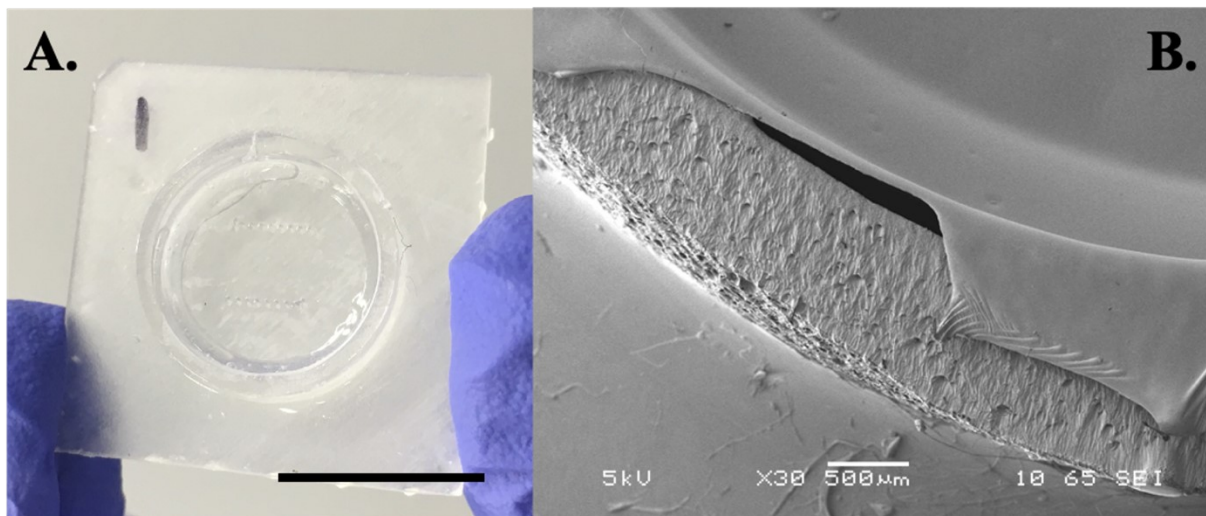


## Supporting Information

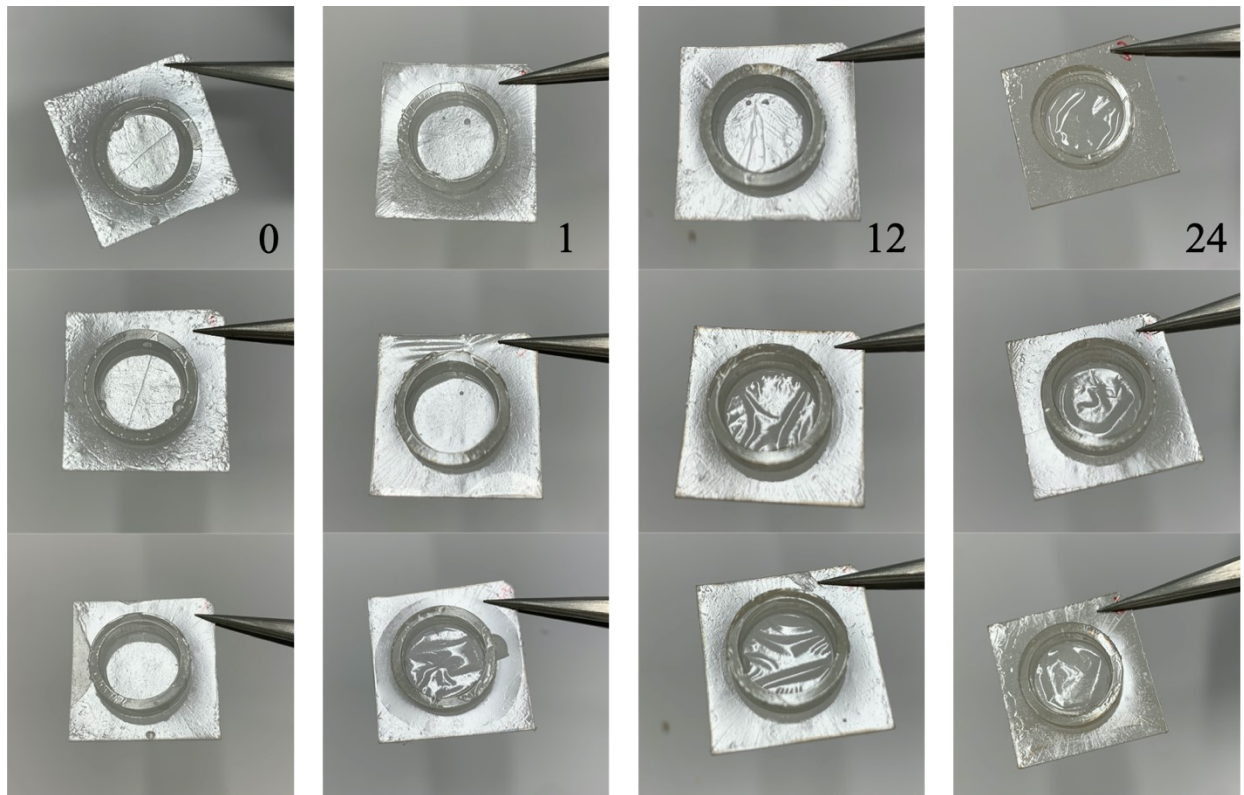
### Polydopamine Surface Functionalization of 3D Printed Resin Material for Enhanced Polystyrene Adhesion Towards Insulation Layers for 3D Microelectrode Arrays (3D MEAs)

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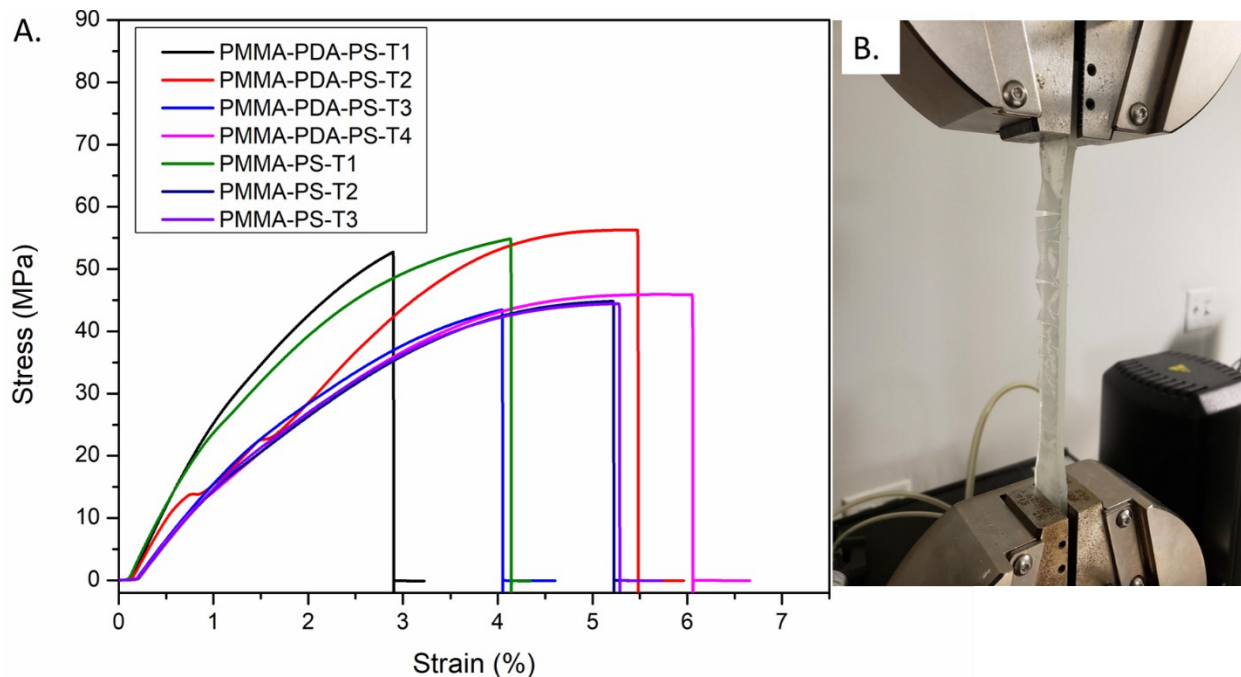
**Figure S1.** Camera (A) and SEM (B) images of “bubbling,” or delamination, of PS from the as printed 3D MEA substrate after incubation for 24 hours.



**Figure S2.** Images of control, 1-, 12-, and 24-hour PDA treated Asiga MAX printed culture wells coated with PS after incubation for 24 hours. Wrinkling as a result of no thermal annealing.

**Table S1.** Summary of adhesion tape peel testing on Asiga printed planar substrates, where the ratio is function of delaminated PS instances over the number of peel attempts (N=3).

		FLC	1-hr PDA	12-hr PDA	24-hr PDA
<b>Non-Incubated</b>	<b>As Is</b>	1.00	0.00	0.00	0.00
	<b>Thermally Annealed</b>	1.00	0.00	0.00	0.00
<b>Incubated</b>	<b>As Is</b>	1.00	0.33	0.67	0.33
	<b>Thermally Annealed</b>	1.00	1.00	0.33	0.33

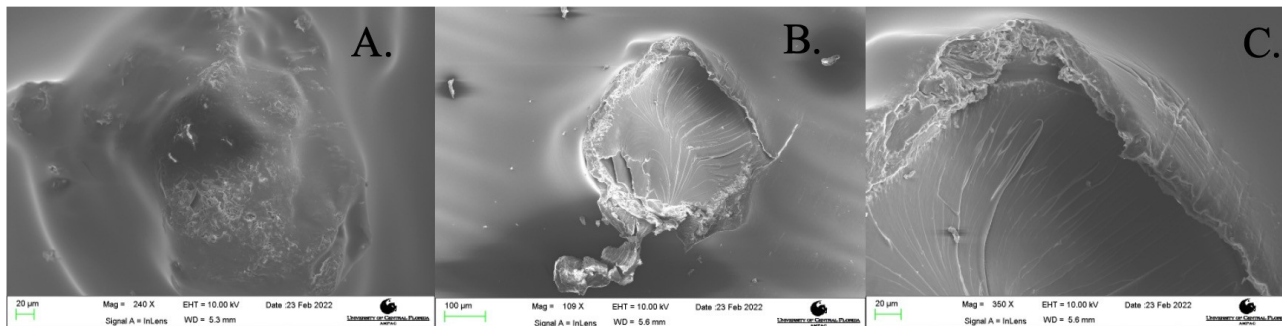


**Figure S3.** Stress versus strain plot for PMMA-PDA-PS and PMMA-PS dog bone samples (A.), delamination of PS observed in PMMA-PS sample (B.)

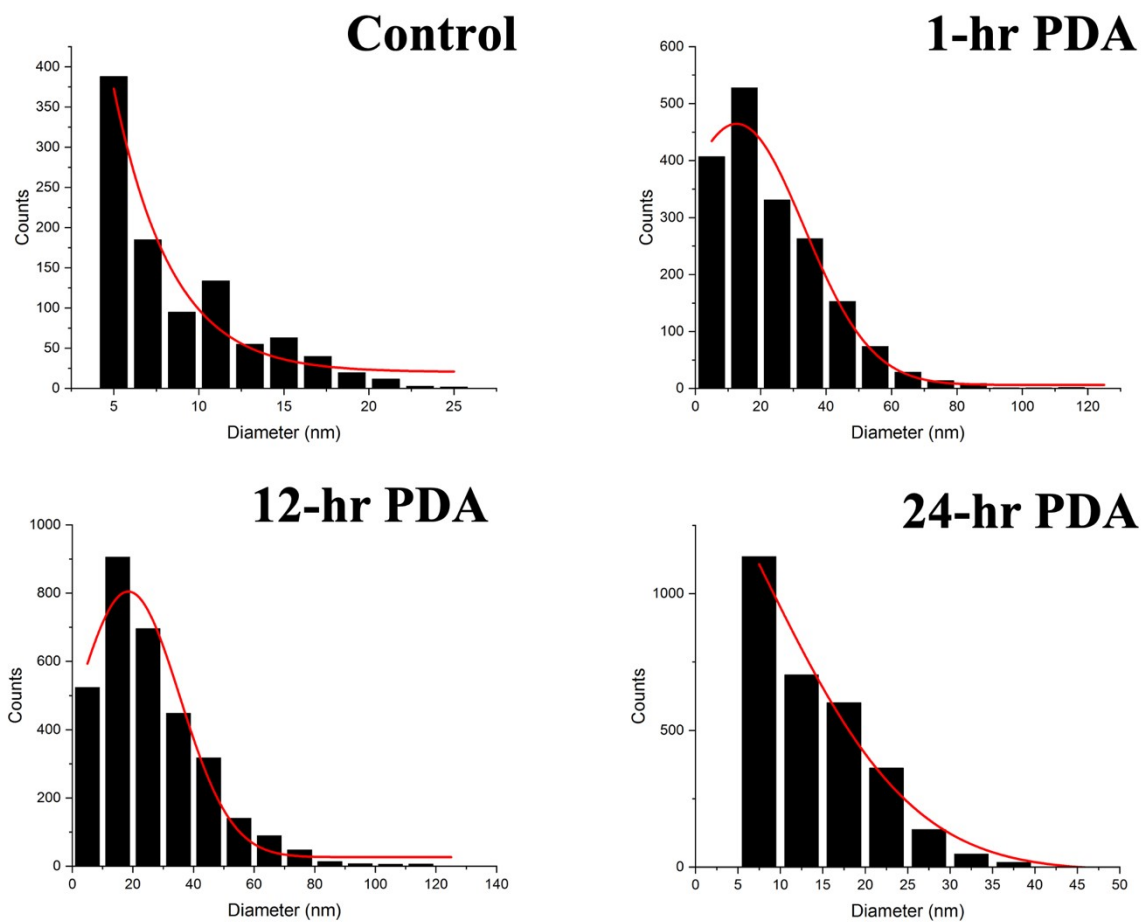
**Table S2. Mechanical properties of PMMA-PS with/without PDA**

Sample	Young's Modulus (MPa)	Elongation at break (%)	Tensile strength at breakage (MPa)
PMMA-PDA-PS-T1	29.135	2.88	52.80
PMMA-PDA-PS-T2	15.405	5.48	56.04
PMMA-PDA-PS-T3	19.062	4.04	43.17
PMMA-PDA-PS-T4	17.486	6.04	45.65
Average PMMA-PDA-PS	20.272	4.61	49.415
PMMA-PS-T1	25.035	4.12	54.82
PMMA-PS-T2	18.159	5.21	44.85
PMMA-PS-T3	17.867	5.28	44.45
Average PMMA-PS	20.353	4.87	48.04

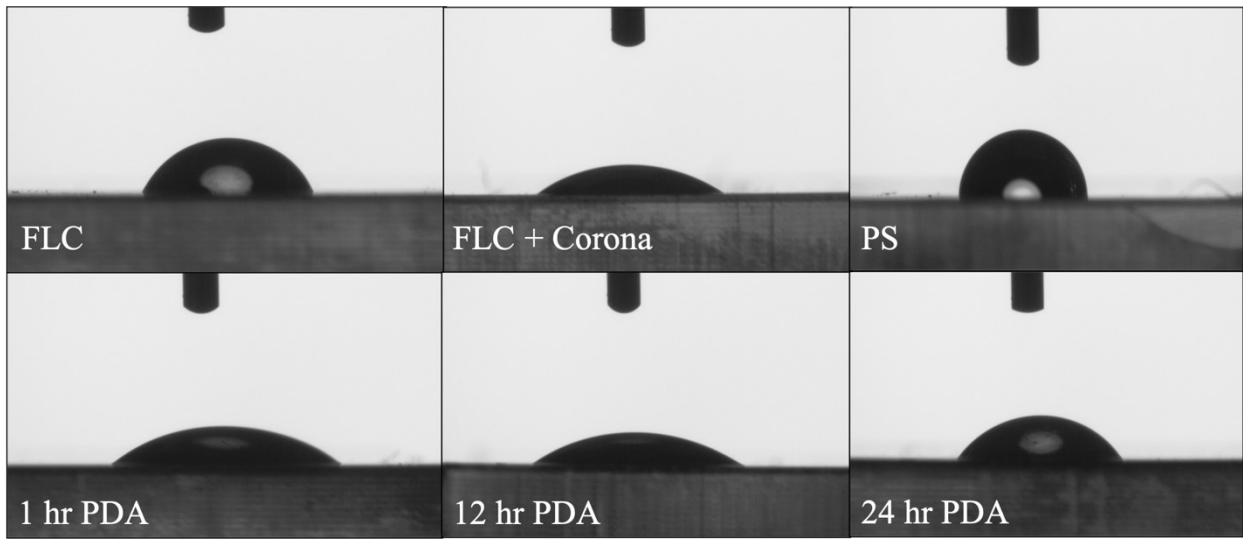
(Note: All data reported is an average of at least N=3 samples).



**Figure S4.** SEM images of (A) PDA-PS covered 3D printed microneedles, (B) mechanically broken 3D printed microneedle tip, and (C) close-up view of adhesion of PDA-PS coating.



**Figure S5.** Gaussian distribution of nanoaggregates processed from the SEM images in Figure 5. All data reported is an average of at least N=3 samples.



**Figure S6.** Water contact images of the various surfaces.