Electronic Supplementary Material (ESI) for Lab on a Chip.

A Flexible 3-Dimensional Microelectrode Array for In Vitro Brain Models

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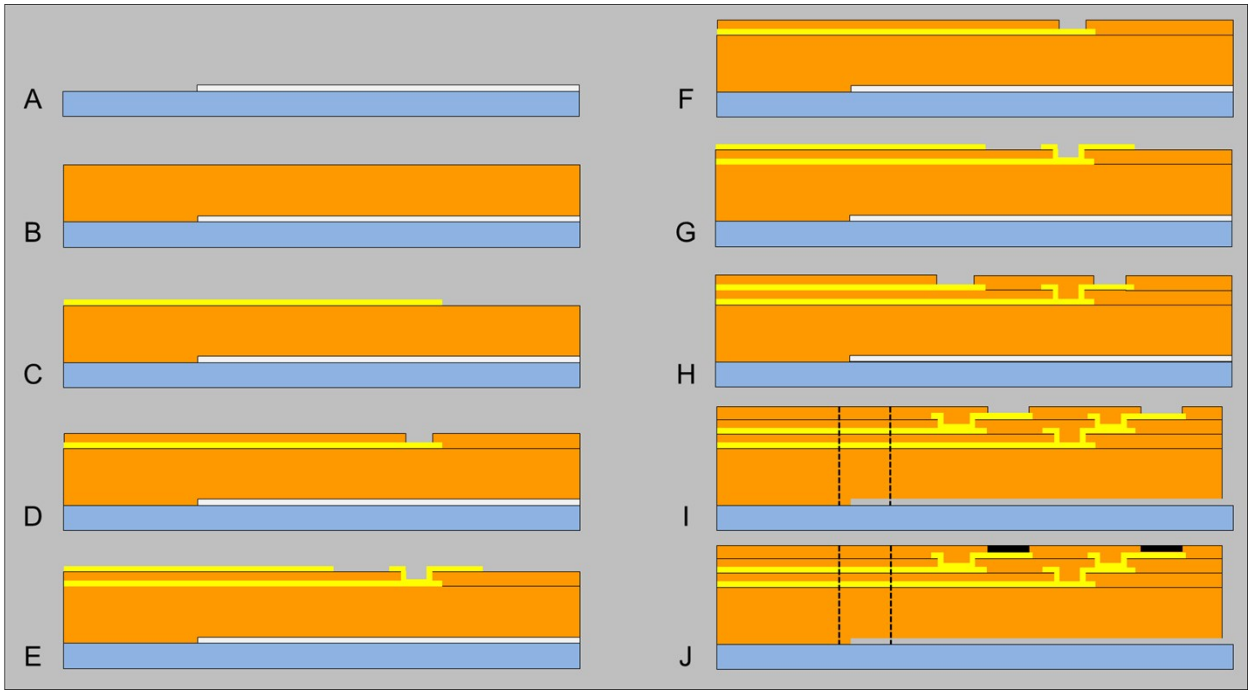
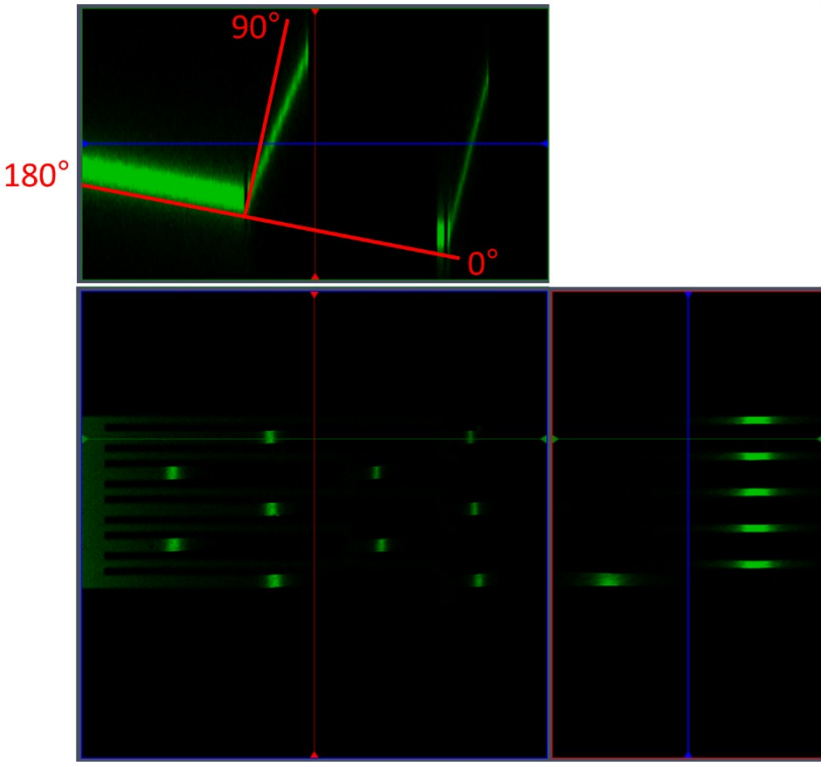
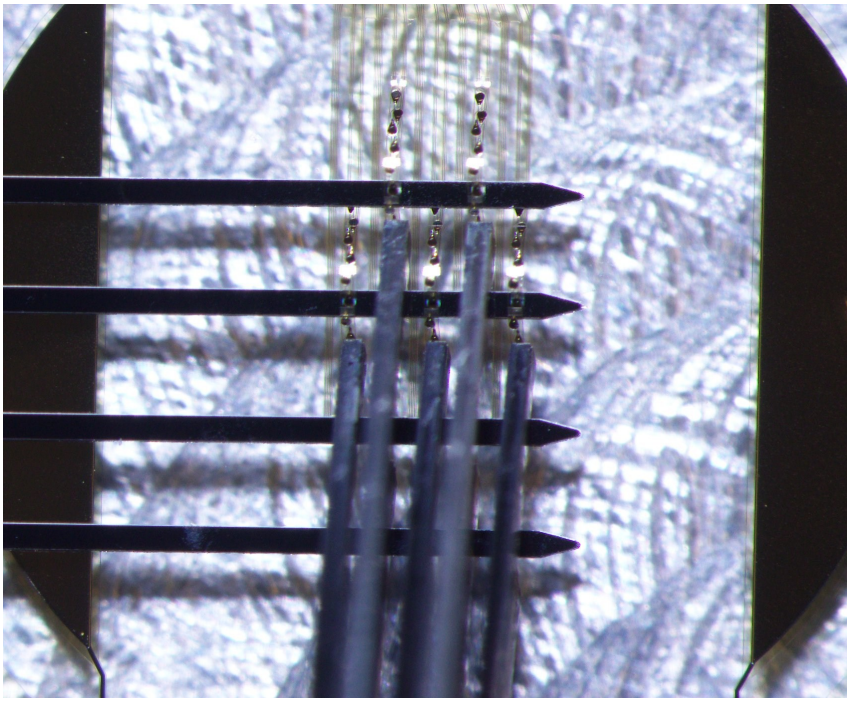
Supplementary Information



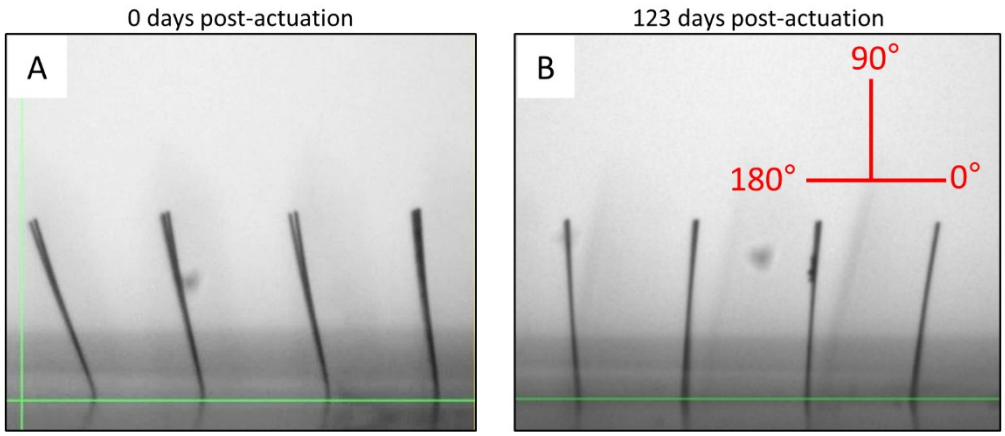
Supplementary Figure 1: Cross-sectional process flow for microfabrication of 3DMEA probes prior to actuation. A) Chrome release layer is deposited and patterned on glass wafer. B) First polyimide layer is deposited. C) First trace metal layer is deposited and patterned. D) Second polyimide layer is deposited and interconnection vias are etched down to the first metal layer. E) Second trace metal layer is deposited and patterned. F) Third polyimide layer is deposited and second interconnection via layer is etched down to the second metal layer. G) Electrode metal layer is deposited and patterned. H) Forth polyimide layer is deposited, then connection pad, electrode vias and device outlines are etched into the polyimide. I) Chrome release layer is etched. J) Electrodes are electroplated with platinum black.



Supplementary Figure 2: Actuation angle quantification using fluorescence confocal microscope images. Devices are tilted slightly on the microscope stage to increase contrast in actuated probe regions. Angle measurements are quantified using ImageJ.



Supplementary Figure 3: Actuation process showing probe buckling step and subsequent lifting shank positioning under buckled probes.



Supplementary Figure 4: Goniometer side-view images of 3D probe array immediately following actuation and 123 days post-actuation.