Supplementary information

Long-Term Digital Microfluidic Chips for Regulating Macrophage Cellular Interactions in Inflammation

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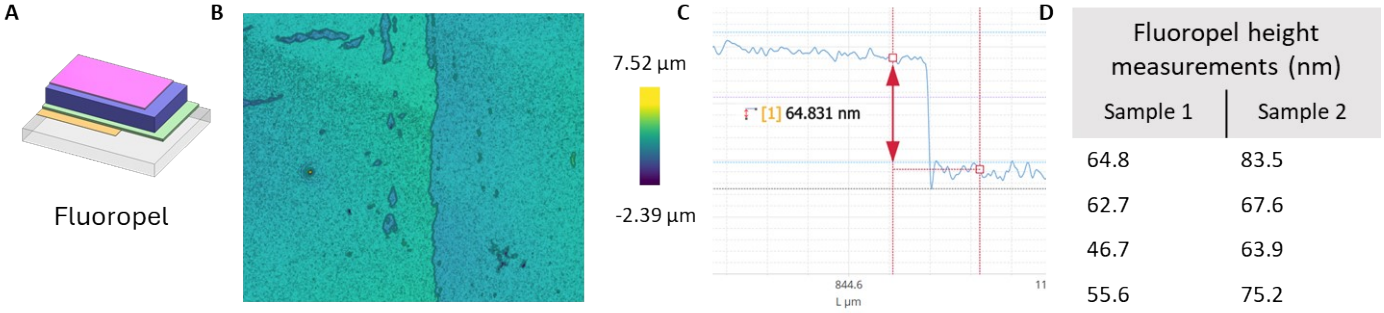
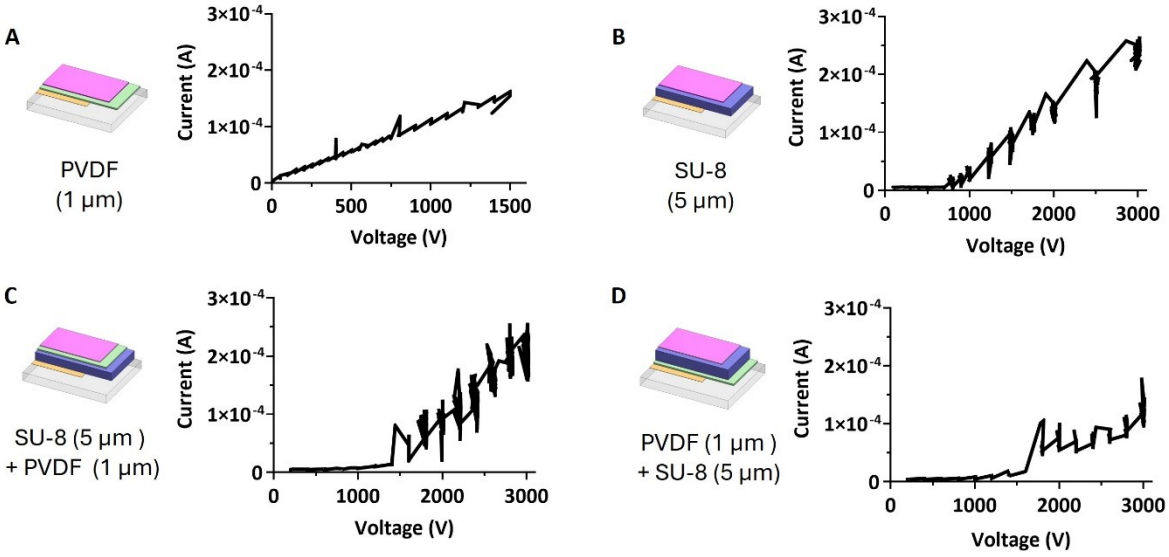
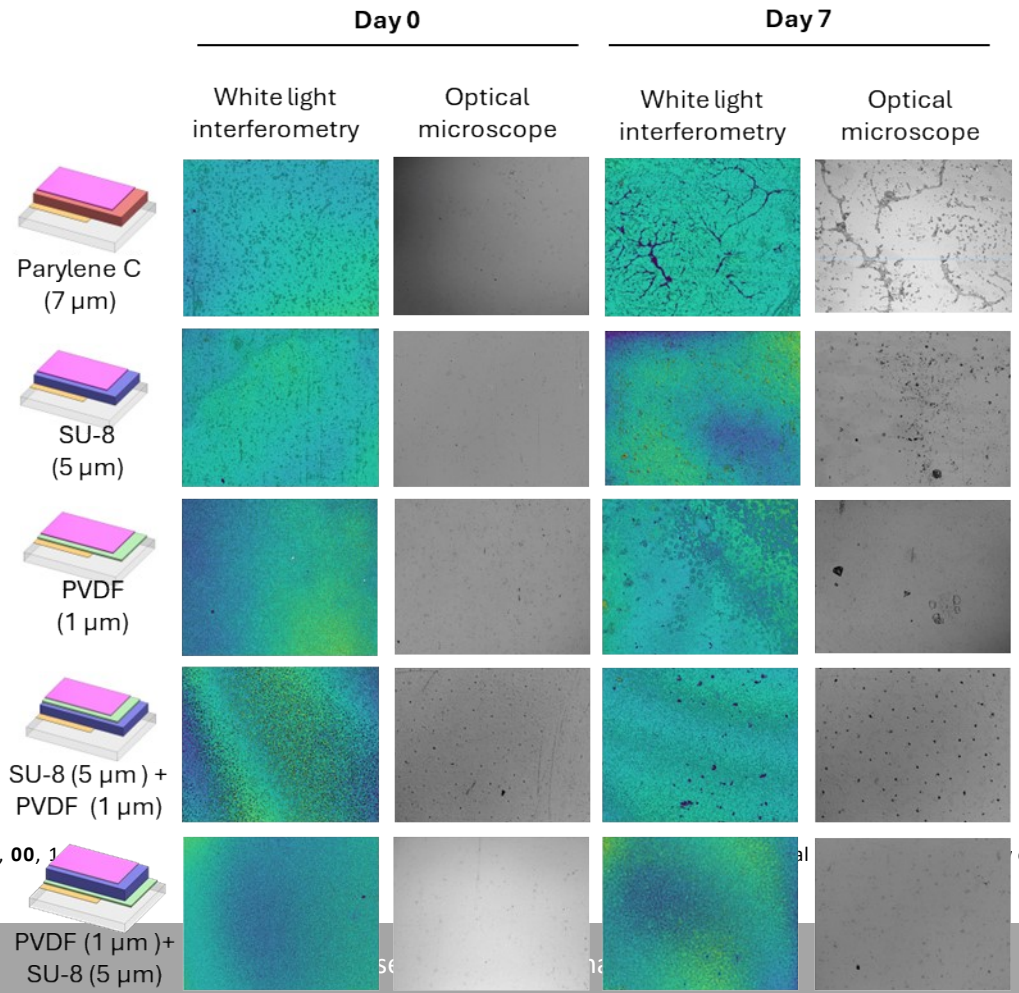


Fluoropel height measurements (nm)	
Sample 1	Sample 2
64.8	83.5
62.7	67.6
46.7	63.9
55.6	75.2

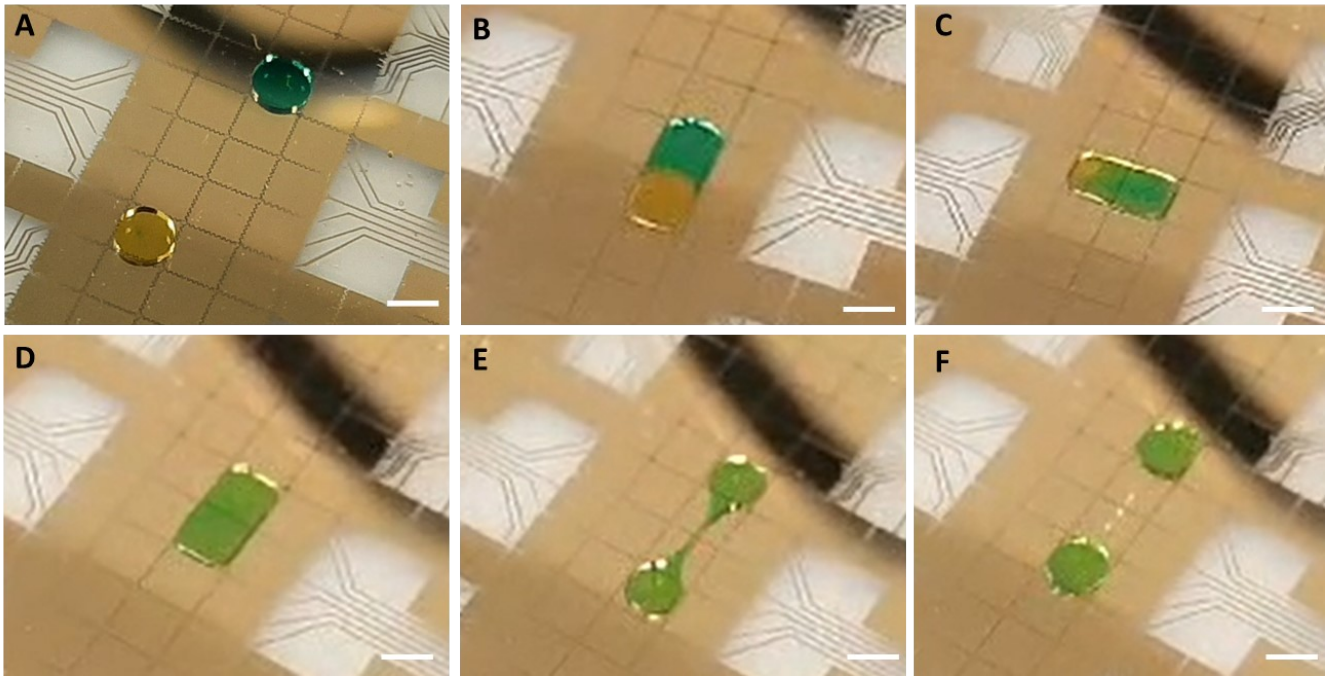
Supplementary Figure 1. Fluoropel coating imaging and characterization. **(A)** Schematic representation of fluoropel coating. **(B)** White light interferometry of the interface of fluoropel coating and glass substrate. **(C)** Representative profile of the fluoropel film measurement from the substrate. **(D)** All measurements taken of the fluoropel height at two independent samples (n = 2, 4 spots per each sample).



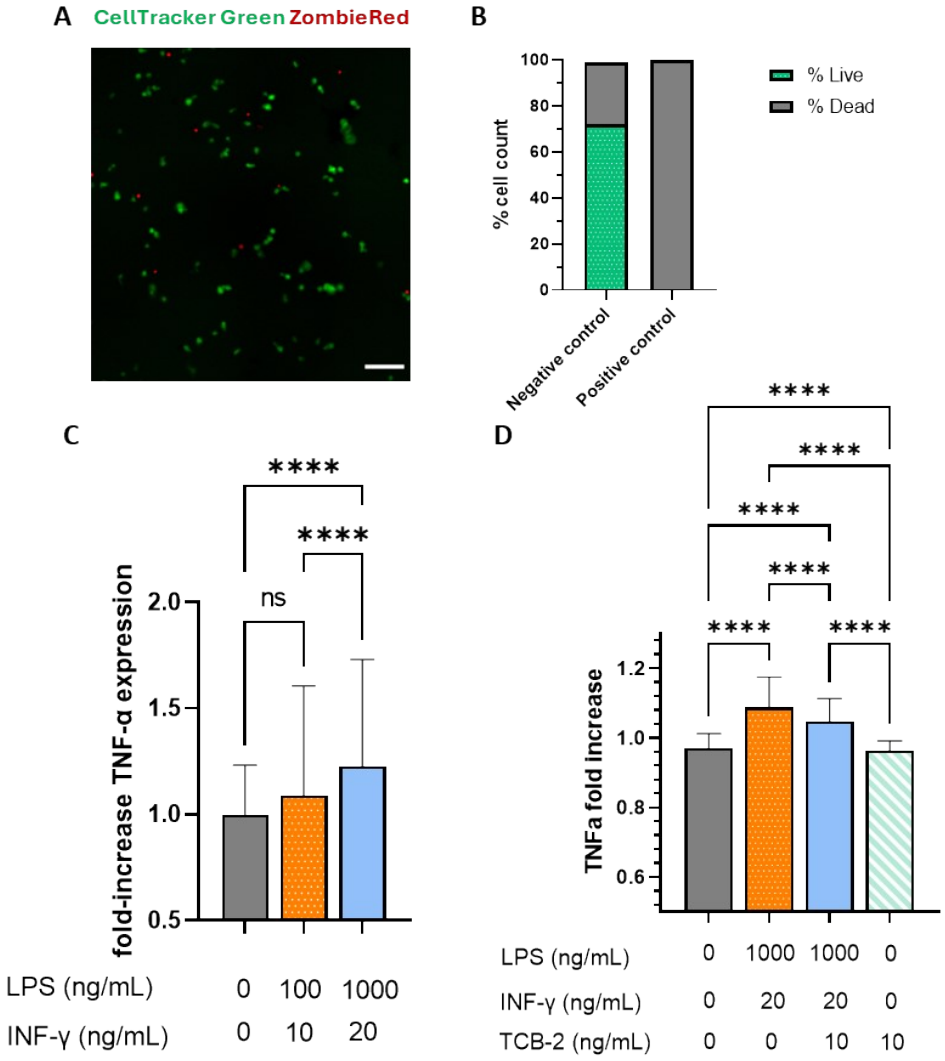
Supplementary Figure 2. Voltage current response and breakdown voltage of dielectric materials and dielectric material stacks. **(A)** Current output response of PVDF dielectric upon application of voltage up to 1500 V. No dielectric breakdown is detected, with the current output rising in direct correlation to voltage increase. **(B)** Current output response of SU-8 dielectric upon application of voltage up to 3000 V. Breakdown is detected by the spiked increase in the current output at 800 V. **(C)** Current output response of SU-8 + PVDF dielectric stack upon application of voltage up to 3000 V. Breakdown is detected by the spiked increase in the current output at 1400 V. **(D)** Current output response of SU-8 + PVDF dielectric stack upon application of voltage up to 3000 V. Breakdown is detected by the spiked increase in the current output at 100 V.



Supplementary Figure 3. Surface characterization of the dielectric materials and their combinations over 7 days. The samples were stored at 37 ^{o}C and 95% humidity during entire experiment and actuated at the same place with respective to the material actuation voltage every day for 20 seconds. The results are obtained using white light interferometry and phase-contrast microscope for visualization of the deformations.



Supplementary Figure 4. Droplet manipulation on the in-house fabricated DMF chip. **(A)** dispensed single droplets on the DMF electrode array. Droplet volume 740 nL **(B)** Fusion of two droplets. **(C)** Mixing of two droplets with still two separate phases observed. **(D)** Fully mixed solution. **(E)** Splitting on the mixed solution into individual droplets. **(F)** Two single droplets of mixed solution. Scale bar is 2 mm for all above images.



Supplementary Figure 5. Cell viability and TCB-2 potential drug testing control on a well plate. **(A)** Live-dead imaging of the