

Protein-Substrate Adhesion in Microcontact Printing

Regulates Cell Behaviors

Shuhuan Hu^{a*}, Ting-Hsuan Chen^{ab}, Yanhua Zhao^a, Zuankai Wang^{ab} and Raymond H.W. Lam^{ab*}

^a Department of Mechanical and Biomedical Engineering, City University of Hong Kong, Hong Kong;

^b City University of Hong Kong Shenzhen Research Institute, Shenzhen, China;

* Correspondence should be addressed to S Hu (email: shuhuanhu2-c@my.cityu.edu.hk; Tel: +852-3442-7174) or RHW Lam (email: rhwlam@cityu.edu.hk; Tel: +852-3442-8577; Fax: +852-3442-0172).

Supplemental Figures

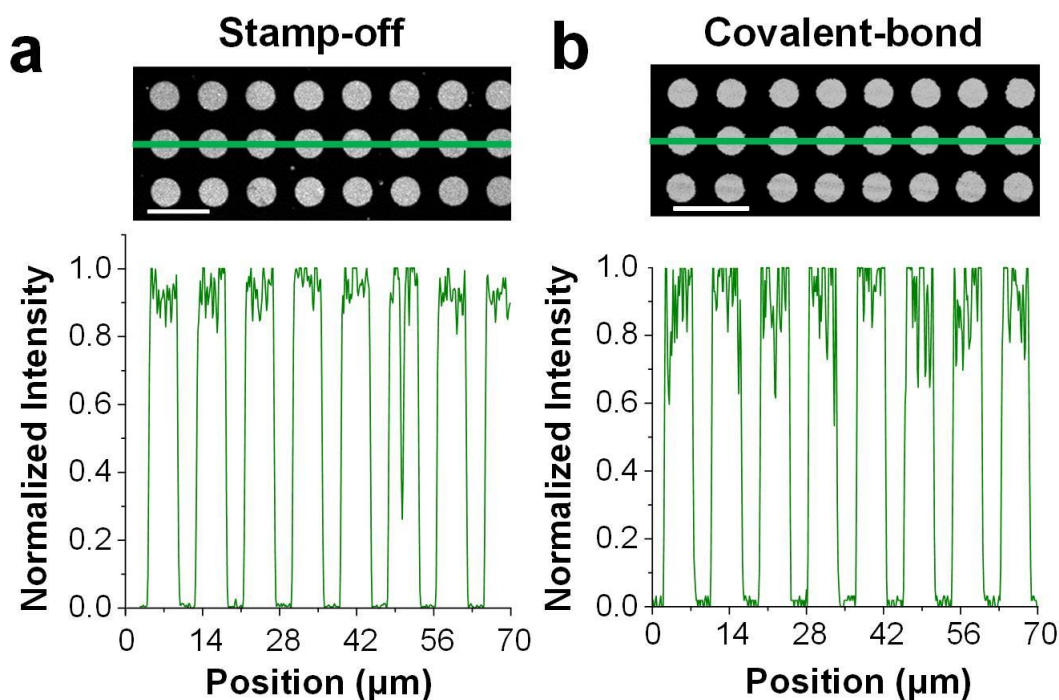


Figure S1. Quality of the μ CP created patterns. High contrasts of the fluorescent brightness among the patterned areas and uncoated areas indicate the good quality of the created patterns for (a) stamp-off and (b) covalent-bond methods. Scale bar: 10 μm .

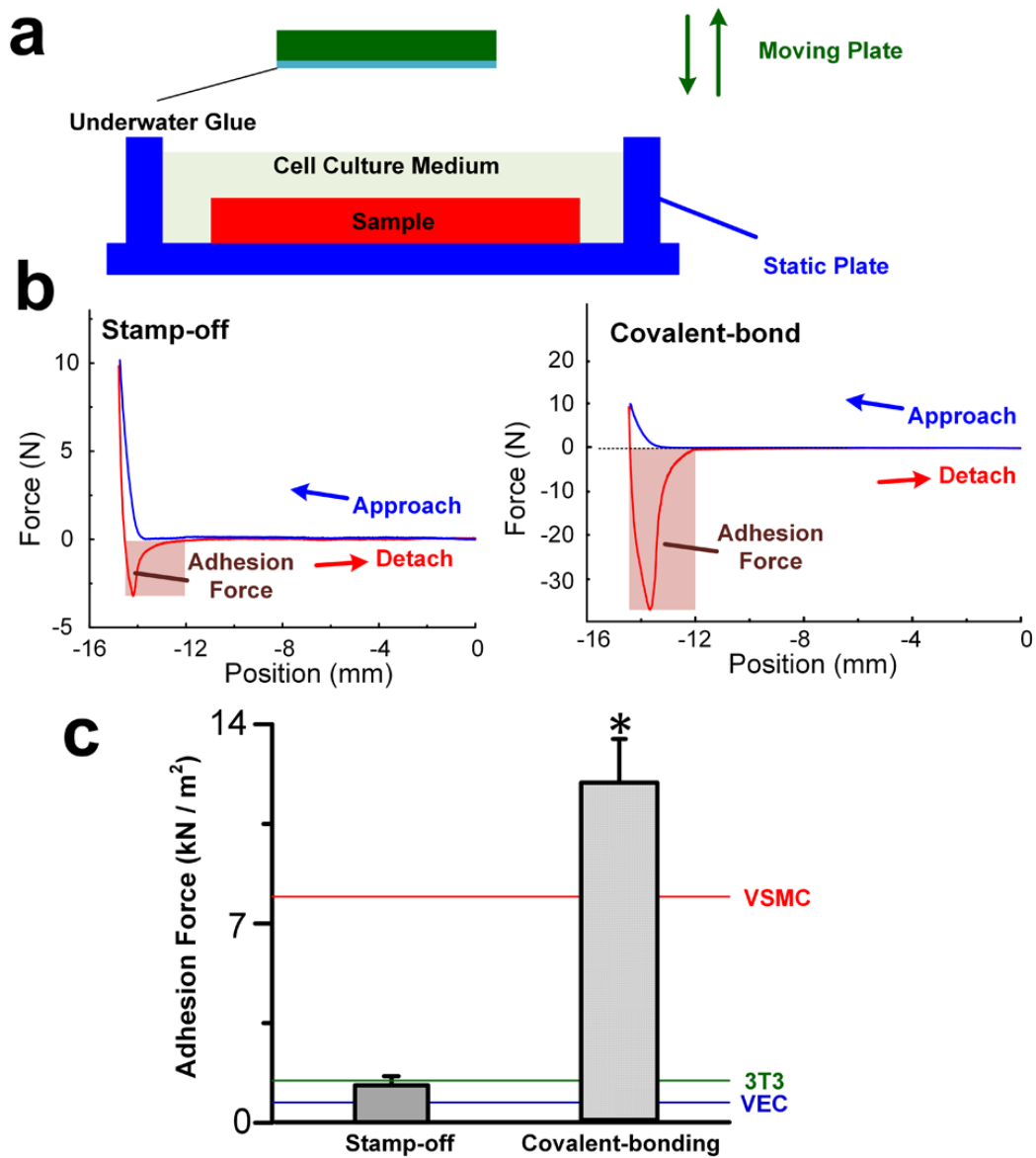


Figure S2. Measurement of the adhesion force between the ECM protein and the substrates. **(a)** Set-up of the measurement. **(b)** Representative force-displacement curves for the measurements of the substrates coated by the stamp-off method and the covalent-bond method. **(c)** The adhesion force of protein coating by the stamp-off method and the covalent-bond method.

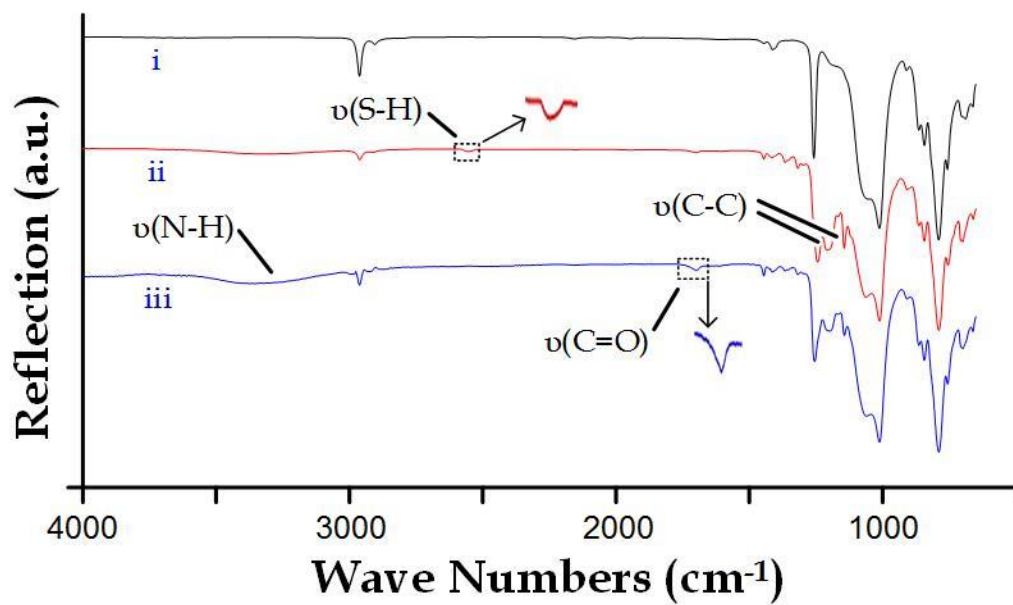


Figure S3. ATR-FTIR spectra at the key micropatterning steps. $\nu(\text{S-H})$ and $\nu(\text{C-C})$ adsorptions indicate the conjugation of MTPMS; $\nu(\text{N-H})$ and $\nu(\text{C=O})$ adsorption indicates the conjugation of GMBS.

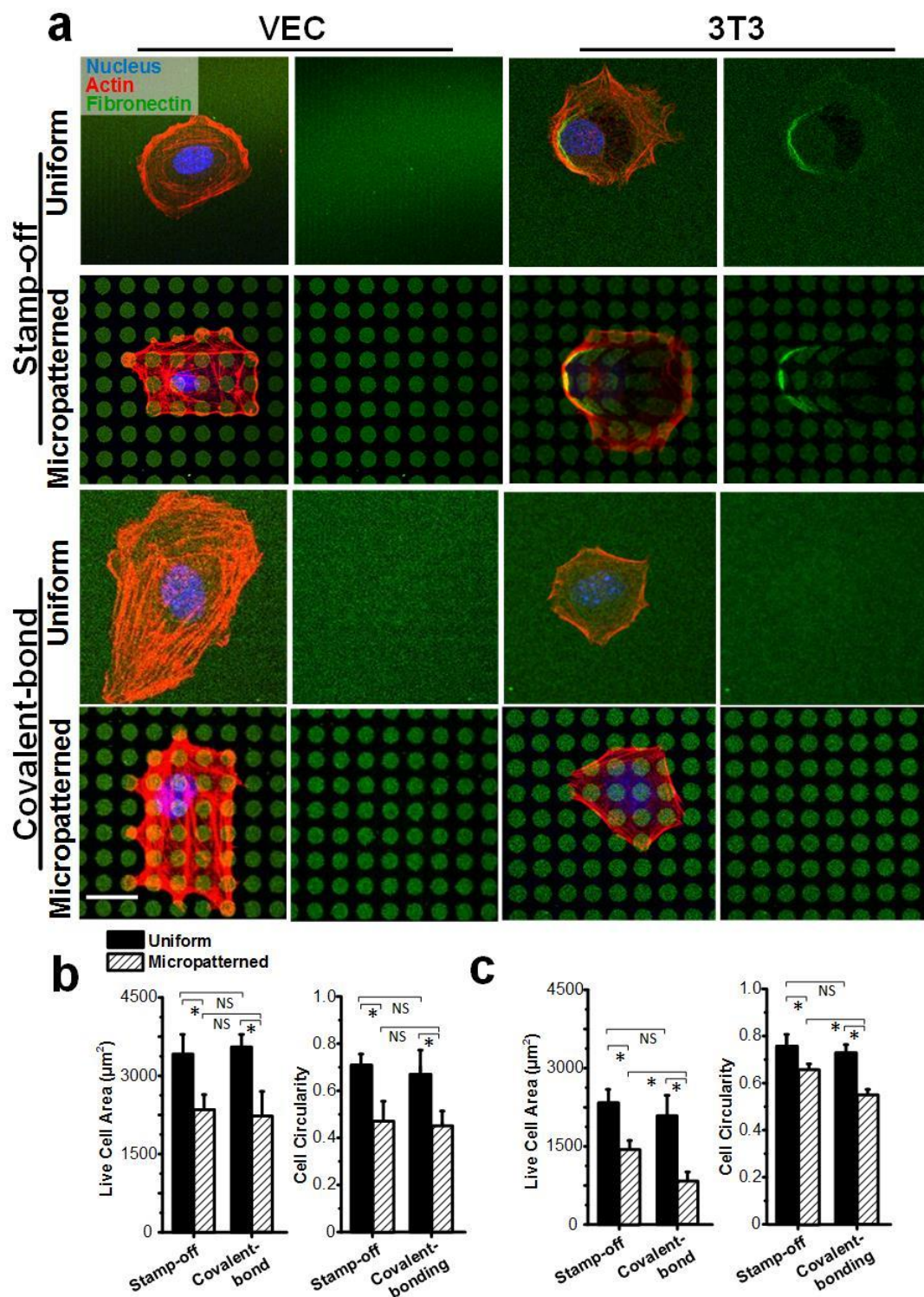


Figure S4. Micrographs (a) and morphological statistics of (b) VECs and (c) 3T3 cells seeded on the substrates coated by the stamp-off method and the covalent-bond method. NS stands for no significance. Scale bar: 20 μm .

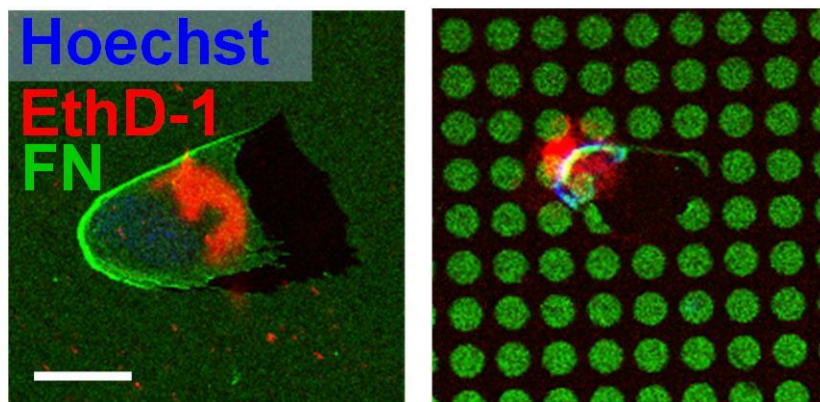


Figure S5. Correlations between the ECM protein delamination of the cell death for 3T3 cells. The red colour indicates the EthD-1 dye entered a dead cell. Scale bar: 20 μm .

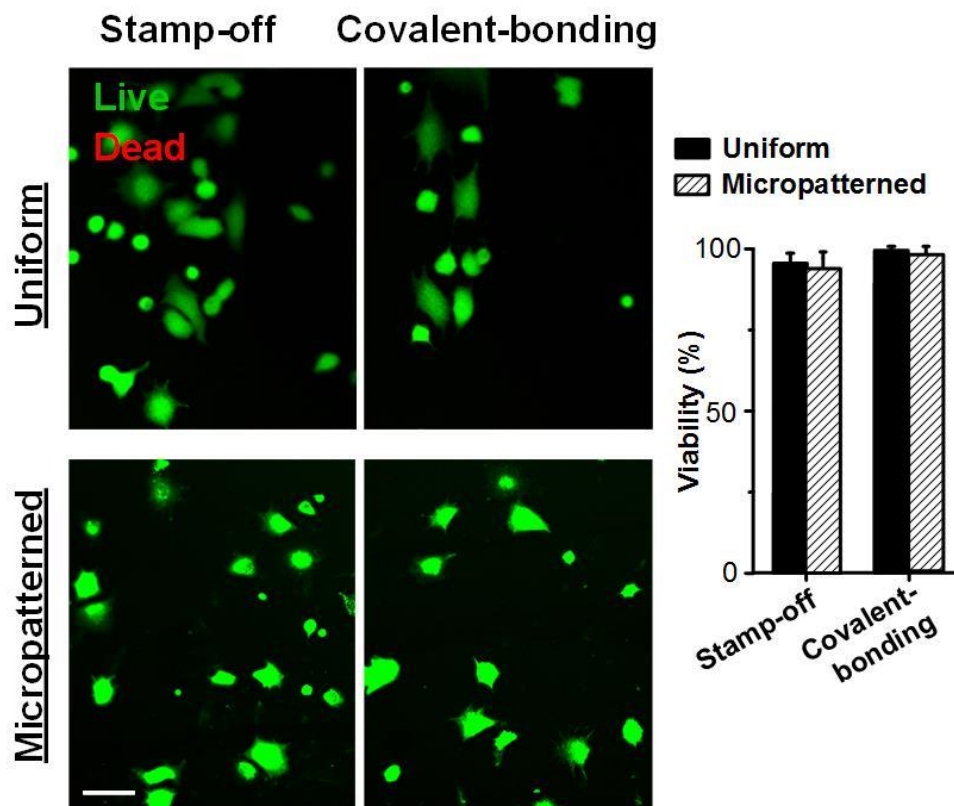


Figure S6. VMSCs viability was significantly improved (>90%) after treated with 50 μ M blebbistatin on the stamp-off and covalent-bonding surfaces. Scale bar: 50 μ m.