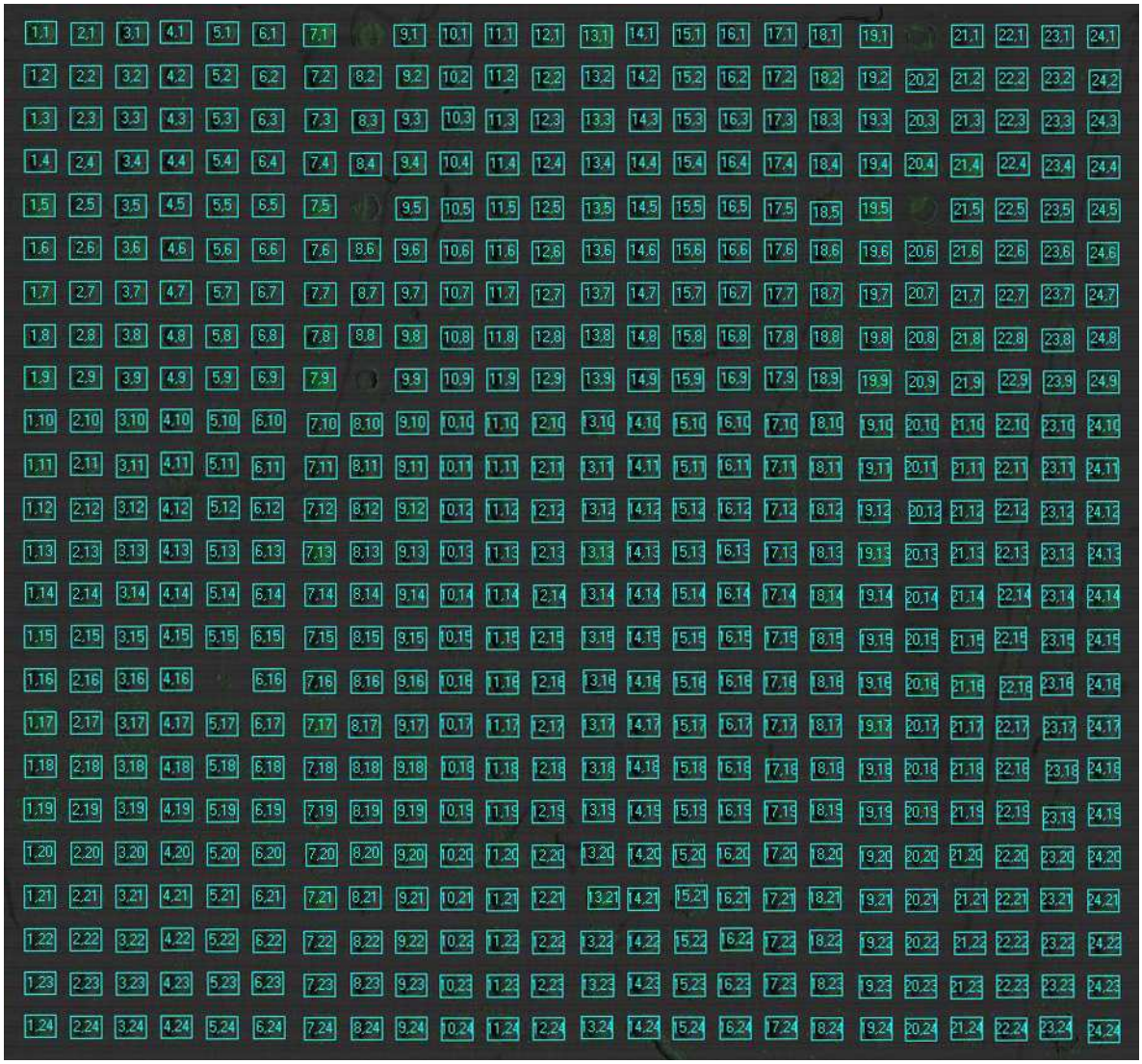
DOI: 10.1002/adma.200803184

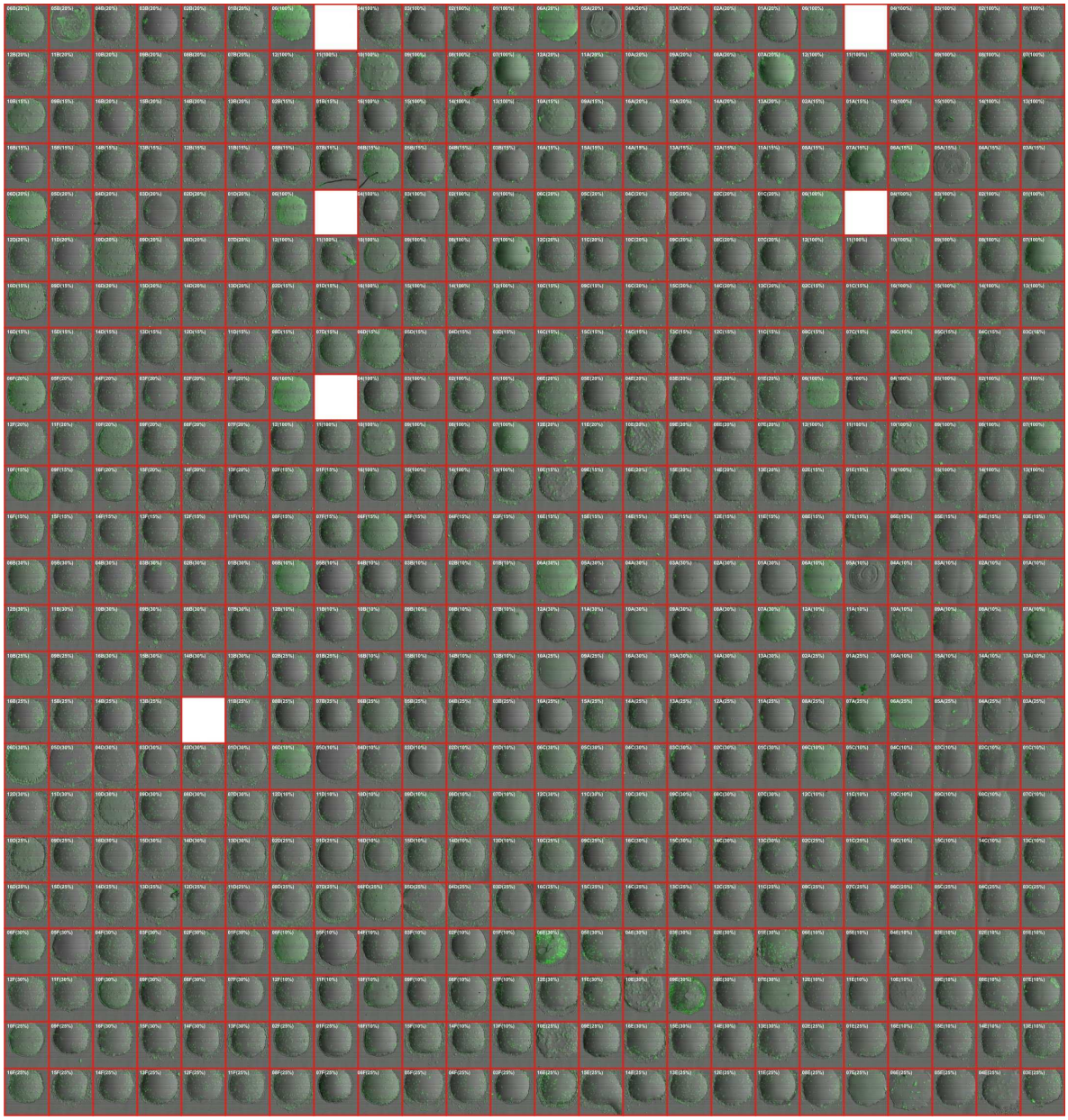
Mapping the Interactions among Biomaterials, Adsorbed Proteins, and Human Embryonic Stem Cells

By *Ying Mei, Sharon Gerecht, Michael Taylor, Andrew J. Urquhart, Said R. Bogatyrev, Seung-Woo Cho, Martyn C. Davies, Morgan R. Alexander, Robert S. Langer,* and *Daniel G. Anderson**

Dr. D. G. Anderson
David H. Koch Institute for Integrative Cancer Research
Massachusetts Institute of Technology
45 Carleton Street, Building E25-342
Cambridge, MA 02142 (USA)
E-mail: dgander@mit.edu
Dr. Y. Mei, S. R. Bogatyrev, Dr. S.-W. Cho, Prof. R. S. Langer
Department of Chemical Engineering
Massachusetts Institute of Technology
77 Massachusetts Avenue
Cambridge, MA 02139 (USA)
Prof. S. Gerecht
Department of Chemical and Bimolecular Engineering
Johns Hopkins University
Baltimore, MD 21218 (USA)
Dr. M. Taylor, Dr. A. J. Urquhart, Prof. M. C. Davies, Prof. M. R. Alexander
Laboratory of Biophysics and Surface Analysis
School of Pharmacy
The University of Nottingham
Nottingham, NG7 2RD (UK)



Supplementary Figure 1: The low resolution scan allows for the identification of the polymer spots on the glass slide.



Supplementary Figure 2: The high resolution scan allows us to quantify the cellular response on each polymer spot.

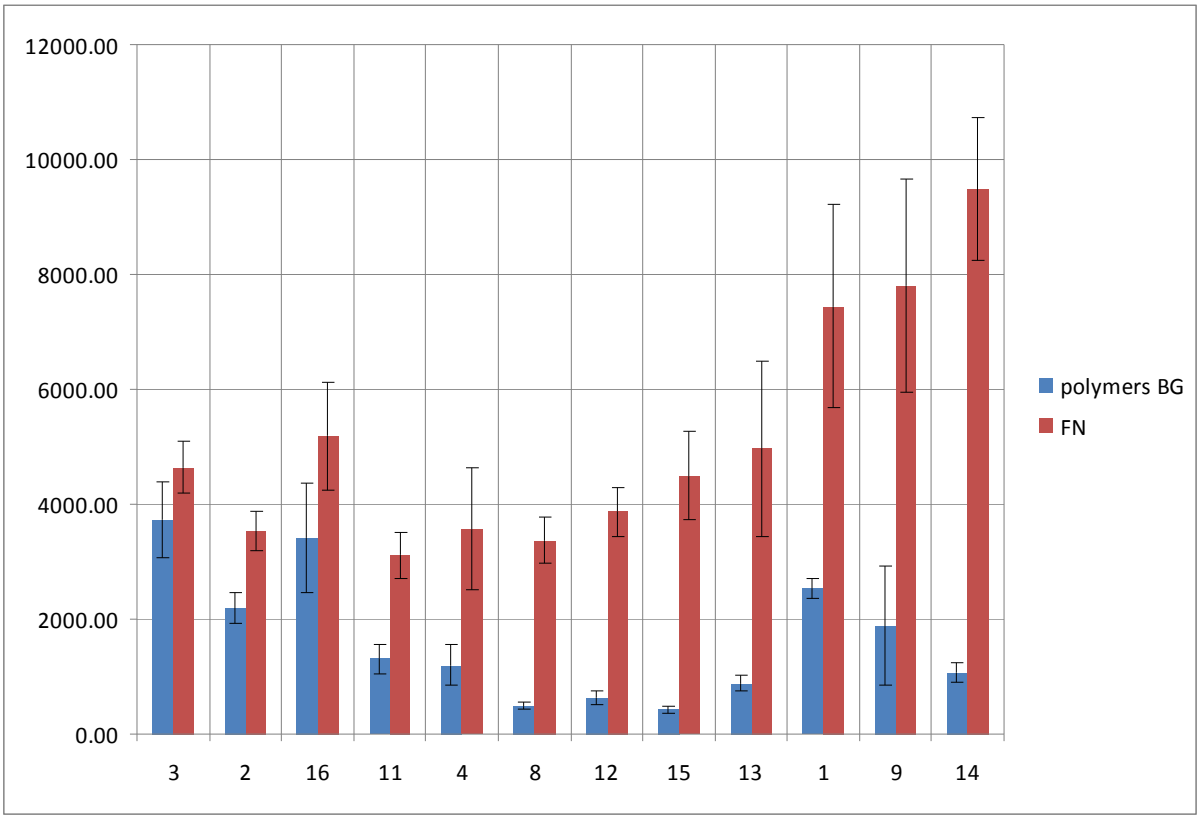


Figure 3. The fluorescence intensity of all the homopolymer spots (18 replicates) listed in the Figure 2b before (blue) and after (red) fluorescently labeled Fn adsorption. Paired t-test confirmed the significant difference ($P<0.001$) between before and after Fn adsorption in all the cases including hompolymer 3 and 16. The fact that there are 18 replicates for each homopolymer significantly

To assess the relationships between cell numbers and adsorbed Fn in a statistically relevant manner, the data in the Figure 2c has been fitted in a sigmoid curve (Equation 1) by using a commercially available software (Origin), and the goodness of the fit (R^2) was listed in the Table 1.

The relatively high R^2 values (0.8~0.9) found in most of the major monomers indicated a high degree of correlation. For "high adhesion" major monomers such as monomer 4, 8, 13, 14 and 15 only the saturated cell attachment has been observed, and the curves have been manually drawn to guide the reader's eyes.

$$Y=A_2+(A_1-A_2)/(1+\exp((x-x_0)/dx) \quad (1)$$

Here Y is the cell number on the polymer spot, A_1 and A_2 are background and saturated cell numbers on the polymer spots, respectively. x_0 is the Fn density where the transition takes place, and dx is the slope of the sigmoid function.

Table 1. The goodness of fit (R^2) calculated from curve fitting the data in Figure 2C

Major Monomer (R^2)	1 (0.87)	2 (0.89)	3 (0.79)	9 (0.99)	11 (0.94)	12 (0.80)	16 (0.88)

[a]: The first number is the ID of the major monomer while the number in the bracket is the R2 value calculated from curve fitting the data in Figure 2C