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Supporting Material for

Matrix-Assisted Dip-Pen Nanolithography (MA-DPN) and Polymer Pen Lithography (MA-PPL) **

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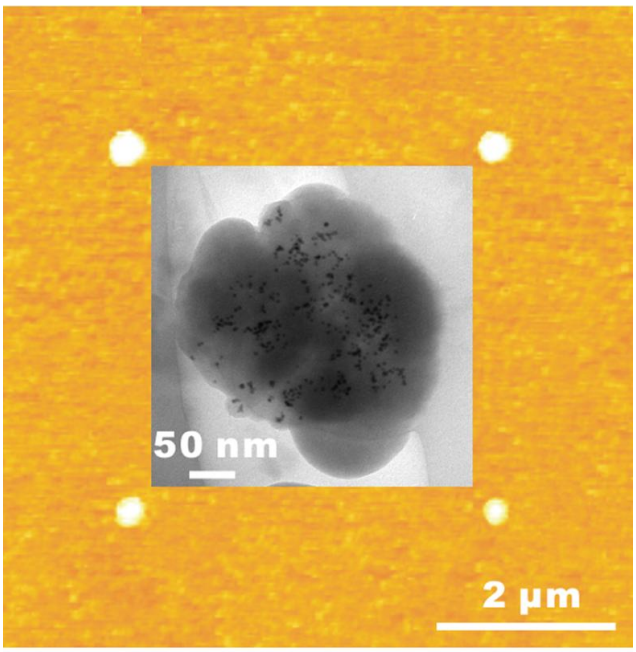

Figure S1. AFM topographical image of four AuNP-PEG dots patterned on a TEM grid. The inset is a TEM micrograph of the spot, and the dark circles are AuNPs.

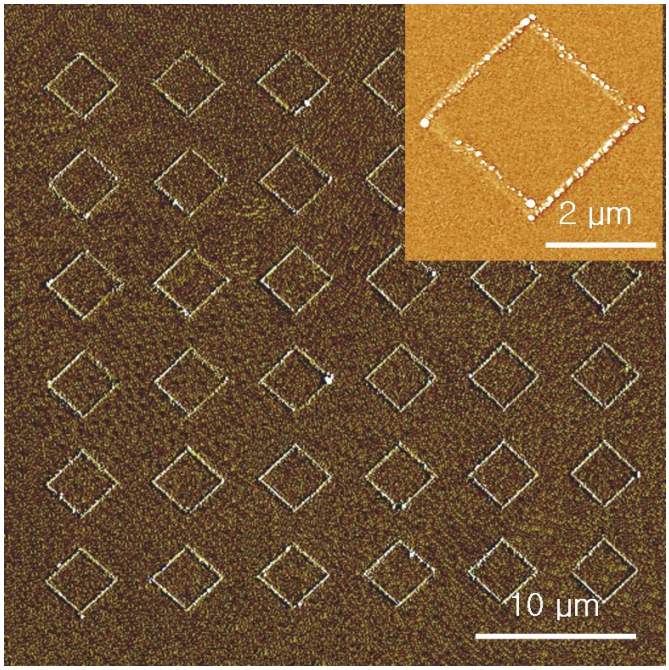

Figure S2. Magnetic force microscopy images of square patterns of PEG-Fe_3O_4 magnetic nanoparticles patterned on a Si/SiO_x surface. White indicates areas of high magnetism.

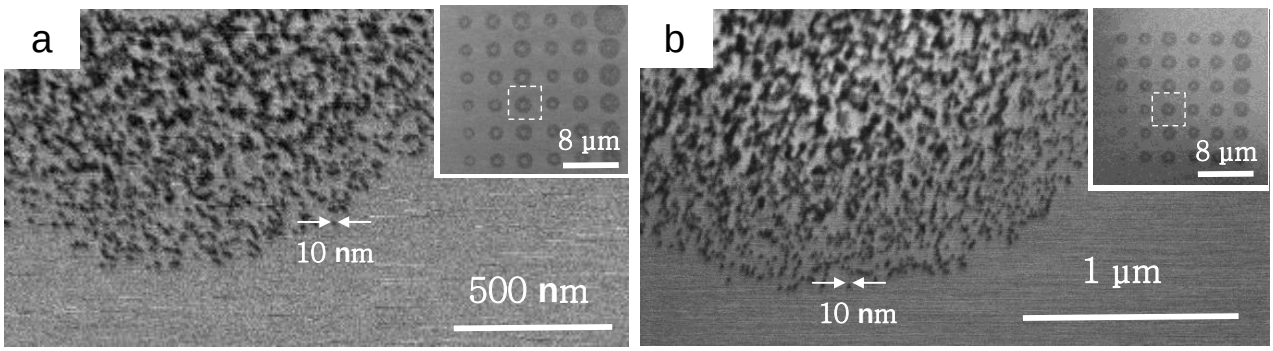

Figure S3. SEM images of Fe_3O_4 patterned on a Si/SiO_x surface by MA-DPN followed by (a) exposure to O_2 plasma and (b) washing with 1:1 water/ethanol. These magnified images from the patterns (dotted box in the inset) demonstrate that the Fe_3O_4 magnetic nanoparticles are confined only to where the PEG-nanoparticle ink had been deposited.

		HMDS	Au	SiO_2	GaAs
Diameter (μm)	1s	1.054 ± 0.166	1.068 ± 0.045	0.898 ± 0.039	1.172 ± 0.036
	3s	1.250 ± 0.110	1.432 ± 0.045	1.328 ± 0.078	1.484 ± 0.032
	10s	1.680 ± 0.055	1.953 ± 0.078	1.927 ± 0.045	2.161 ± 0.090
Height (μm)	1s	0.187 ± 0.035	0.088 ± 0.002	0.119 ± 0.006	0.132 ± 0.006
	3s	0.240 ± 0.026	0.122 ± 0.013	0.165 ± 0.007	0.181 ± 0.007
	10s	0.331 ± 0.034	0.176 ± 0.007	0.234 ± 0.007	0.240 ± 0.008
Average aspect ratio		0.185 ± 0.008	0.086 ± 0.006	0.126 ± 0.005	0.115 ± 0.006

Table S1. Diameter, height and aspect ratio of PEG-Fe_3O_4 magnetic nanoparticle features patterned by MA-PPL. The PEG-Fe_3O_4 ink was deposited on Au, Si/SiO_x, and GaAs surfaces as well as an HMDS coated Si/SiO_x wafer.

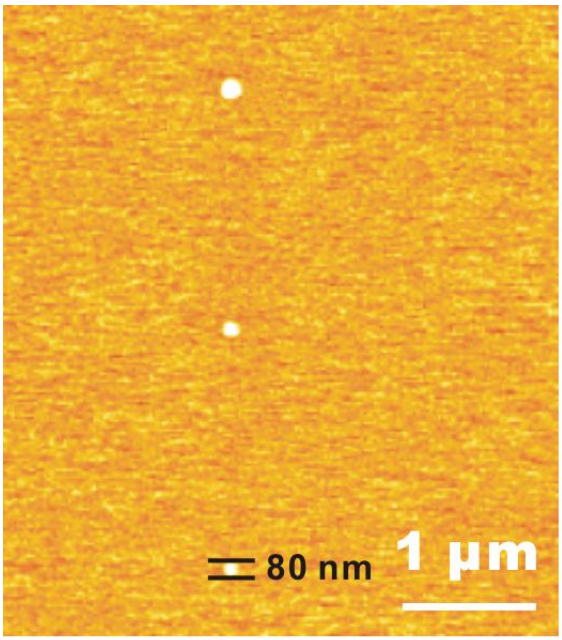

Figure S4. Topographic AFM images of C_{60}/PEG dot array at contact times of 16, 8, and 4 s (top to bottom). Feature sizes as small as 80 nm could be obtained with a 4 s contact time at humidity of 65 %, proving that sub-100 nm features can be obtained using MA-DPN.

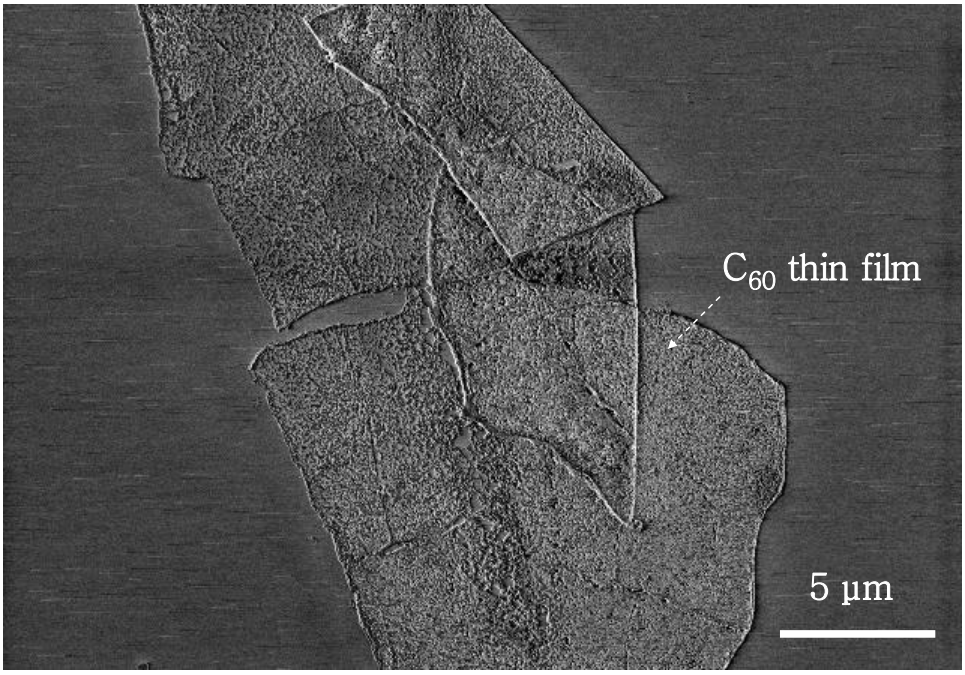

Figure S5. SEM image of C_{60} thin films intentionally patterned in a large scale by MA-DPN on a Si/SiO_x surface. The image shows that C_{60} patterned by MA-DPN at a NM concentration of 10mg/mL is sufficient to form thin C_{60} films after exposure to O_2 plasma. (Ref. W. Kratschmer *et. al*., *Nature* **347**, 354, (1990))