

Polyelectrolyte Multilayer-Assisted Fabrication of Non-Periodic Silicon Nanocolumn Substrates for Cellular Interface Application

Seyeong Lee,^{‡a} Dongyoon Kim,^{‡a} Seong-Min Kim,^a Jeong-Ah Kim,^a Taesoo Kim,^a Dong-Yu Kim,^{a,b} Myung-Han Yoon^{*a,b}

^a School of Materials Science and Engineering, Gwangju Institute of Science and Technology, 123 Cheomdan-gwagiro, Buk-gu, Gwangju 500-712, Republic of Korea.
E-mail: mhyoon@gist.ac.kr

^b Research Institute for Solar and Sustainable Energies, Gwangju Institute of Science and Technology, 123 Cheomdan-gwagiro, Buk-gu, Gwangju 500-712, Republic of Korea

Supporting information

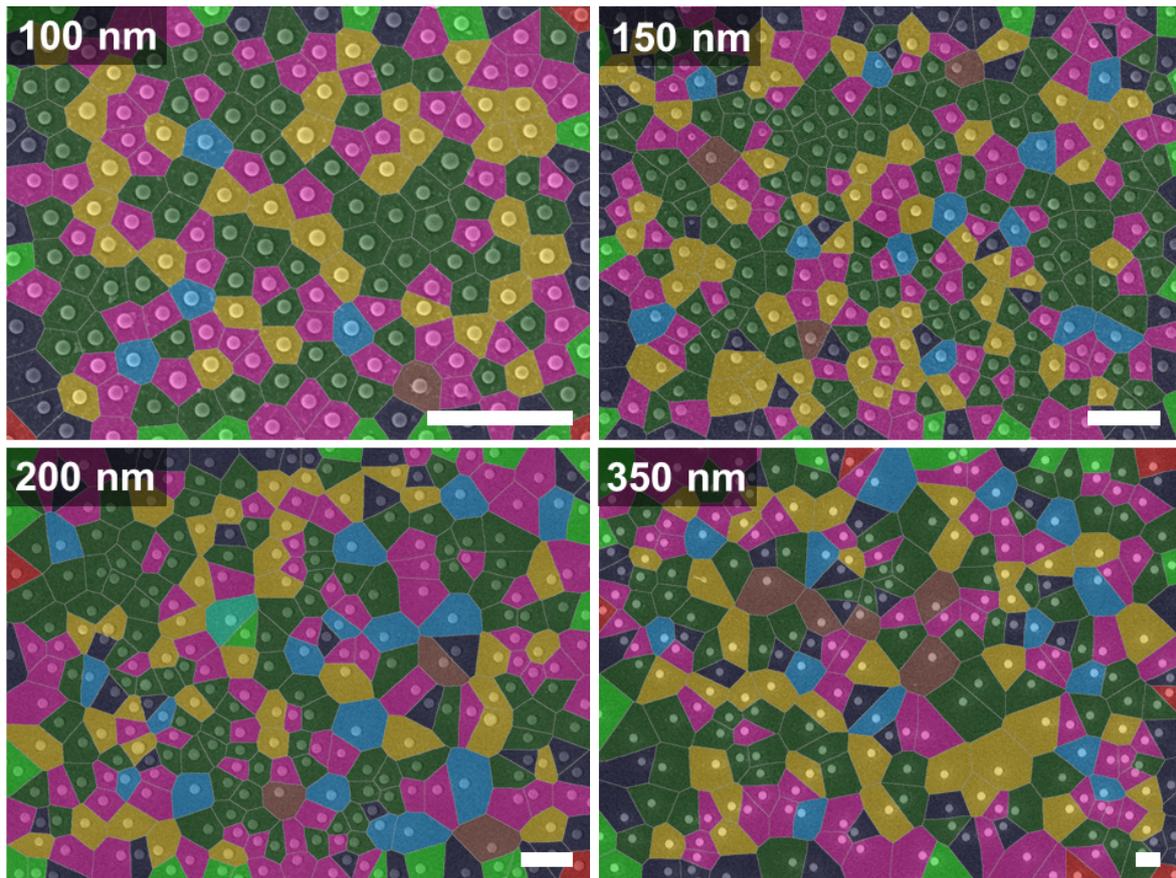


Fig. S1 Voronoi diagram of PS nanosphere with different sizes on 5 layer polyelectrolyte multilayers. The distribution of nanosphere was analyzed by Voronoi area. The different colors were coded by coordination number of nearest neighbours. (all scale bar: 1 μm)

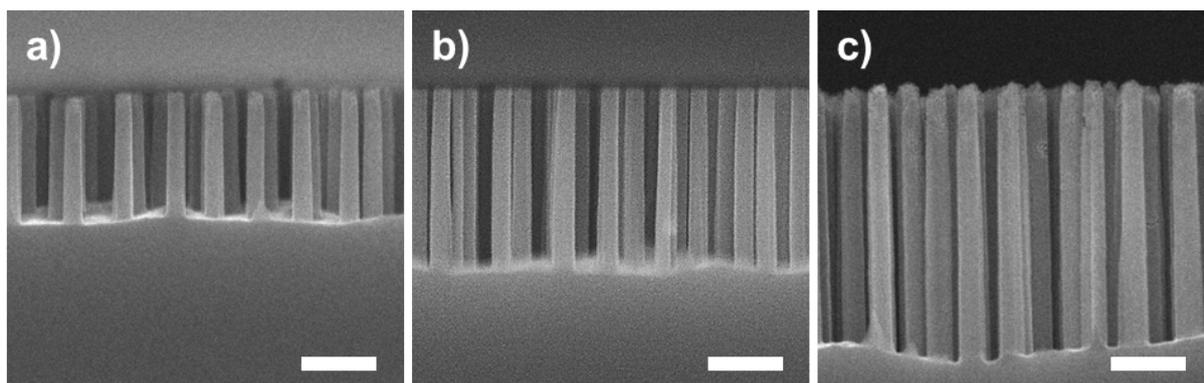


Fig. S2 Cross-sectional SEM images of vSNAs etched for a) 1 min, b) 2 min, and c) 3 min, respectively. (all scale bars: 1 μm)

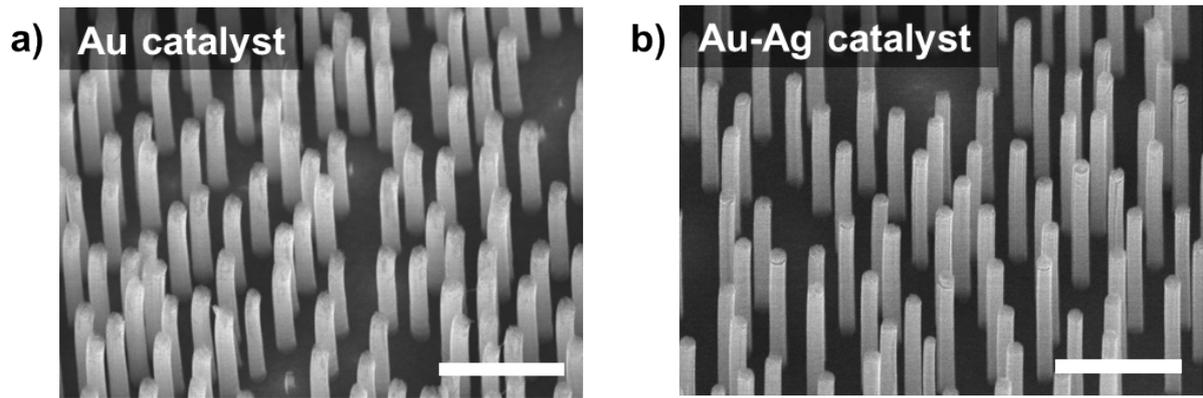


Fig. S3 SEM images of vSNAs fabricated using a) Au film and b) Au-Ag bilayer film as catalyst. The concentration of etching solution depends on the metal catalyst. Compared to the Ag film, both of Au and Au-Ag bilayer have sufficient stability in etching solution. (all scale bar: 1 μm)

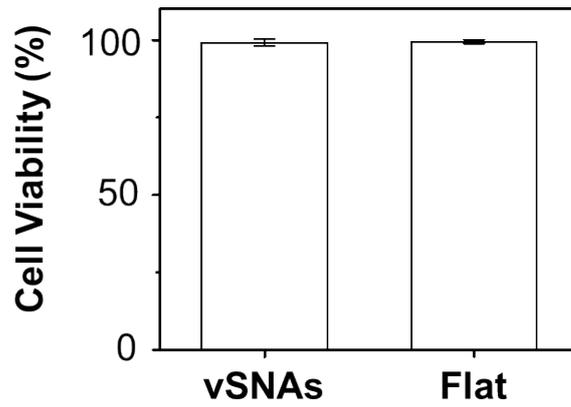


Fig. S4 Cell viability plots of fibroblast cultured on vSNA and flat substrates after 24 hours. Error bars denote standard deviation. Then, the cell viability statistics obtained by monitoring >200 cells on both vSNA and flat silicon substrates (>5 samples for each) show close to 100% viability with very low standard deviation.

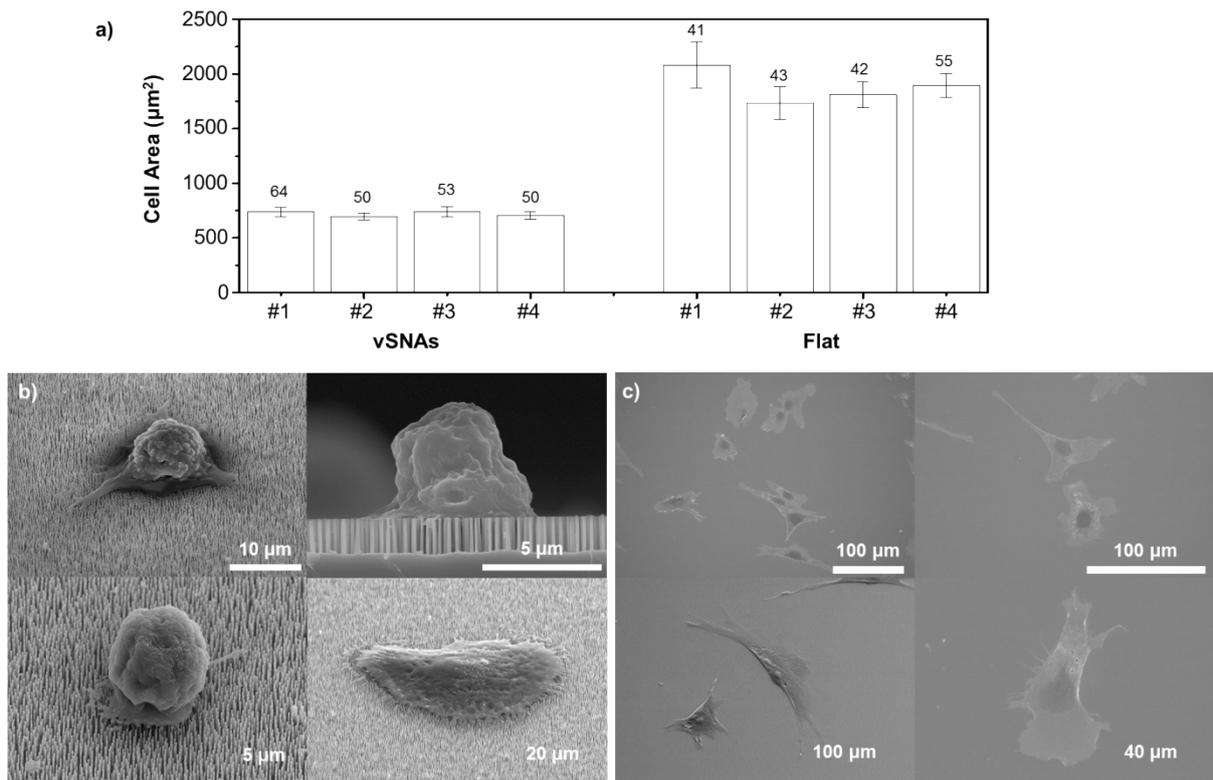


Fig. S5 a) The statistics of cell spreading area of fibroblast cultured on 4 different substrates at each substrate condition (vSNAs or Flat). The number and error bar at each histogram bar denote the cell count used for cell area calculation and standard deviation of cell area, respectively. A series of SEM images showing spherical morphology of fibroblast on b) vSNA and c) flat silicon substrates.

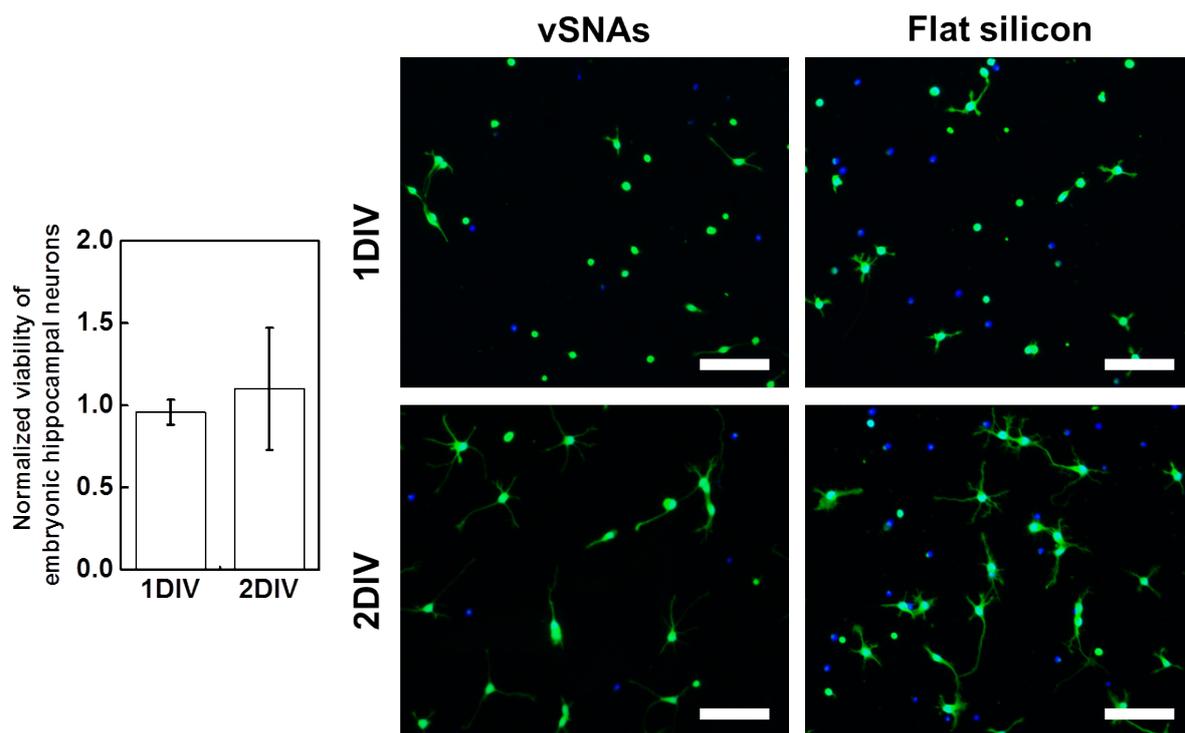


Fig. S6 Dissociated hippocampal neurons cultured on flat and vSNAs. Fluorescence images show neurons viability at 1DIV and 2DIV. Living cell are stained green, whole cells blue. Error bars indicate standard deviation from the number of samples 4. (all scale bars: 100 μ m)