Structured Metal Films on Silicone Elastomers

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Supplementary Information

Schematic of Gatan Sputter Coating system

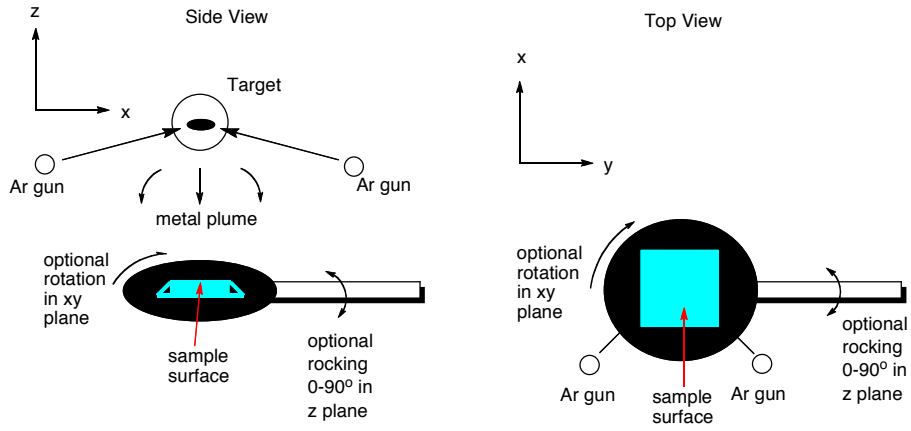

Figure 1S: Two Penning guns, impinge at 45° to the Metal Target (Au, Pt, Cr, W, C), releasing metal atoms/clusters in a plume that then falls vertically 53 mm to the surface of the sample, leading to the development of a metal film. The sample holder can rotate in the xy plane and/or rock 0-90° towards and away from the vertiacal xz plane holding the target. The thickness of the metal film is established piezoelectrically using a quartz surface, simultaneously with sample coating. Changes in oscillation frequency are calibrated for the various coating materials by the manufacturer.

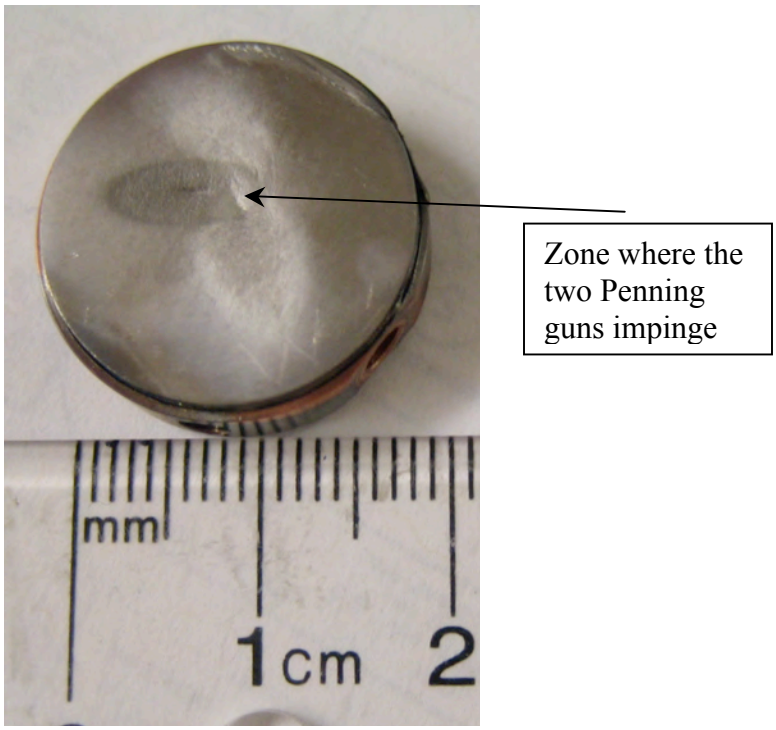

Figure 2S: Metal target (W) showing impingement zone of the Argon ions.

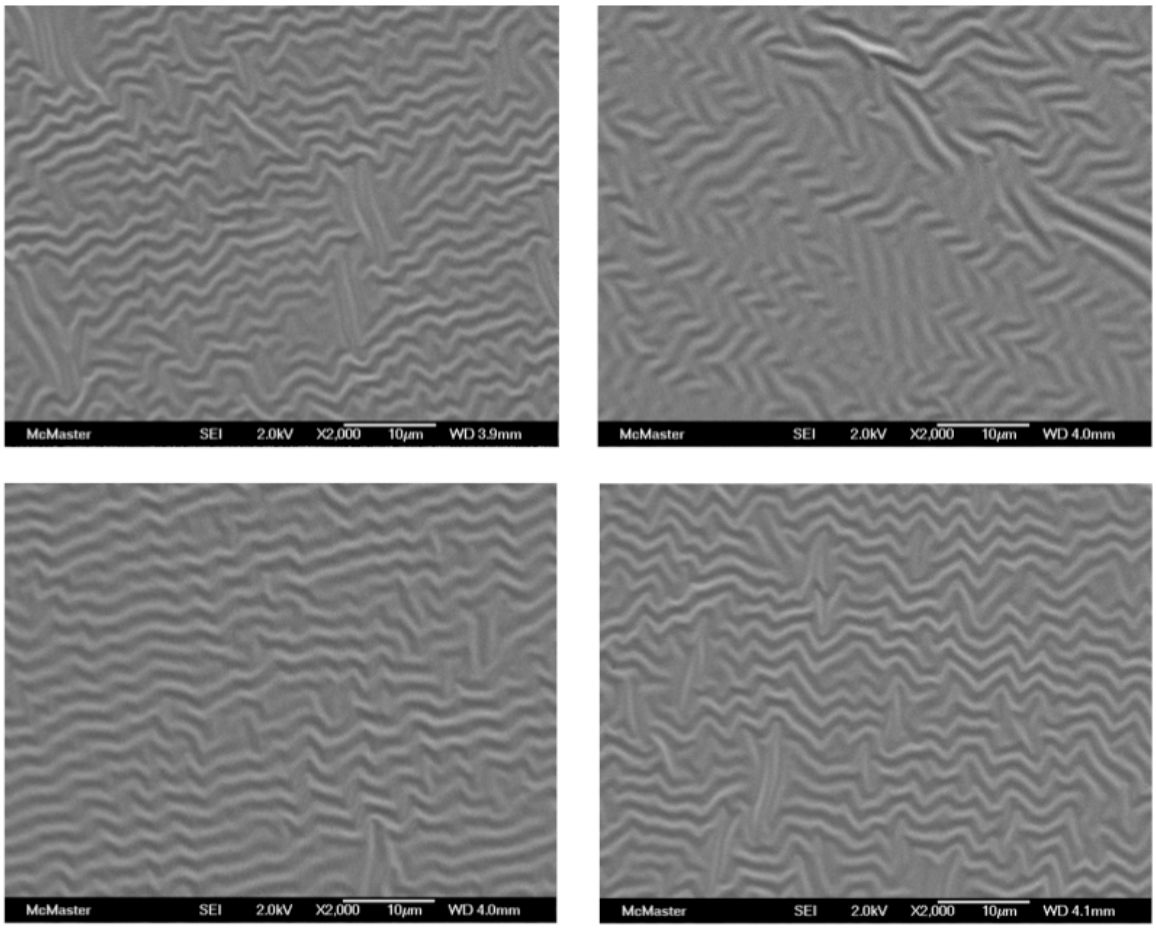

Figure 3S: Comparison of different coating settings: SEM micrographs of 15 nm platinum-coated PDMS samples. A: no rotation, no rocking. B: rocking (30°, 16°/sec). C: rotation (30 rpm). D: rocking (30°, 16°/sec) and rotation (30 rpm). The scale bar represents 20 μm.

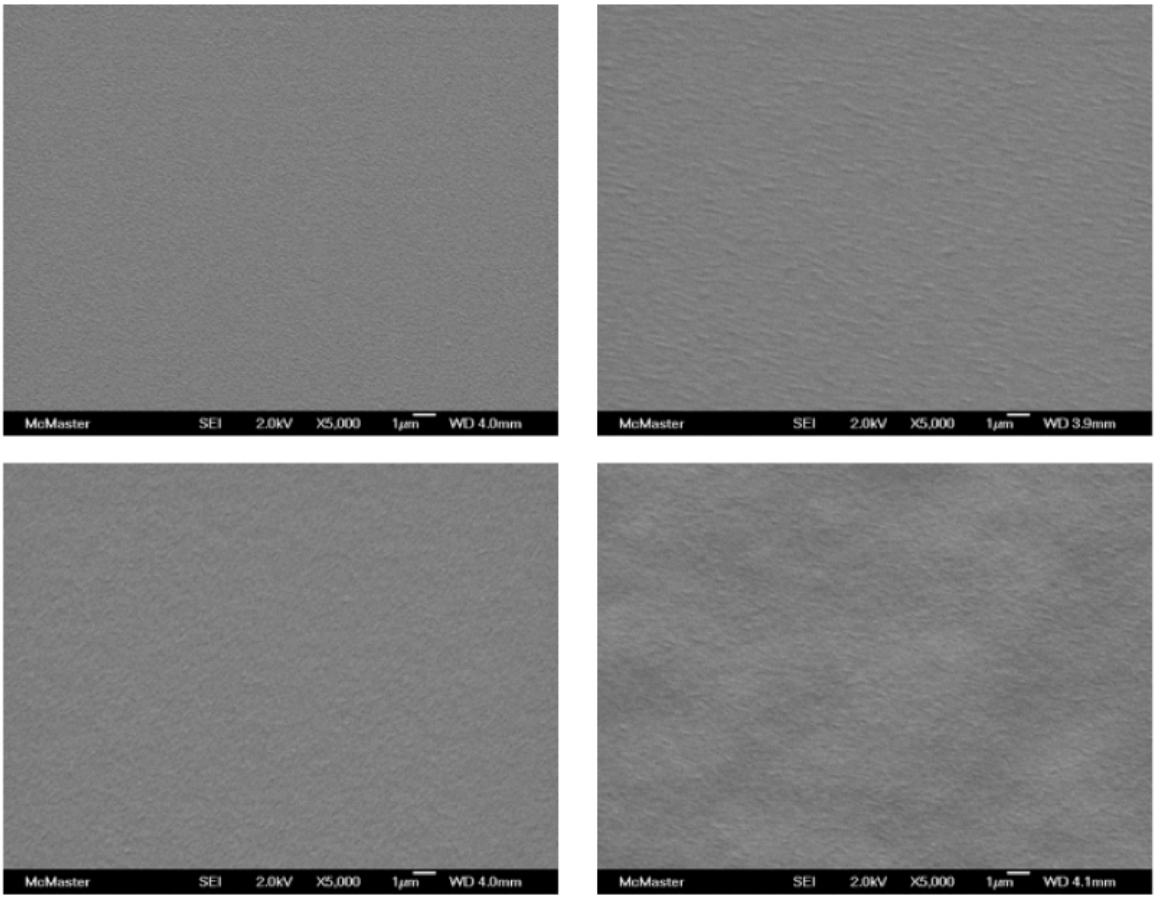

Figure 4S: SEM micrographs of gold-coated PDMS samples. A: 5 nm gold coating. B: 15 nm gold coating. C: 30 nm gold coating. D: 50 nm gold coating. Large scale bar is 10 μm.

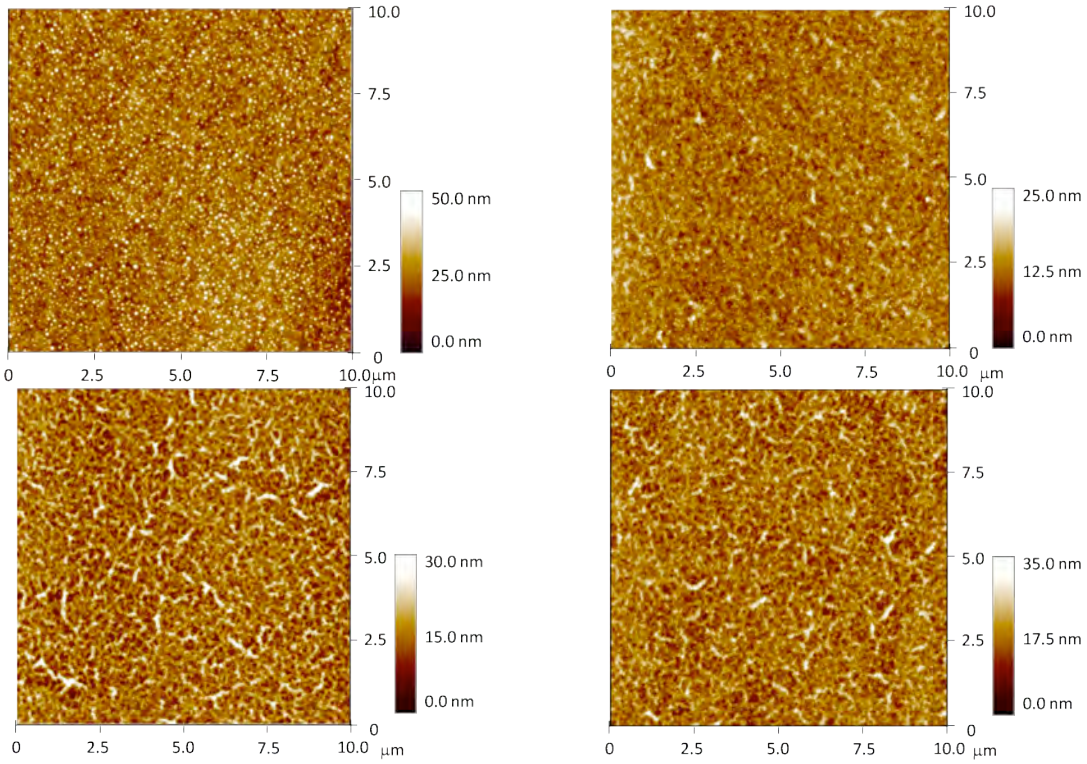

Figure 5S: AFM micrographs of gold-coated PDMS samples. A: 5 nm gold coating. B: 15 nm gold coating. C: 30 nm gold coating. D: 50 nm gold coating.

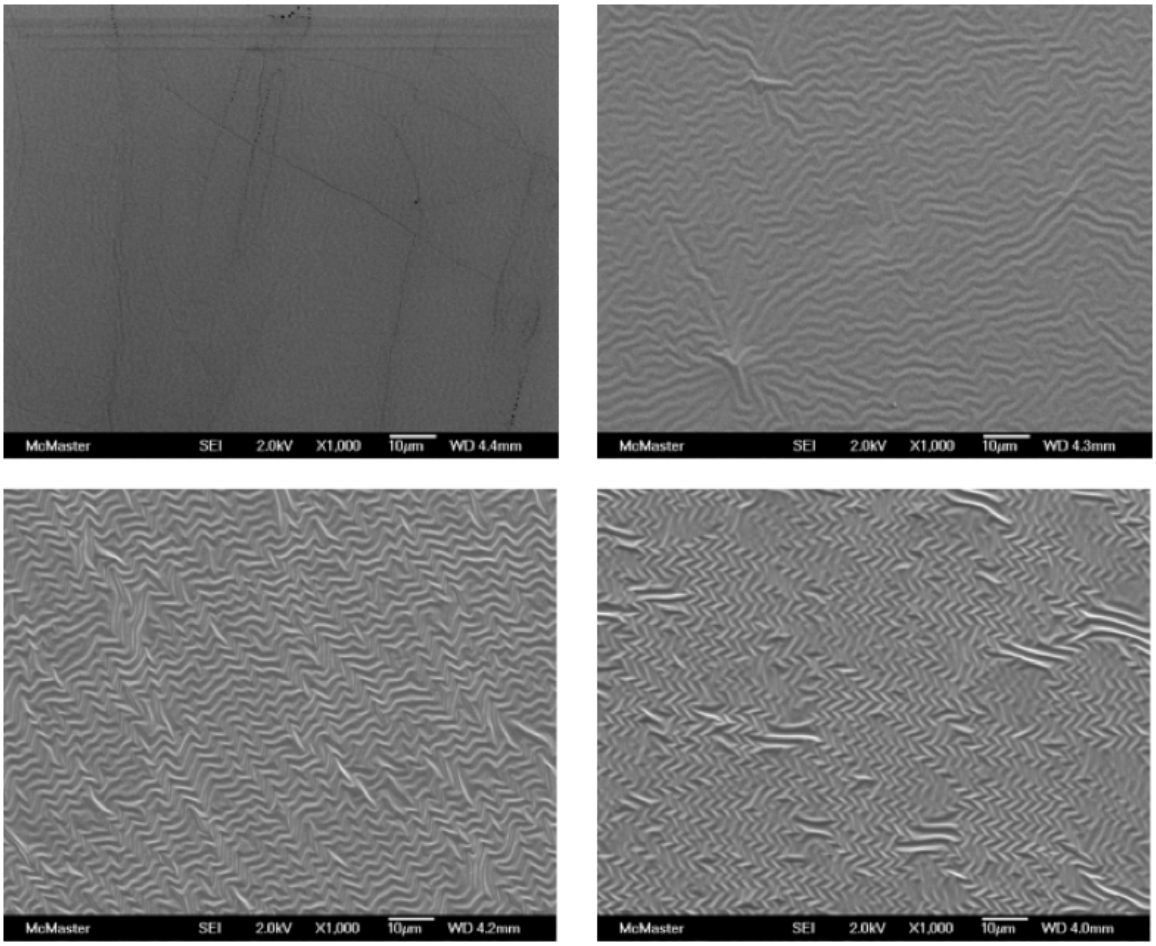

Figure 6S: SEM micrographs of platinum-coated PDMS samples. A: 5 nm platinum coating. B: 15 nm platinum coating. C: 30 nm platinum coating. D: 50 nm platinum coating. Scale bar is 10 μm.

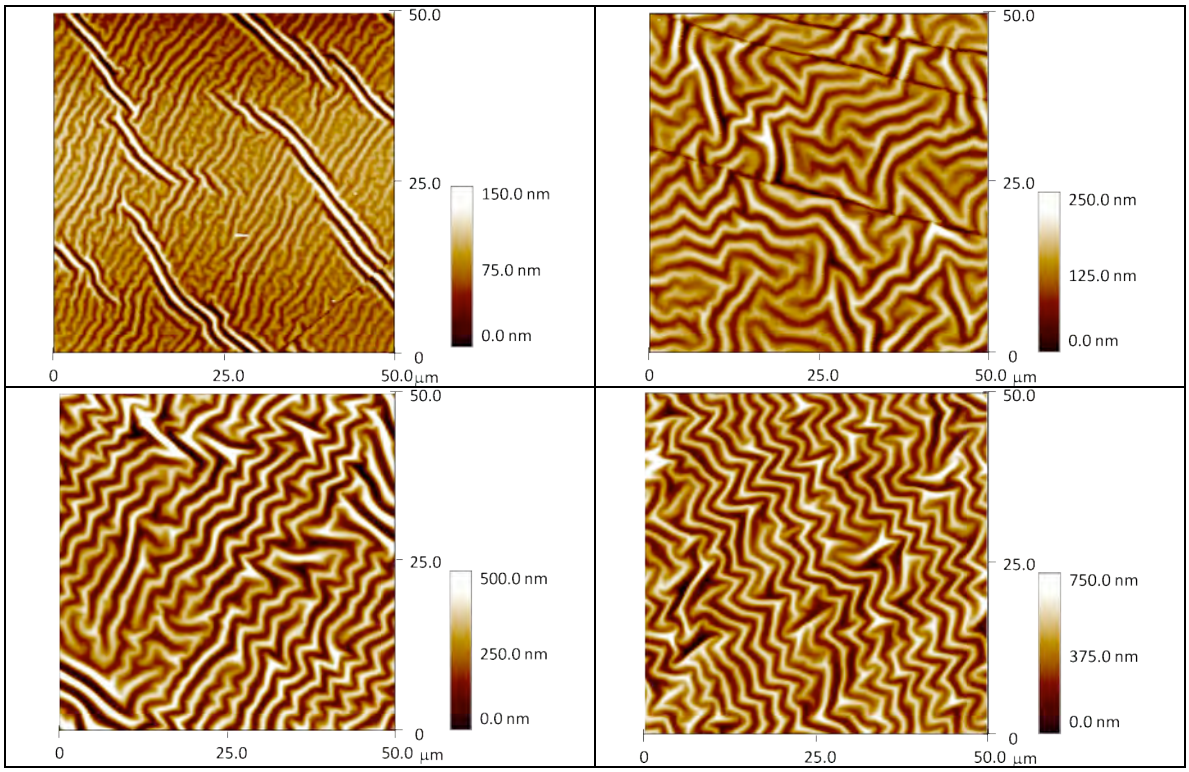

Figure 7S: AFM micrographs of platinum-coated PDMS samples. A: 5 nm platinum coating. B: 15 nm platinum coating. C: 30 nm platinum coating. D: 50 nm platinum coating.

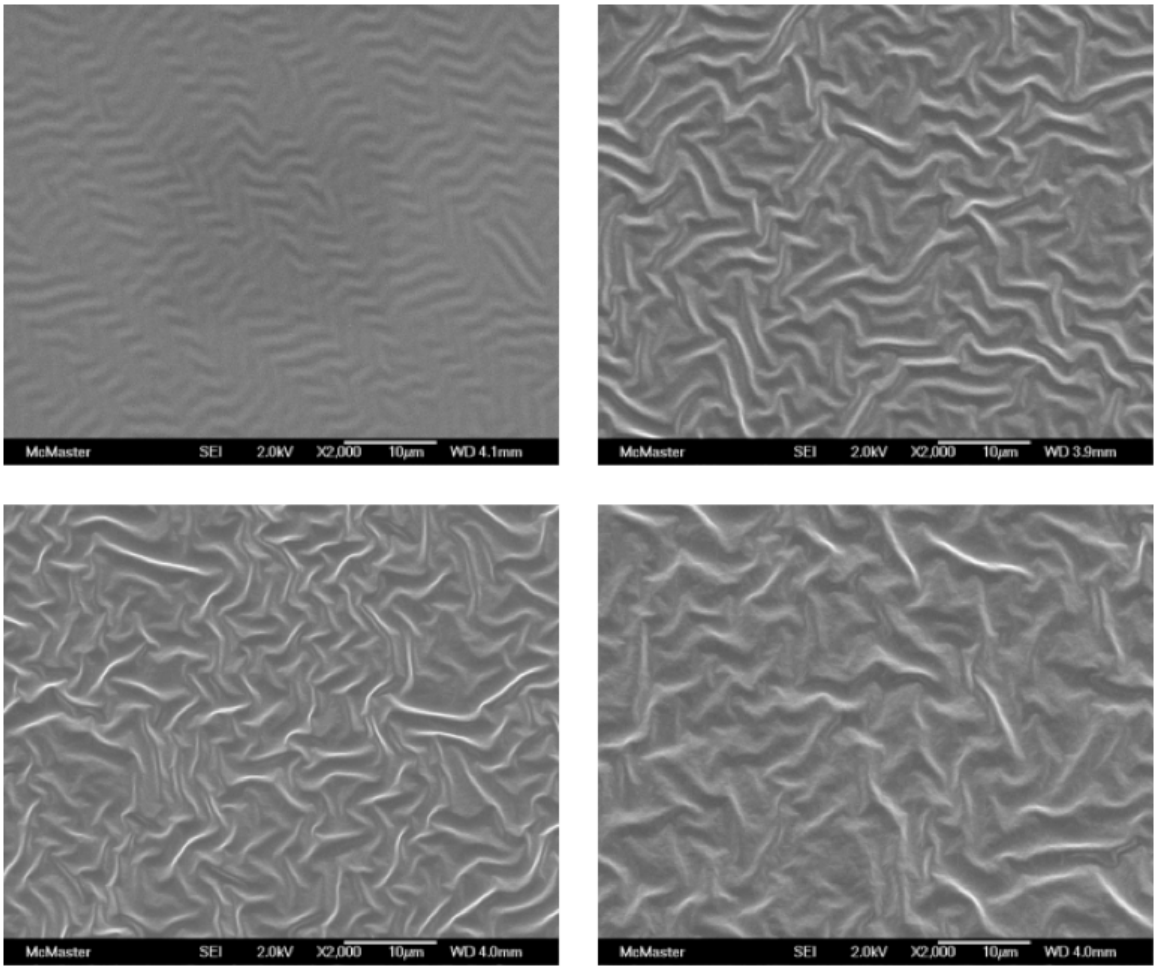

Figure 8S: SEM micrographs of tungsten-coated PDMS samples. A: 5 nm tungsten coating. B: 15 nm tungsten coating. C: 30 nm tungsten coating. D: 50 nm tungsten coating. Scale bar is 10 μm.

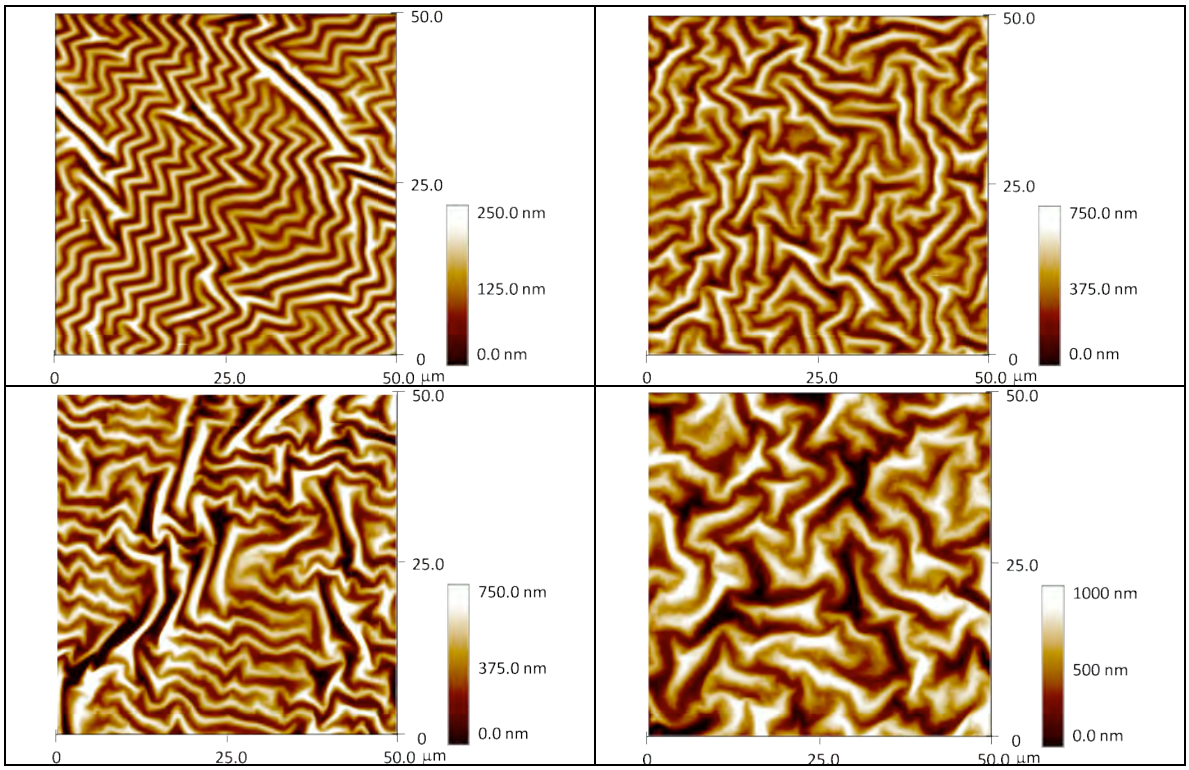

Figure 9S: AFM micrographs of tungsten-coated PDMS samples. A: 5 nm tungsten coating. B: 15 nm tungsten coating. C: 30 nm tungsten coating. D: 50 nm tungsten coating.

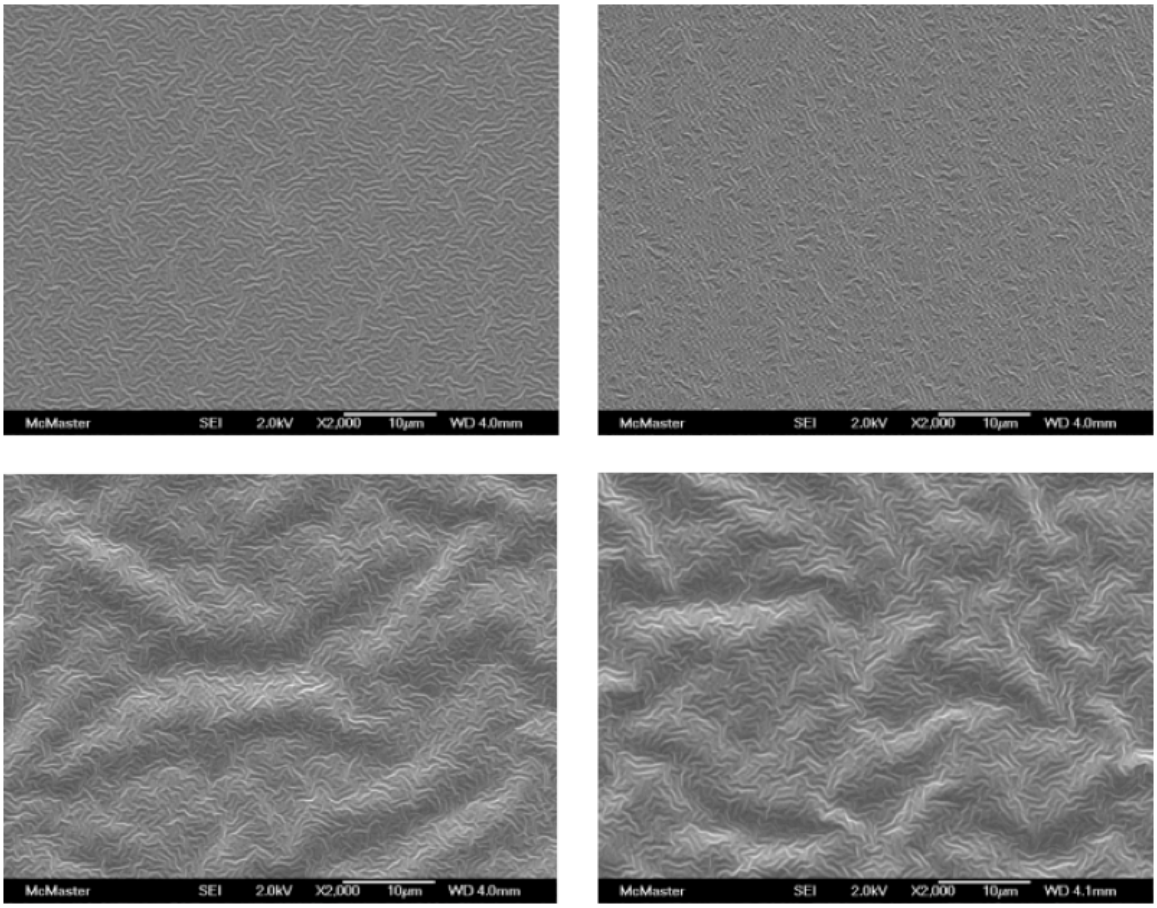

Figure 10S: SEM micrographs of chromium-coated PDMS samples. A: 5 nm chromium coating. B: 15 nm chromium coating. C: 30 nm chromium coating. D: 50 nm chromium coating. Scale bar is 10 μm.

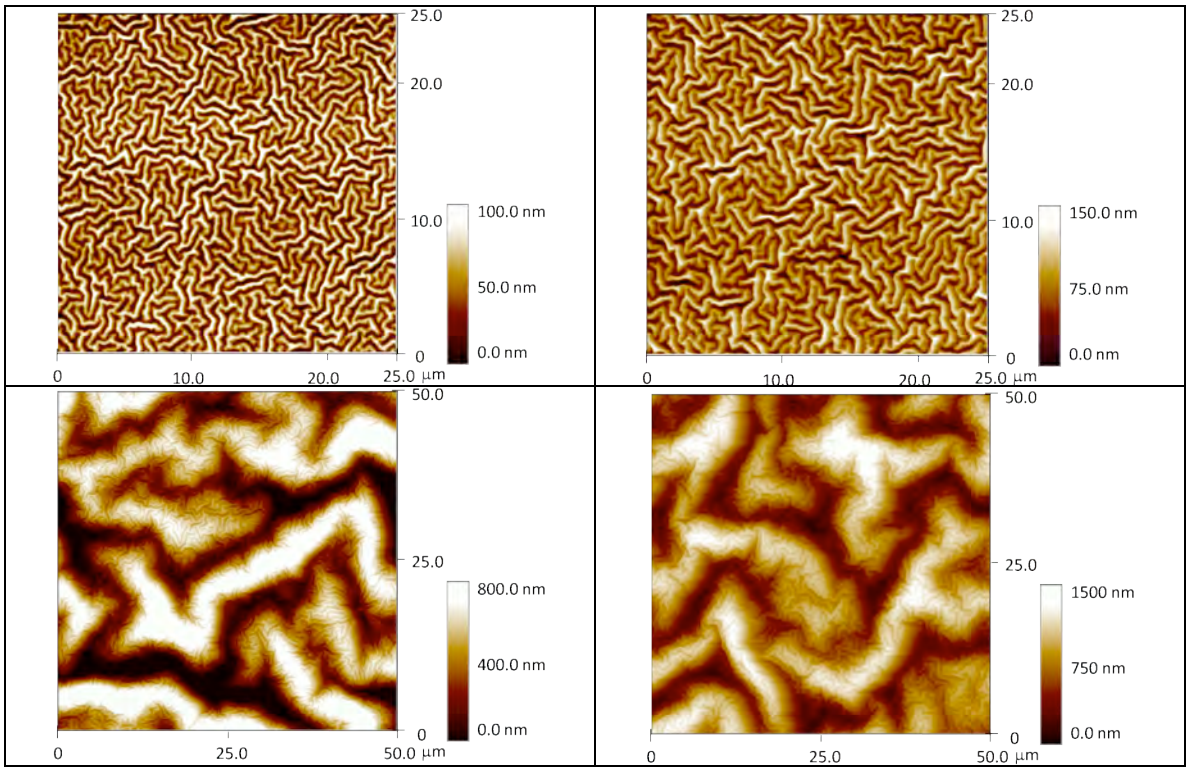

Figure 11S: AFM micrographs of chromium-coated PDMS samples. A: 5 nm chromium coating. B: 15 nm chromium coating. C: 30 nm chromium coating. D: 50 nm chromium coating.

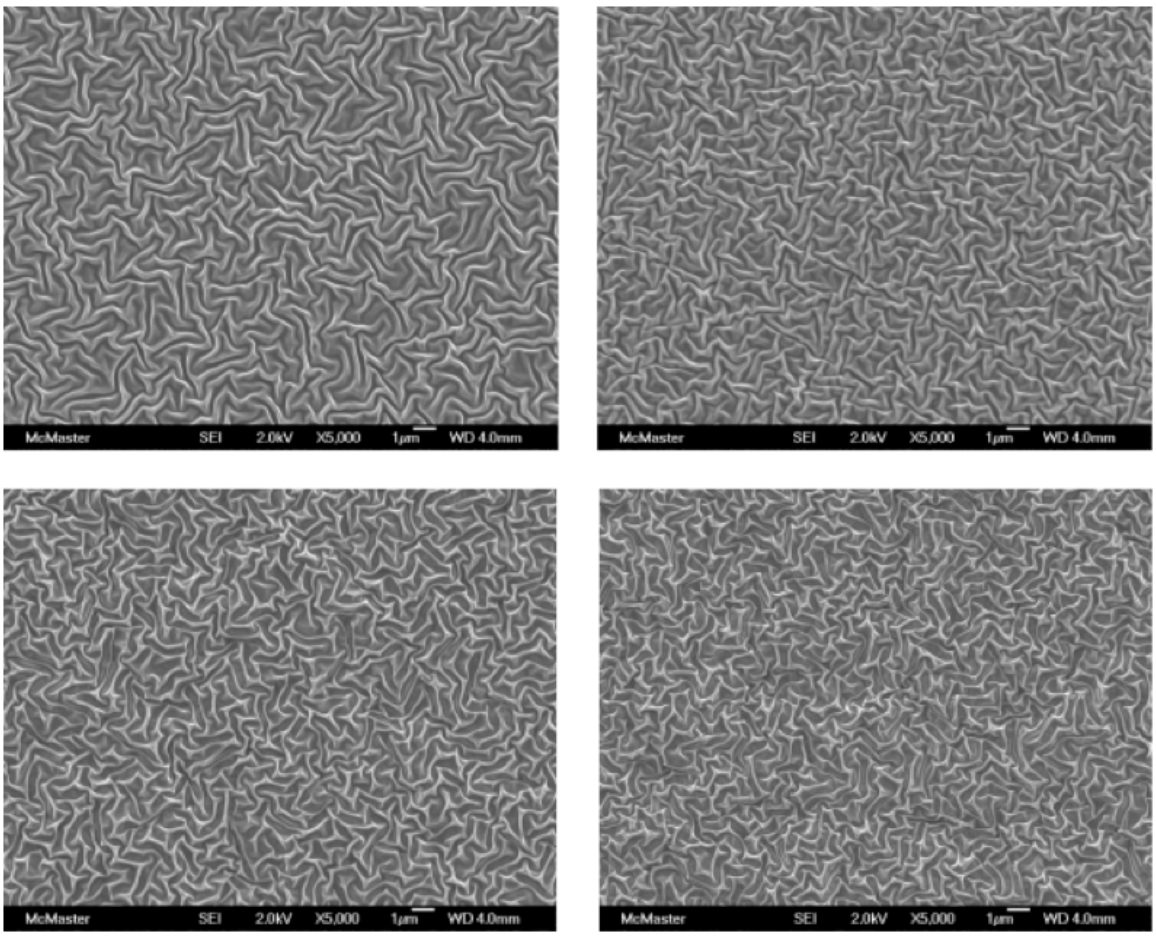

Figure 12S: SEM micrographs of carbon-coated PDMS samples. A: 5 nm carbon coating. B: 15 nm carbon coating. C: 30 nm carbon coating. D: 50 nm carbon coating. Large scalebar is 10 μm.

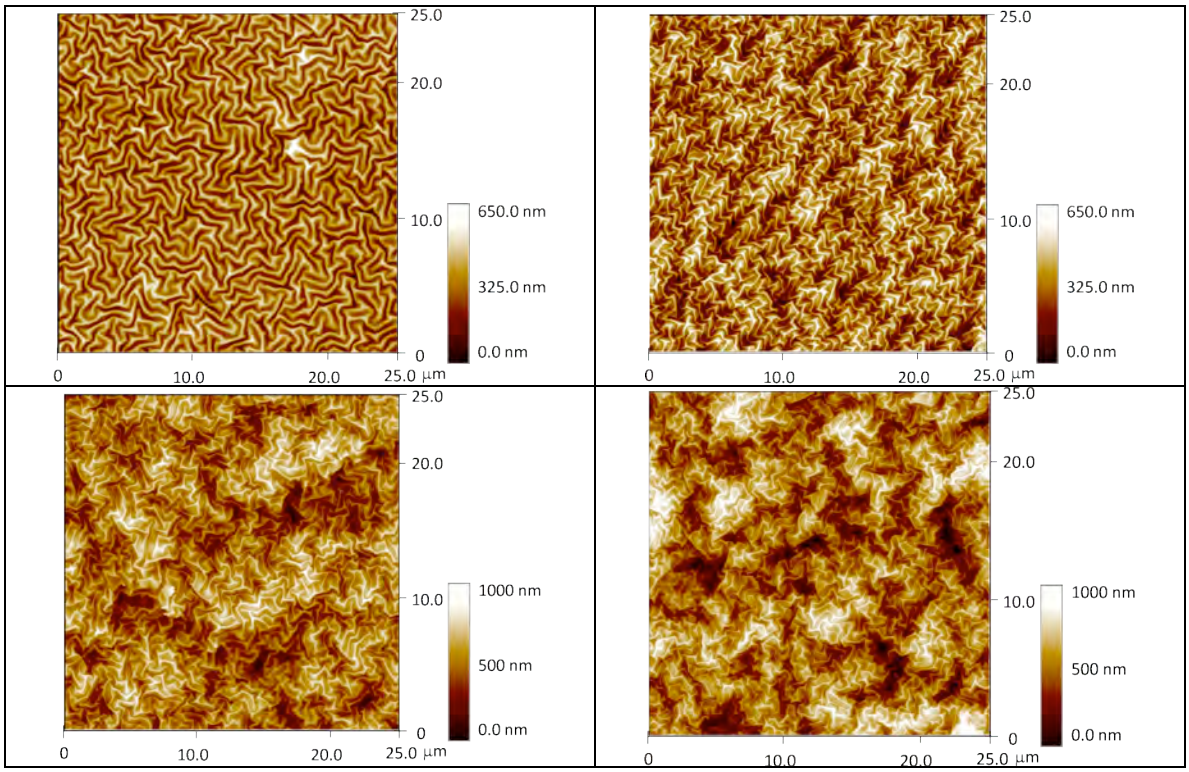

Figure 13S: AFM micrographs of carbon-coated PDMS samples. A: 5 nm carbon coating. B: 15 nm carbon coating. C: 30 nm carbon coating. D: 50 nm carbon coating.

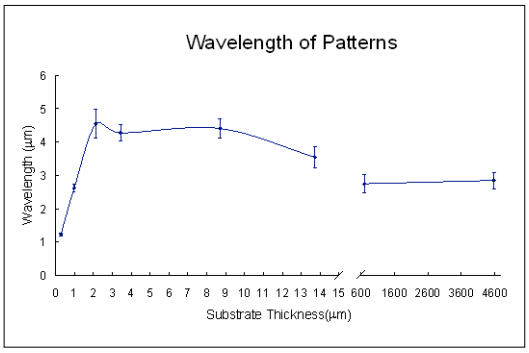

Figure 14S: Comparison of wavelengths of patterns on thin silicone films.

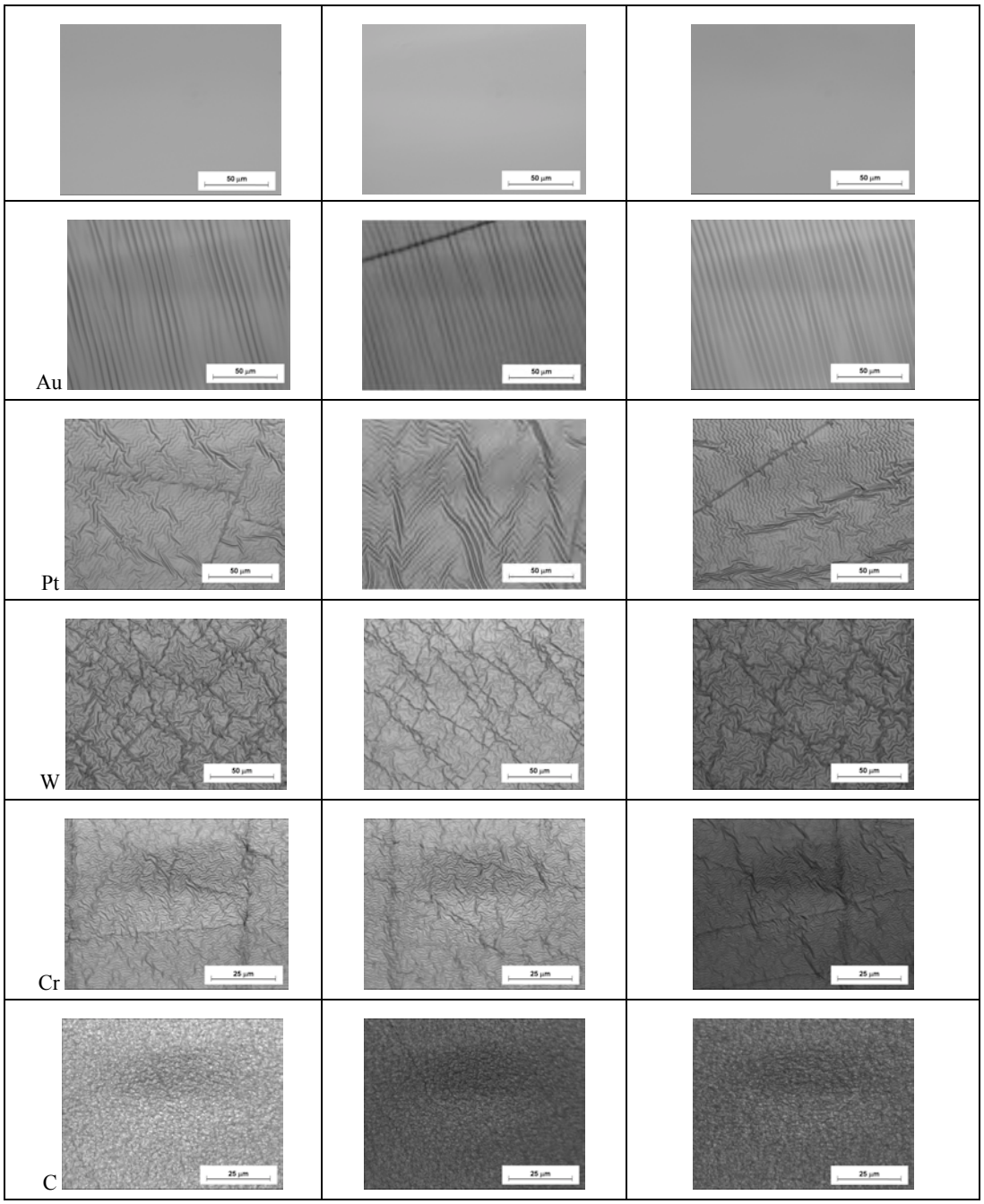

Figure 15S: Initially formed, re-heated and re-cooled samples. From the top row to the bottom, the samples were uncoated; coated with Au, Pt, W, Cr and C, respectively. The coating thickness is 30nm for all the samples. In the left column, are original samples; the middle column, are the re-heated samples; and the right column, are the cooled samples. Patterns on the gold-coated sample were found only on the edges of sample, and covered a very small area. No changes were noted on featureless gold surfaces.