Supporting Information

Characterizing Surface Functional Group Density for O_2 Plasma and UV/O_3-Activated Thermoplastics Using Super-Resolution Microscopy

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Table S1: COMSOL parameters used for fluid modeling.

Parameter	Uniform Channel	5 min UV/O_3
Diffusivity of Hydrogen	9.31×10^{-9} m^2/s	
Diffusivity of Chlorine	2.03×10^{-9} m^2/s	
Mobility of Hydrogen	3.76×10^{-12} s*mol/kg	
Mobility of Chlorine	8.19×10^{-13} s*mol/kg	
Initial Concentration of Hydrogen	2×10^{-3} M	
Electric Field	50 V/cm	
Debye Length	$6.87 \times 10 \times 10^{-9}$ m	
Initial Concentration of Chlorine	2×10^{-3} M	
Channel Dimensions	50 x 50 x 500 nm	50 x 50 x 1000 nm
Surface Charge Density	-1.2×10^{-3} C/m^2	-1×10^{-12} C/m^2
-COOH Point Charge	-	-1.27 C/m^2

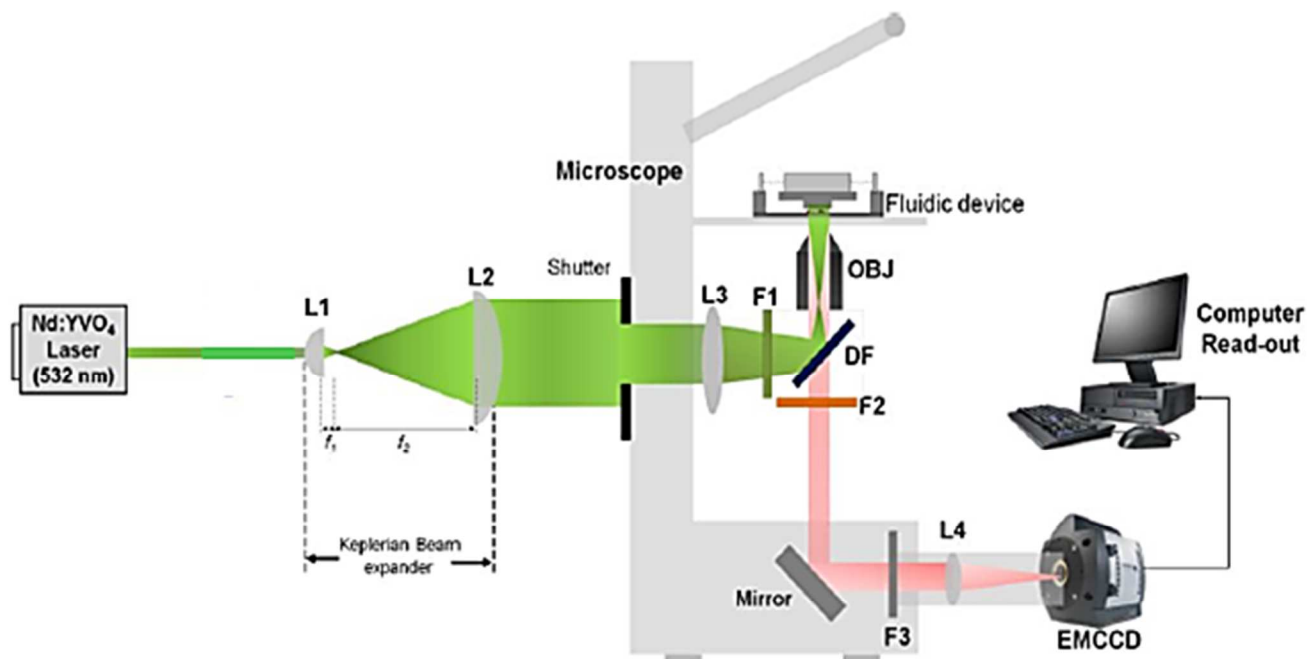**Figure S1.** Optical set-up of the fluorescence imaging system. The Gaussian beam from the Laser (Nd:VYAG (λ_{ex} = 532 nm; P = 0.01-5 W; 2.2 mm beam diameter) was expanded 10 times with a Keplerian beam expander (focal lengths were 20 mm and 200 mm for L1 and L2 plano-convex lenses, respectively) and the wings were knocked out with a beam iris that ensured uniform laser intensity in the field-of-view and complete back-filling of the objective (OBJ). The beam was focused through an iris into the back of a 100x oil immersion objective lens (OBJ) using lens (L3) after passing through a 532 nm laser line filter (F1) and being reflected by a dichroic filter (DF). A collimated laser beam impinged upon the polymer nanofluidic device. The fluorescence signal generated from the single fluorescent entities were collected by this same objective, passed through the DF and spectrally selected using a long pass filter (F2). A mirror was used to steer the fluorescence signal onto the EMCCD after passing through a band-pass filter (F3) and focused using a lens (L4).
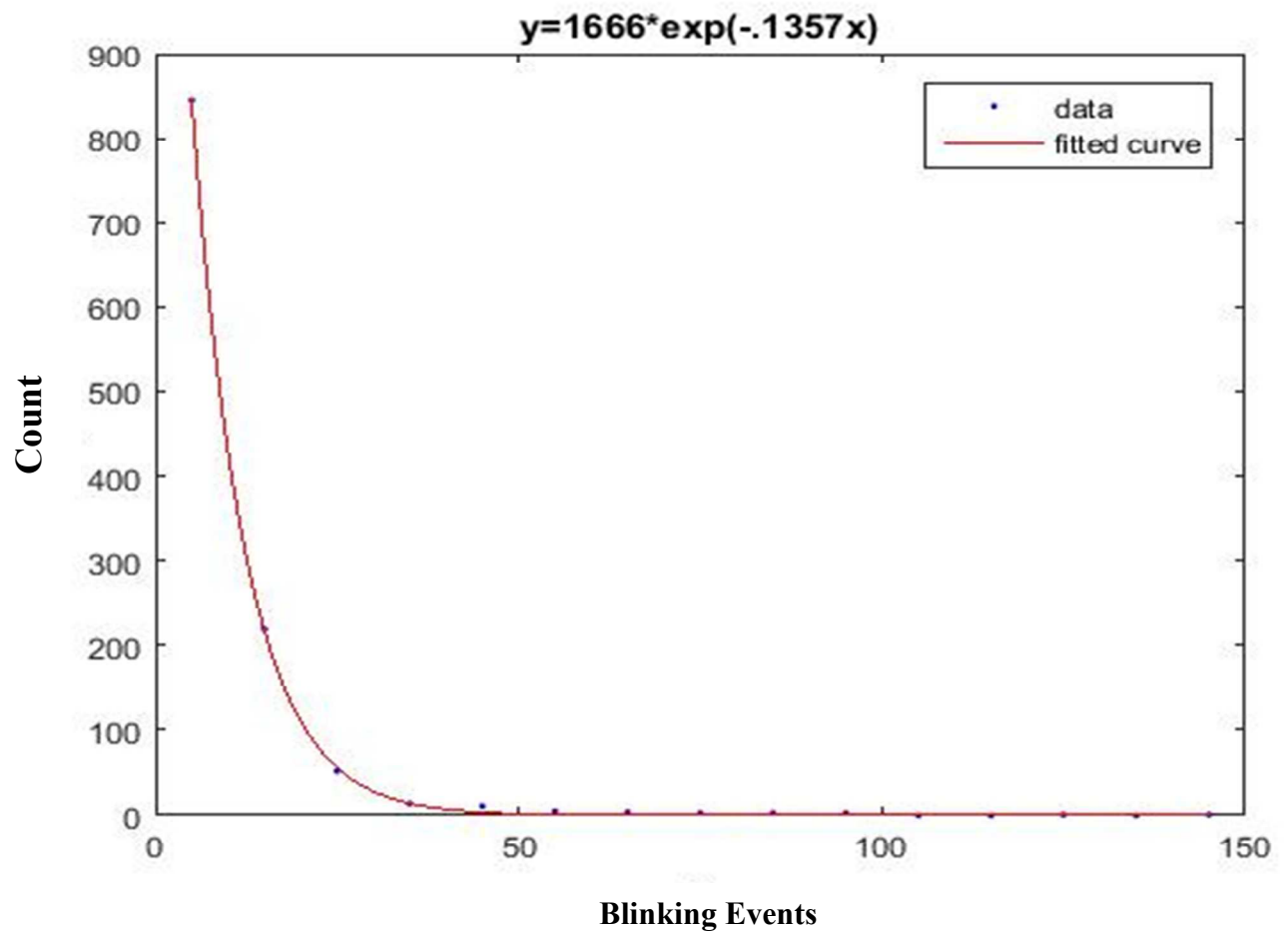
Figure S2. MATLAB exponential fitting of the number of blinking events versus counts. Equation of this line was $y=1666*\exp^{-.1357x}$ which shows an average number of blinking events to be 7.
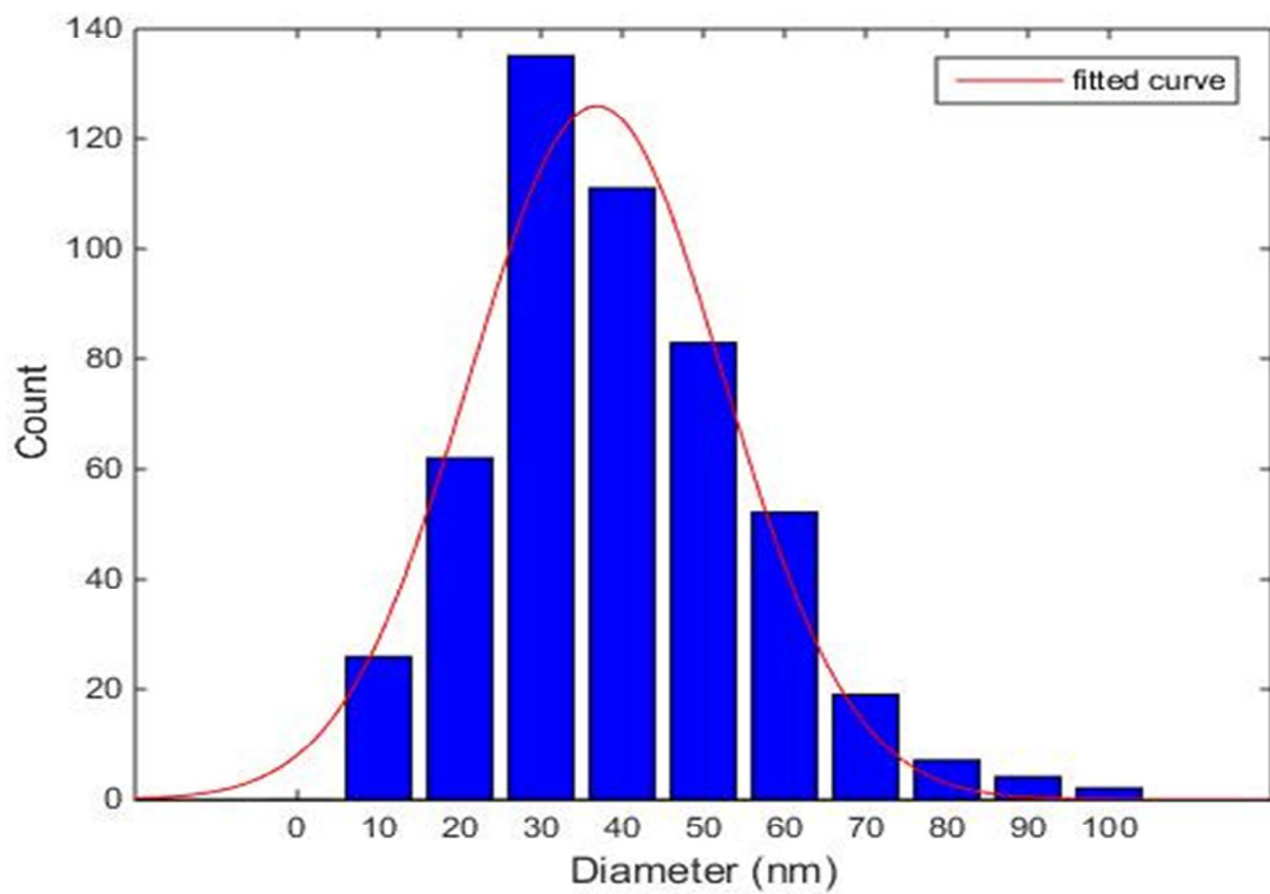
Figure S3. Representative Gaussian fit of clustered STORM data to determine the FWHM.
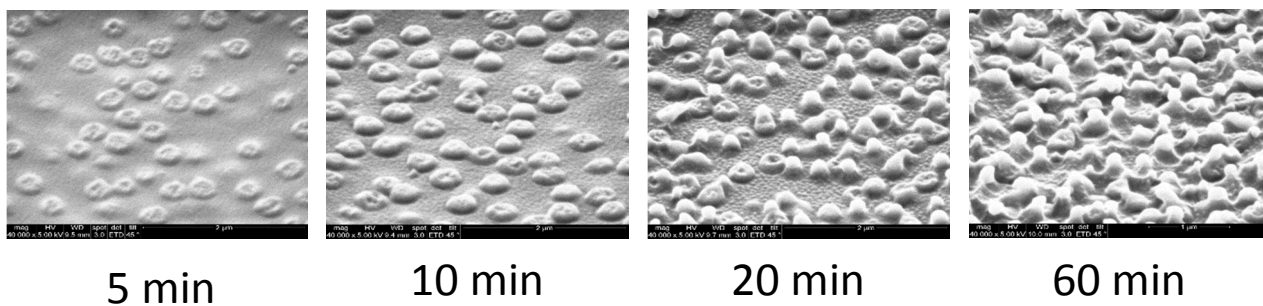
5 min   10 min   20 min   60 min

Figure S4. SEM Images of PMMA exposed to varying doses of O_2 plasma showing the presence of impact modifier (butylacrylate) additives.