Supporting Information

1. AFM Images of Channel Accelerating Voltage Dosage Study

Figure S1. AFM images of channels patterned on L-PDMS with constant 30 kV accelerating voltage. The exposure dosages range from 201 μC/cm^2 in the upper left to 2010 μC/cm^2 in the lower right. At low dosages a raised line is patterned, and increasing the dosage allows for fabrication of recessed channels.

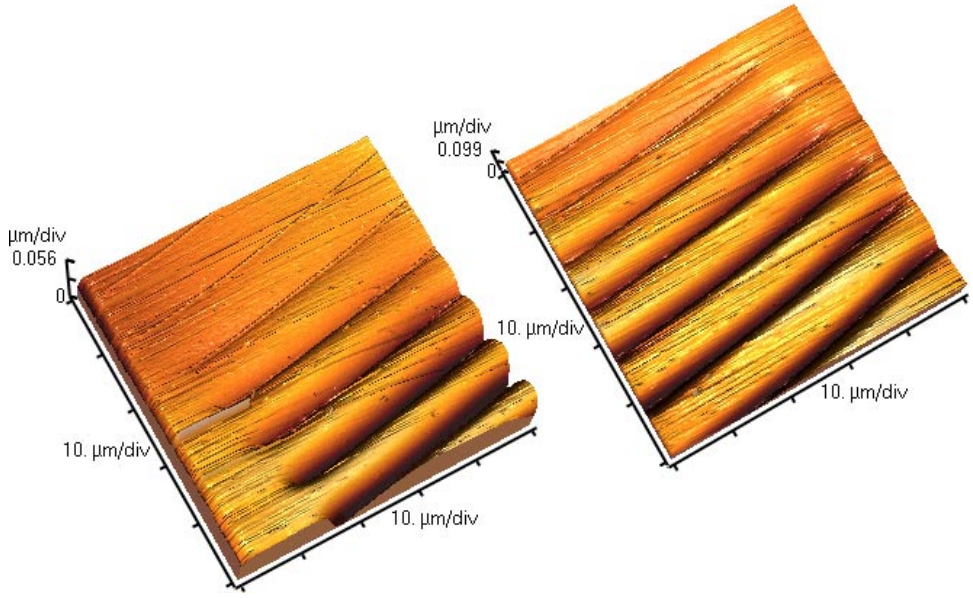
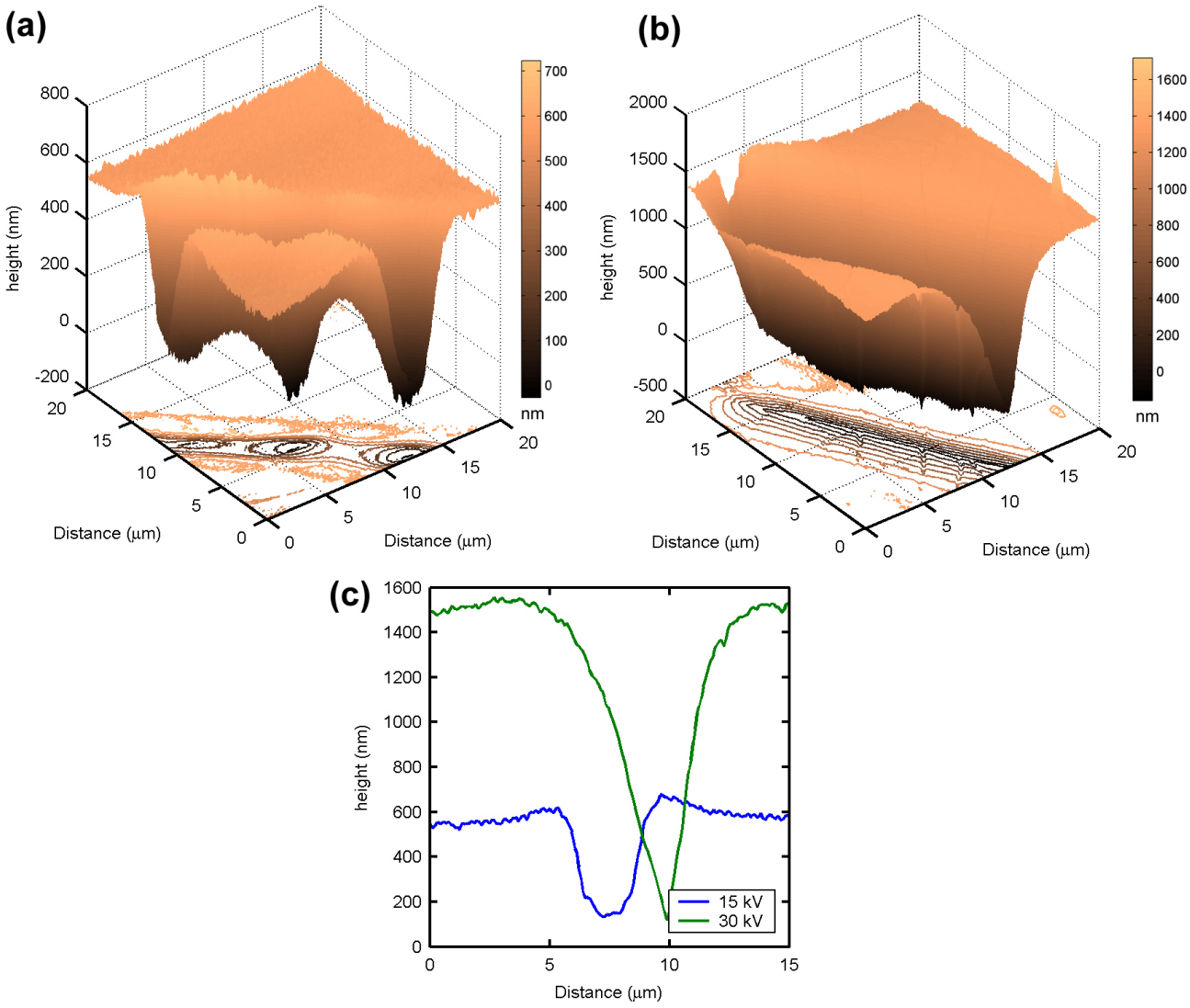
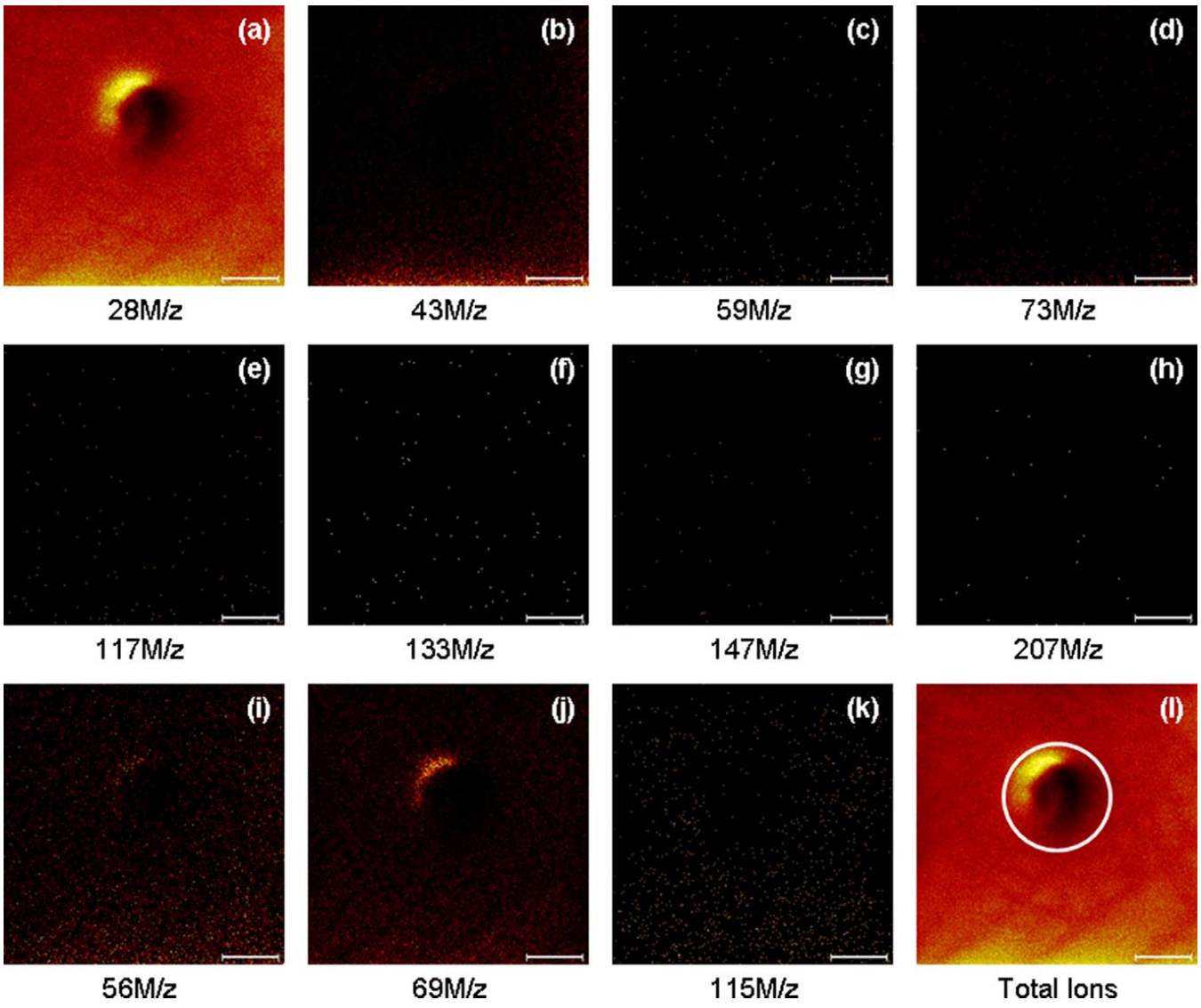


Figure S2. AFM images of channels patterned on L-PDMS with 15 kV **(a)** and 30 kV **(b)** accelerating voltages. The exposure dosage was held constant at 2010 μC/cm^2. **(c)** Channels patterned at 15 kV are narrower and shallower than the channels patterned at 30 kV.



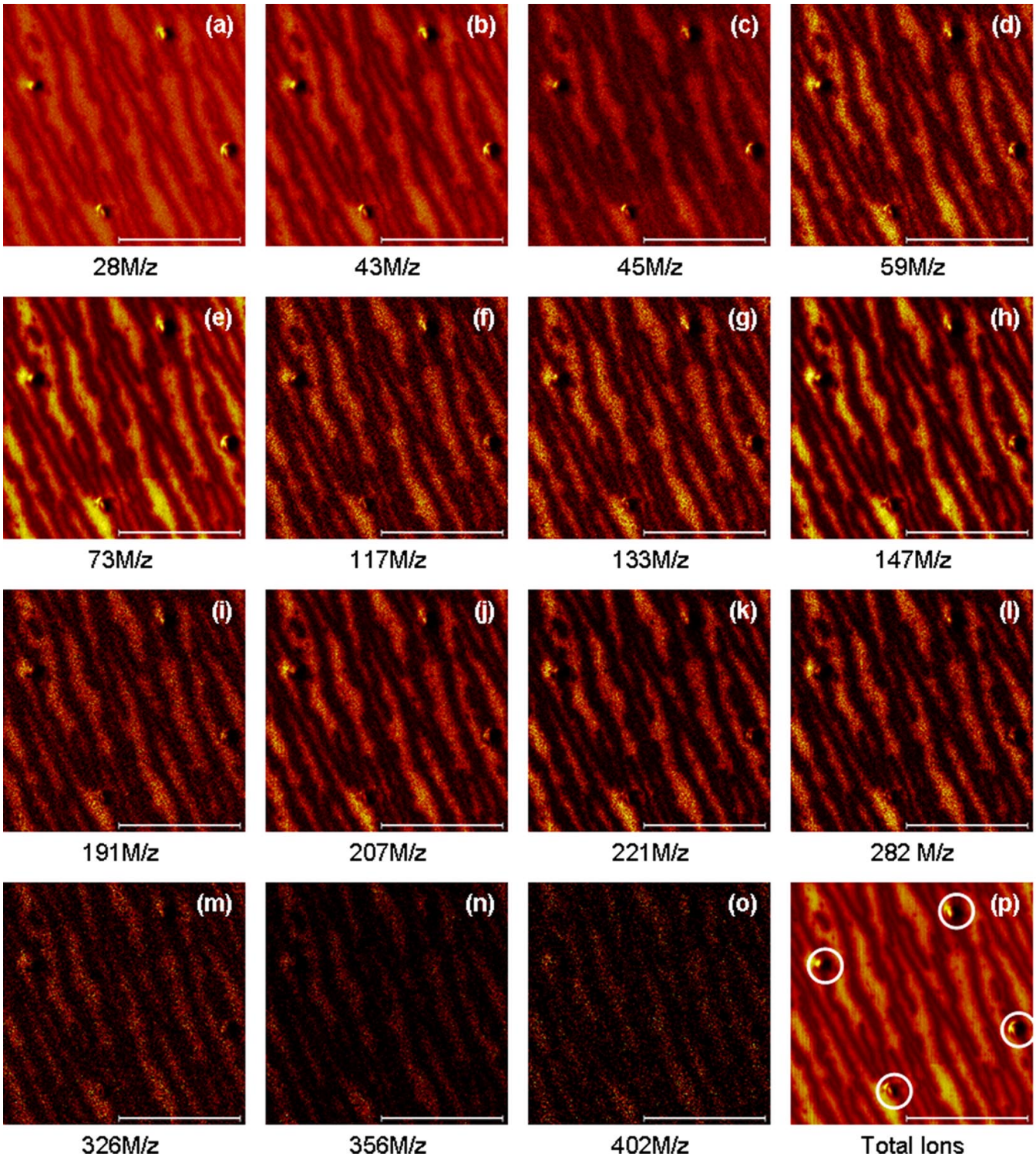
2. Complete ToF-SIMS Spectra of L-PDMS Without Au Coating

Figure S3. Complete ToF-SIMS spatial distribution maps for patterned L-PDMS *without* Au coating. The patterned feature is circled in **(l)**. (**a-h**) are known PDMS fragments and (**i-k**) correspond to unknown fragments. The scale bar is 10 μm.



3. Complete ToF-SIMS Spectra of L-PDMS With Au Coating: PDMS Peaks

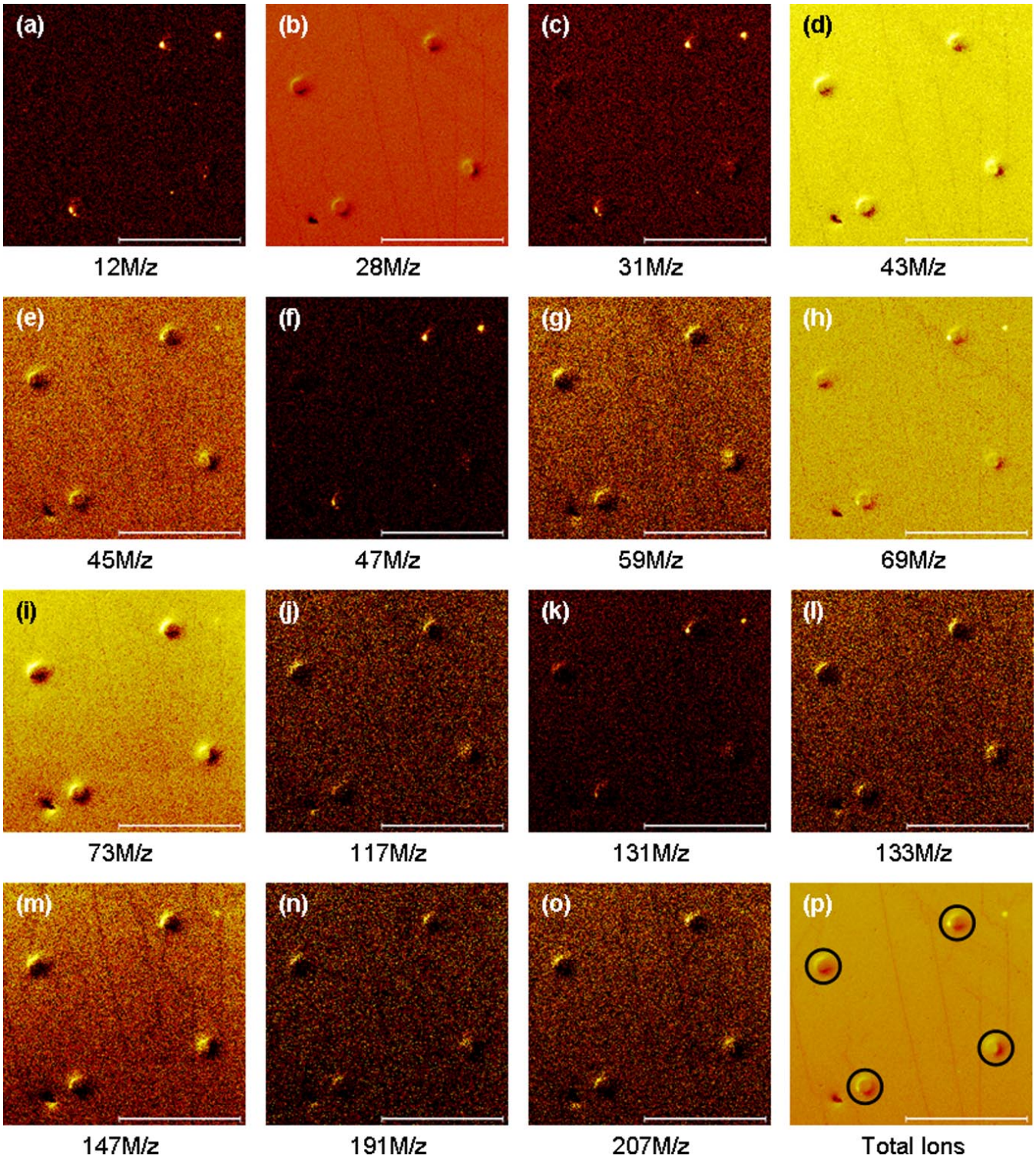
Figure S4. Complete ToF-SIMS spatial distribution maps for patterned (5 μm x 5 μm boxes) L-PDMS *with* Au coating. The patterned features are circled in (**p**). (**a-o**) are all known PDMS fragments. The scale bar is 100 μm.



4. Complete ToF-SIMS Spectra of SAM-Coated L-PDMS Reacted With APTS

Figure S5. Complete ToF-SIMS spatial distribution maps for patterned (5 μm x 5 μm boxes) SAM-coated L-PDMS reacted with APTS. The patterned features are circled in (**p**). (**b, d, e, g, i, j, l, m, n, o**) are known PDMS fragments and (**a, c, f, k**) are known SAM fragments. No APTS

fragments were detected. The peak at 69 (**h**) could be due to the CF_3^+ or $^{69}Ga^+$ ion. The scale bar is 100 μm.



5. Optical Images of Soft-Contact Optical Lithography Study

Figure S6. Optical images of patterned photoresist at varying exposures. The L-PDMS stamp is shown in the lower right image. The pattern written into the L-PDMS stamp by EBL is a string of five circles lying on a line. The scale bar is 25 μm.

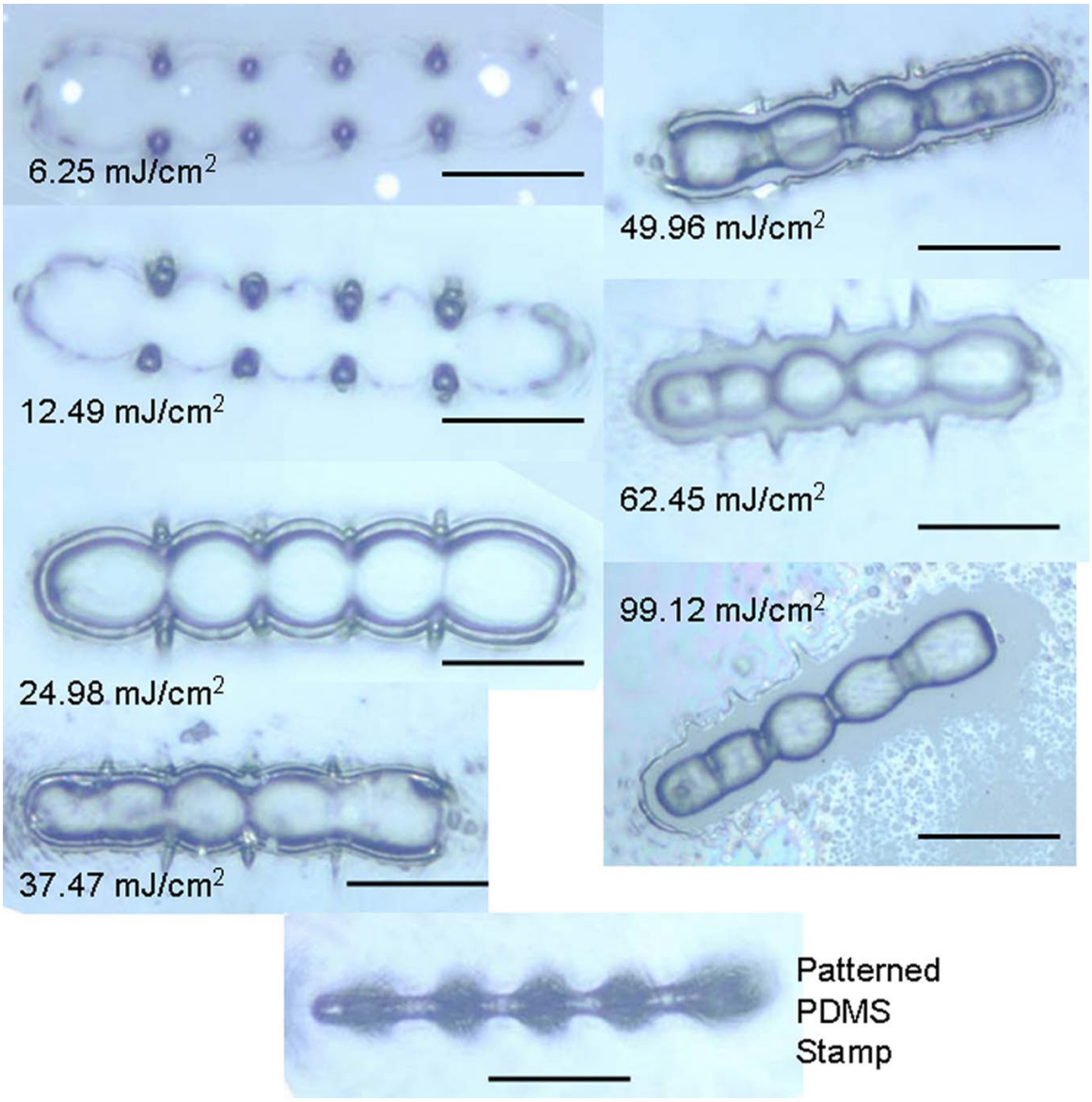
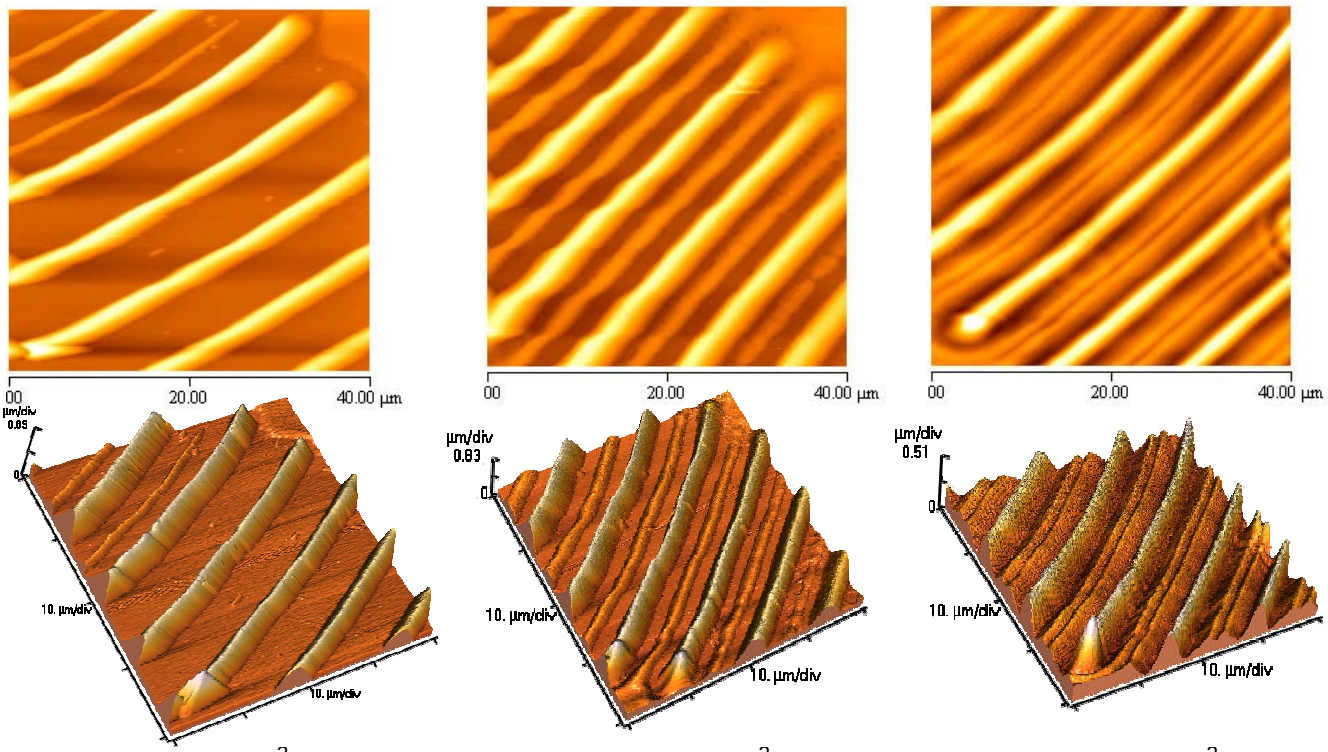


Figure S7. AFM images of patterned photoresist with various exposures and stamp channel dimensions. The exposure listed in mJ/cm^2 is the photolithographic exposure, while the number listed in μC/cm^2 is the EBL exposure dosage used to pattern the stamp. The pattern written into the L-PDMS stamp by EBL is a series of evenly spaced lines.

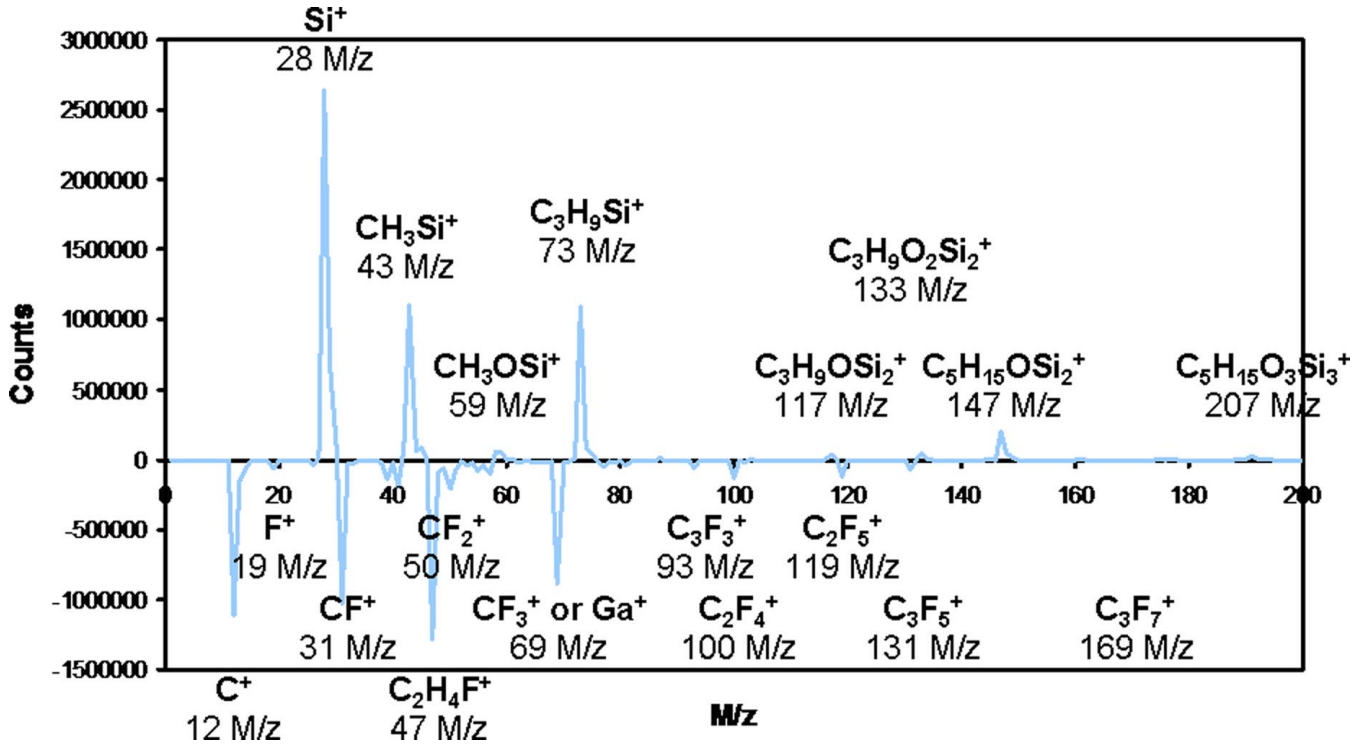


41.2 mJ/cm^2 | 33.7 mJ/cm^2 | 33.7 mJ/cm^2

4030 μC/cm^2 Lines | 5030 μC/cm^2 Lines | 10100 μC/cm^2 Lines

6. Additional ToF-SIMS Spectra of SAM-Coated L-PDMS

Figure S8. L-PDMS ToF-SIMS spectra subtracted from the SAM-coated L-PDMS ToF-SIMS spectra. The peaks on the top half are unique to L-PDMS, while the peaks on the bottom half are unique to SAM-coated L-PDMS. The peak at 69 could be due to the CF_3^+ or $^{69}Ga^+$ ion.



7. TGA's of L-PDMS and H-PDMS

Figure S9. L-PDMS TGA.

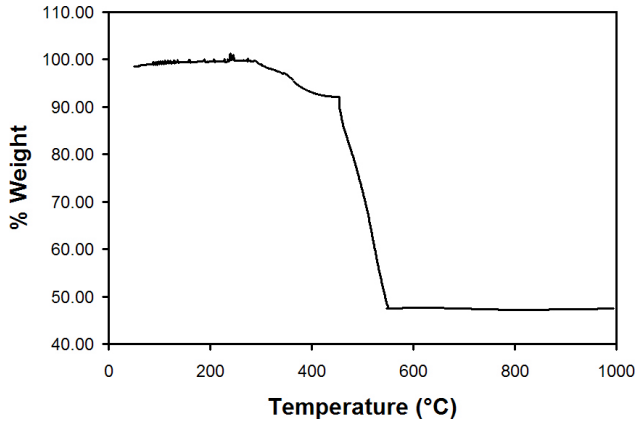
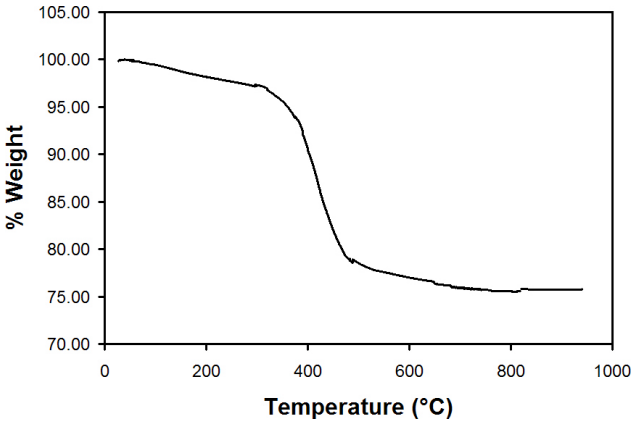


Figure S10. H-PDMS TGA.



8. AFM Line Scans for Time-Resolved Study

Figure S11. AFM scans **(a)** immediately after EBL patterning and **(b)** 250 hours later. **(c)** Line scans reveal that some changes do occur over time.