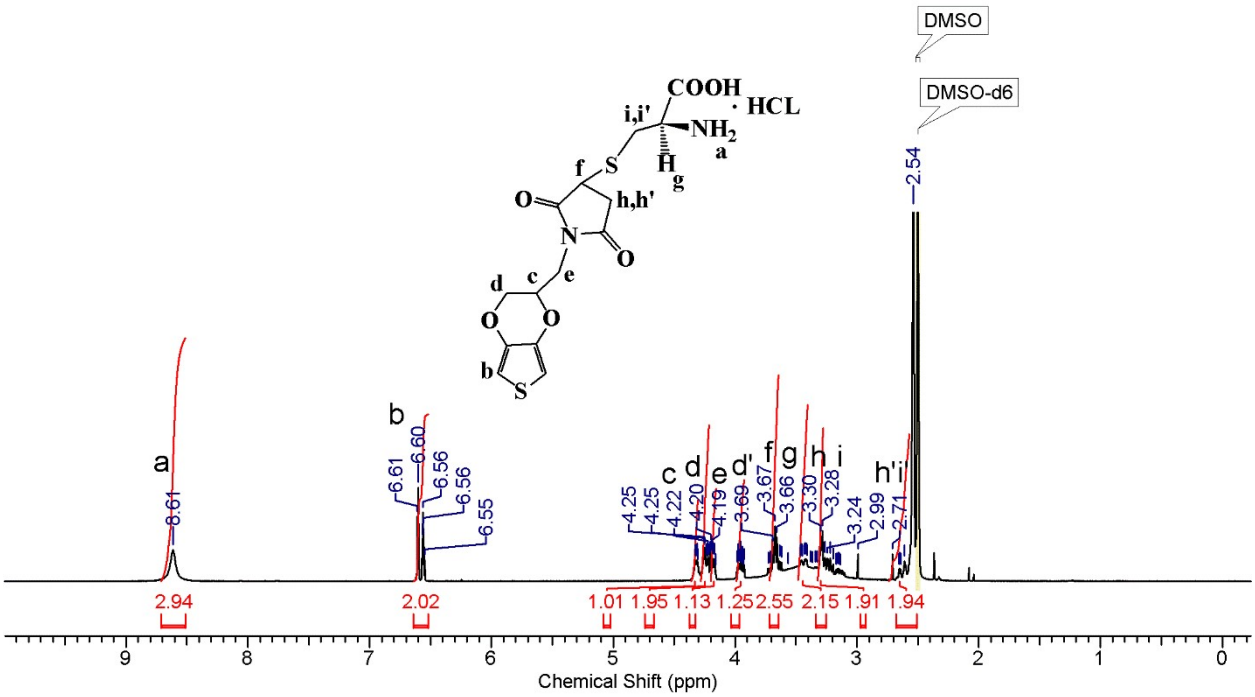

Figure S3 *[1]H-NMR spectrum (in CDCl3) of EDOT-MA-cysteine*

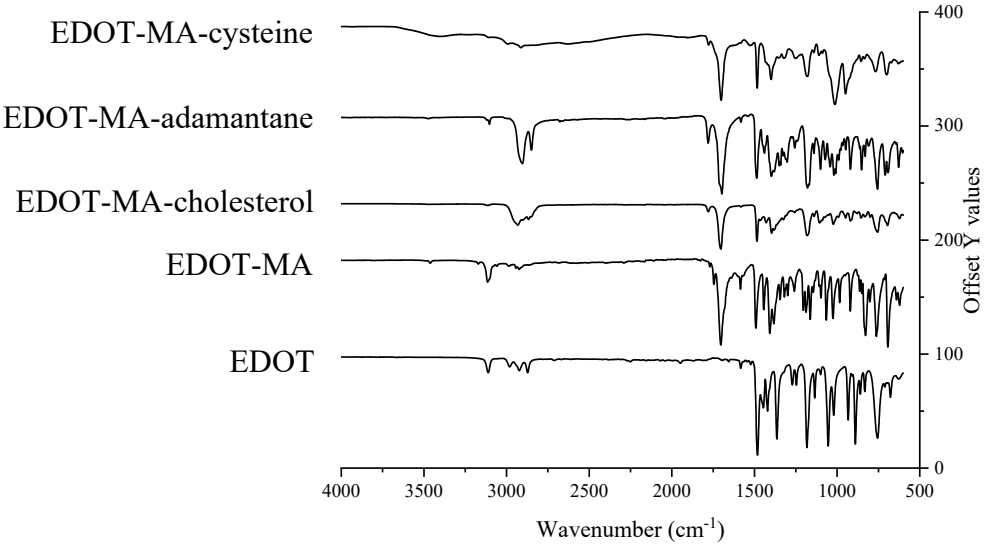

Figure S4 *ATR-FTIR spectra of EDOT and EDOT+ monomers*

ATR-FTIR spectra from 650 to 4000 cm^{-1} for all monomers given. Addition of the maleimide group indicates conjugated carbonyl groups in the maleimide ring at 1706 cm^{-1}. Further functionalization with cholesterol, adamantane, or cysteine also shows a removal of the maleimide carbon double bond at 1585 cm^{-1} that is clicking to thiol. Addition of the cholesterol causes a broad peak at 2932 cm^{-1} from the variety of hydrocarbons. Adamantane has two defined peaks at 2906 cm^{-1} and 2856 cm^{-1} from the simple hydrocarbons that compose adamantane. The broad peak at high wavenumber in cysteine is a function of the hydrogen bonding from the carboxylic acid.

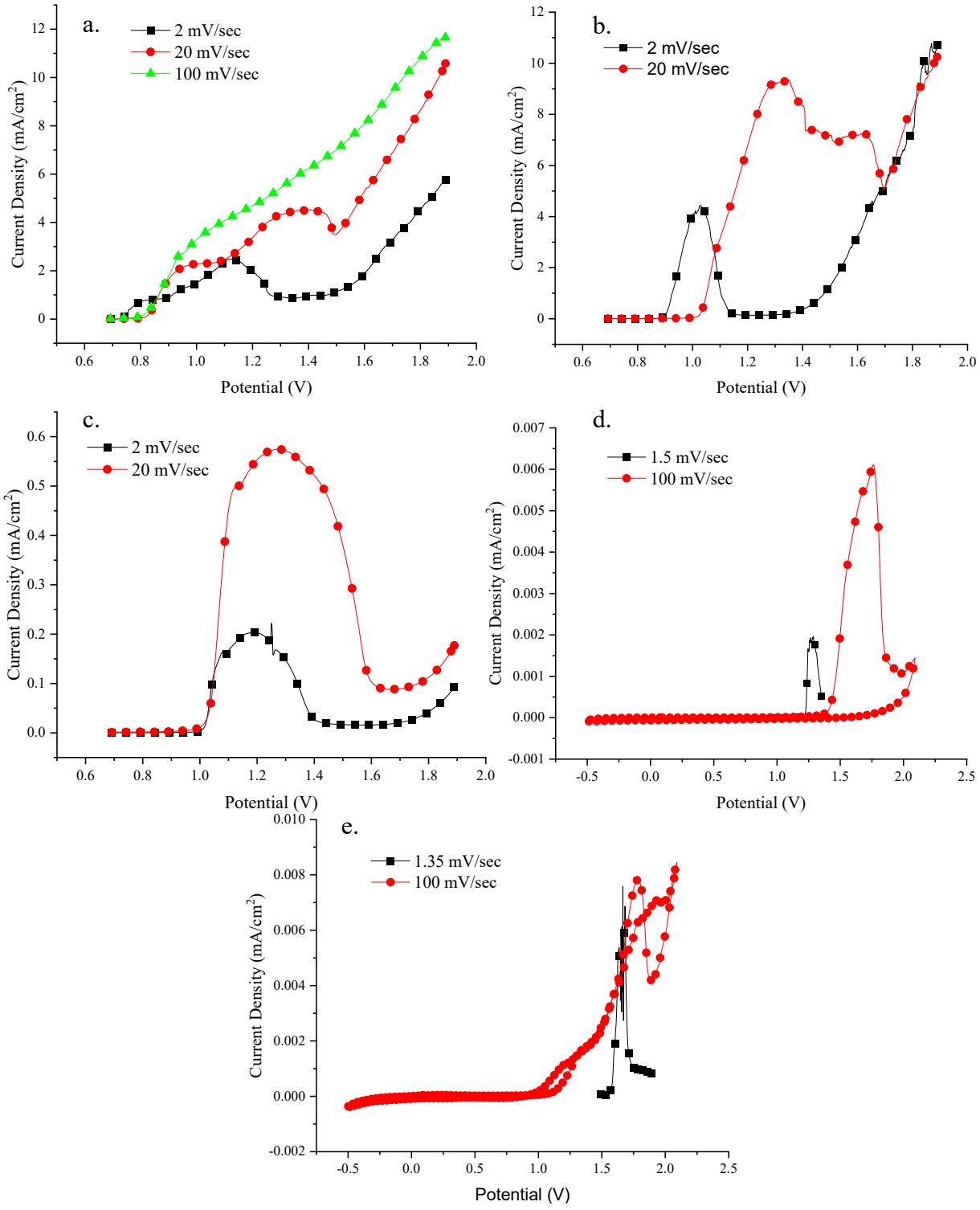

Figure S5 *Variation in scan rate effect on polymerization potential of EDOT-maleimide derivatives a. EDOT b. EDOT-MA, c. EDOT-MA-cholesterol, d. EDOT-MA-adamantane, and e. EDOT-MA-cysteine*

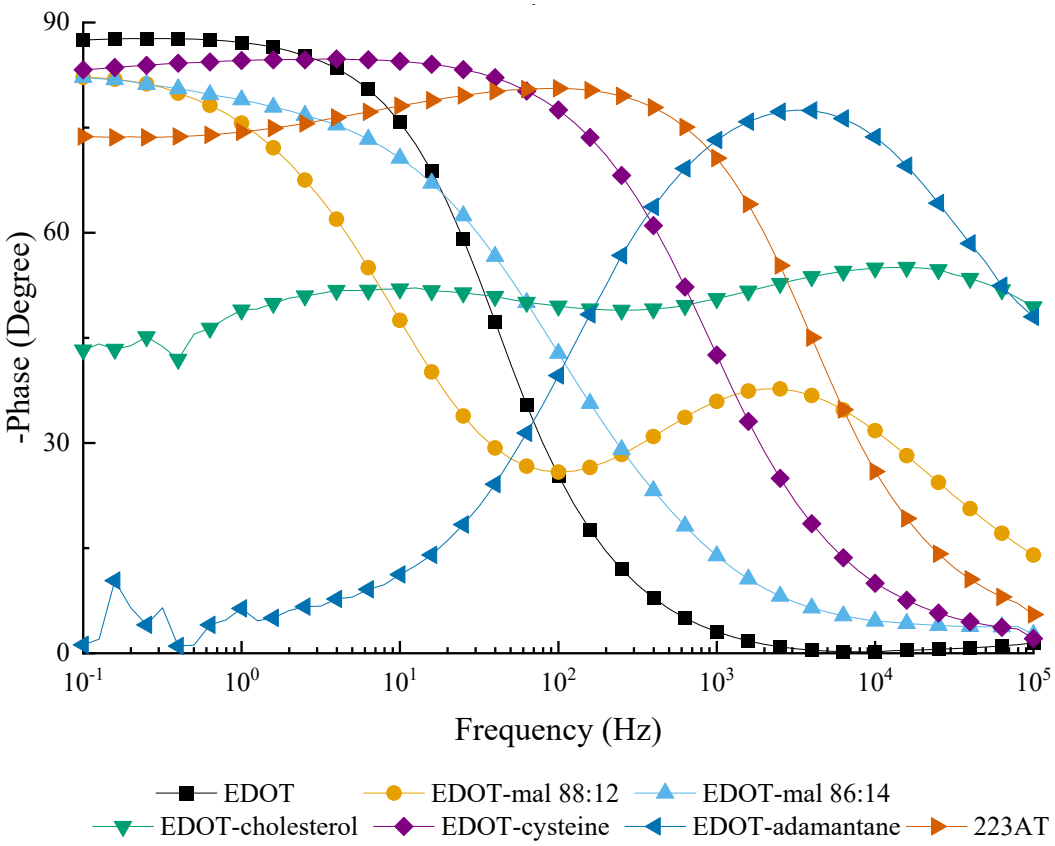

Figure S6 *Bode plot of magnitude for PEDOT+ films on 223AT electrodes*

	1st layer (PEDOT)	2nd layer (PEDOT+)	1st layer (PEDOT+)	2nd layer (PEDOT)
EDOT-MA	3.4 s	12 s	11.7 s	2.8 s
EDOT-MA-cholesterol	3.8 s	70 s	118 s	9.2 s
EDOT-MA-adamantane	3.5 s	18.8 s	30.8 s	4.3 s
EDOT-MA-cysteine	4.5 s	7.5 s	19.5 s	4 s

Table S1 *Comparison of depositions times for stacked copolymerization of EDOT and EDOT+*

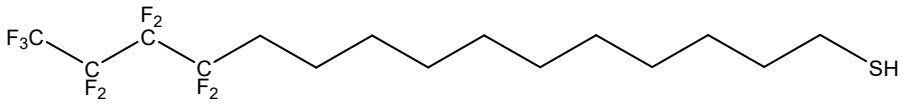

Figure S7 *molecular structure of 12,12,13,13,14,14,15,15,15,-Nonafluoropentadecane-1-thiol*

	Post-process-1	Post-process-2	Post-process-3	Blank test
Before	33°	22°	37°	5°
After	103°	130°	123°	15°

Table S2 *Contact angles of PEDOT-MA before and after post-process in comparison to blank test*

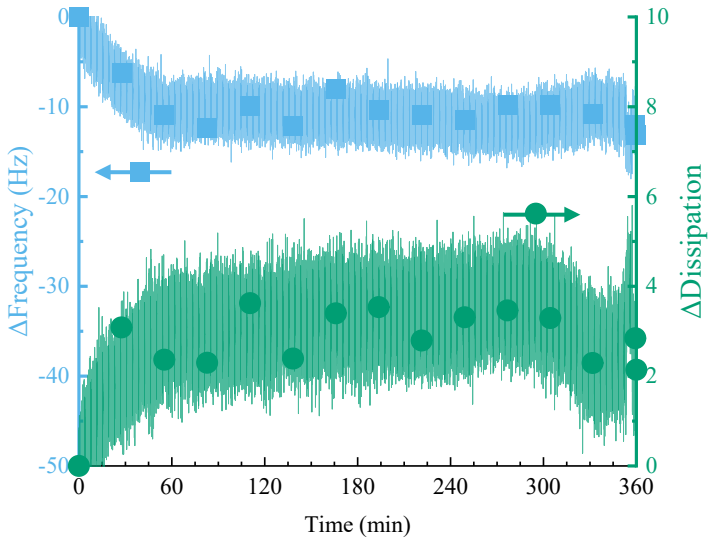

Figure S8 *Change in frequency and dissipation during of PEDOT-maleimide with triethylamine*

Additional Post-processing of PEDOT-MA Films

EDOT-MA polymerization was performed on a coated indium tin oxide (ITO) glass substrate using the above described procedure. A potentiostatic method was used instead of a galvanostatic method to deposit the film. The dried-out PEDOT-MA coated ITO was reacted with 14.1 µg/mL green fluorescent protein (GFP) in 0.1 M triethylamine for 12 hours. Excess GFP was removed by rinsing four times with DI water.

Post processing of PEDOT-MA films with GFP led to films that showed limited fluorescence at exposure times of 20 – 40 seconds, Figure S9. PEDOT-MA that was not exposed to GFP showed no fluorescence at any exposure times. Limited emission is likely due to the broad absorption of PEDOT and its derivatives that blocks both excitation and emission of GFP that is not close to or directly on the surface of the film. Additionally, the morphology of the films was inconsistent which led to varied responses over the entire surface of the films that showed fluorescence.

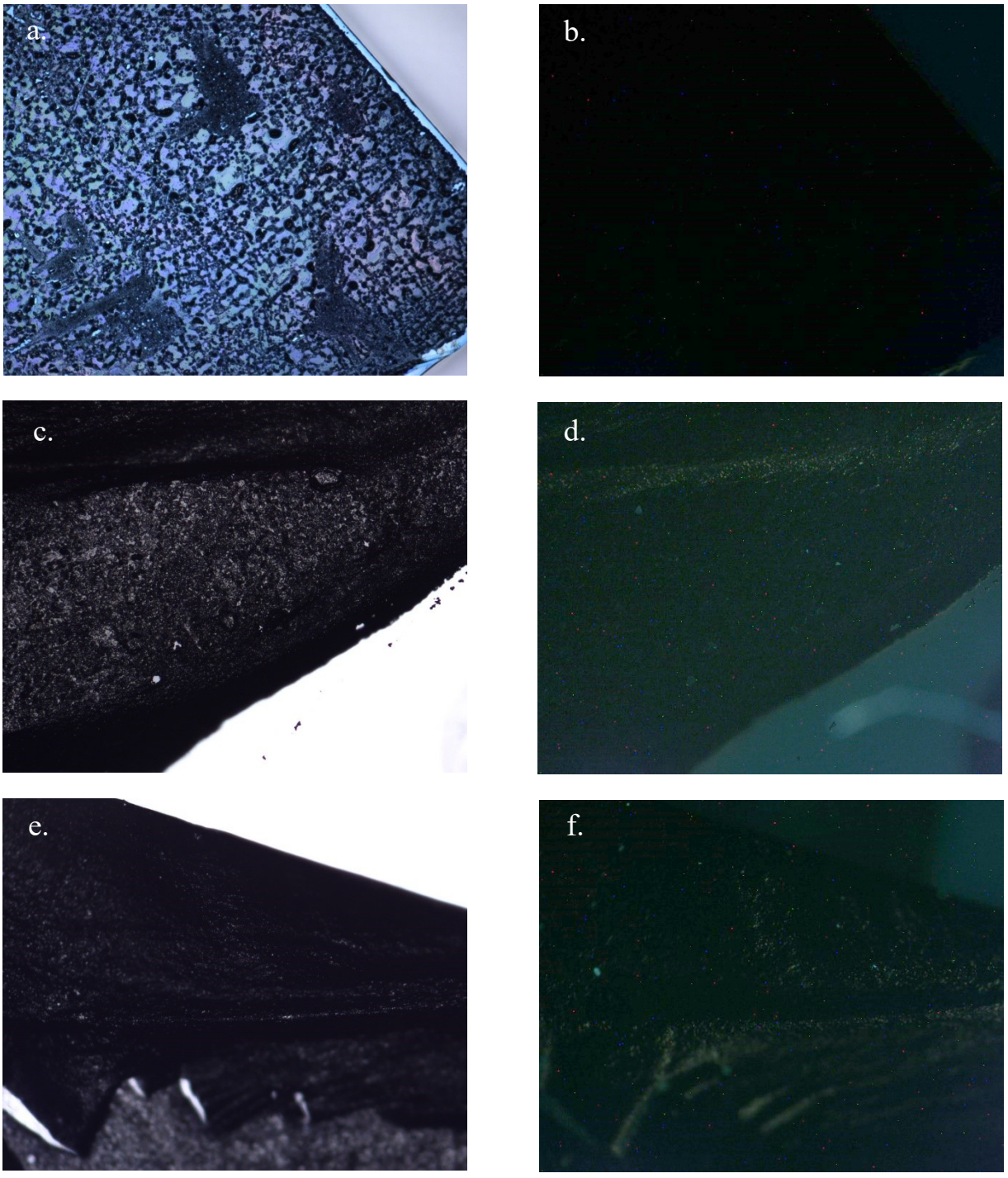

Figure S9 *Optical bright field (a, c, e) and fluorescent (b, d, f) images of a. and b. untreated PEDOT-MA c and e. GFP treated PEDOT-MA d. GFP treated PEDOT-MA for 20 second exposure time and f. GFP treated PEDOT-MA for 40 second exposure time*

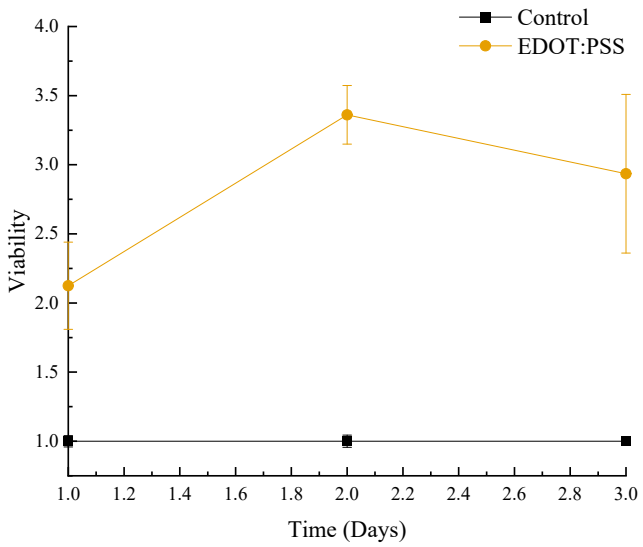

Figure S10 *Cytocompatibility of 0.01 M EDOT with 0.02 M PSS*