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Long Chain DNA Separation in a Sparse Nanopost Array JIA OU[1], MARK JOSWIAK, KEVIN DORFMAN, Chemical Engineering and Materials Science, University of Minnesota — Long chain DNA separation is a challenge for gel lectrophoresis. Our previous DNA separation experiments and simulations demonstrated that a sparse micro post array can separate large DNA. However, the smaller DNA are not well resolved. We hypothesized that smaller posts will increase the collision frequency of the smaller DNA and thus the resolution. We successfully fabricated a hexagonal array of 350 nm diameter posts with a 3 μm spacing using an oxygen plasma etching method. Under an electric field of 10 V/cm, the mobilities of different species ranging from 10-48.5 kilobasepair (kbp) were normalized by the mobility of λ DNA (48.5 kbp), which was included in all experiments as a standard to correct for day-to-day variations in electroosmotic flow. The resolution of these DNA is markedly improved when compared with a 1 μm diameter micropost array. We demonstrate the robustness of the device by using the calibration curve to identify the peaks in a separation of the λ DNA-Mono Cut mix.

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