Electronic Supplementary Information

Tailoring cellular microenvironments using scaffolds based on magnetically-responsive polymer brushes

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1. **AFM topography images of poly(APTAC) and poly(APTAC)+SPIONs brushes coated with PLL in water, before and after applying neodymium magnet.**

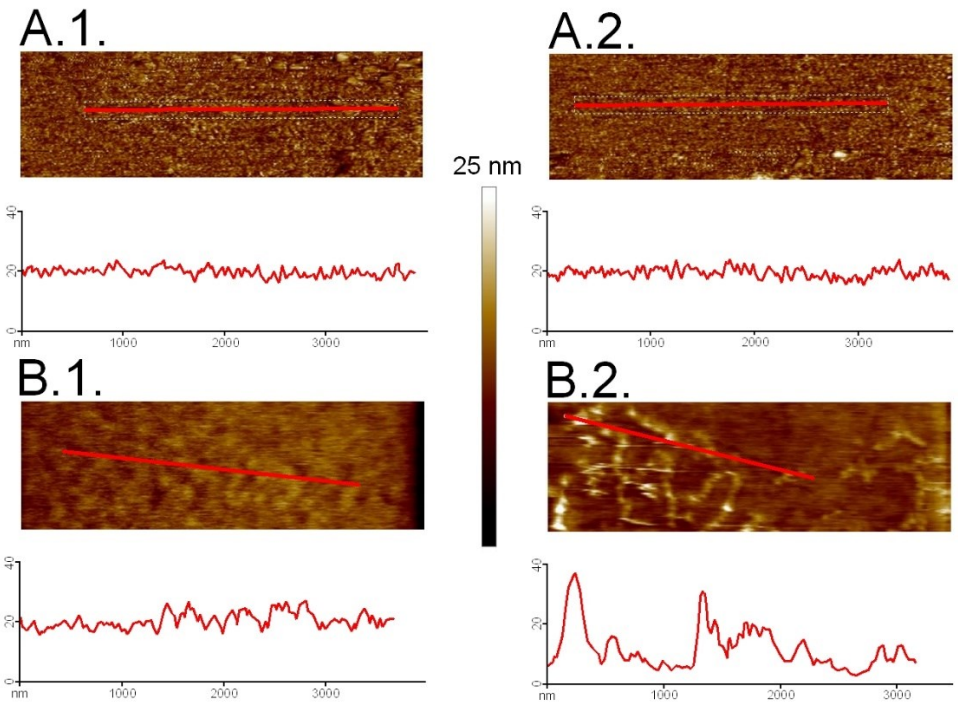

Figure S1. AFM topography images in water of poly(APTAC) brushes coated with PLL before (A.1.) and after (A.2.) 24 h in the magnetic field and poly(APTAC)+SPIONs brushes coated with PLL before (B.1.) and after (B.2.) 24 h in the magnetic field.

2. **AFM cross-sections of poly(APTAC) and poly(APTAC)+SPIONs brushes coated with PLL in water, before and after applying neodymium magnet.**

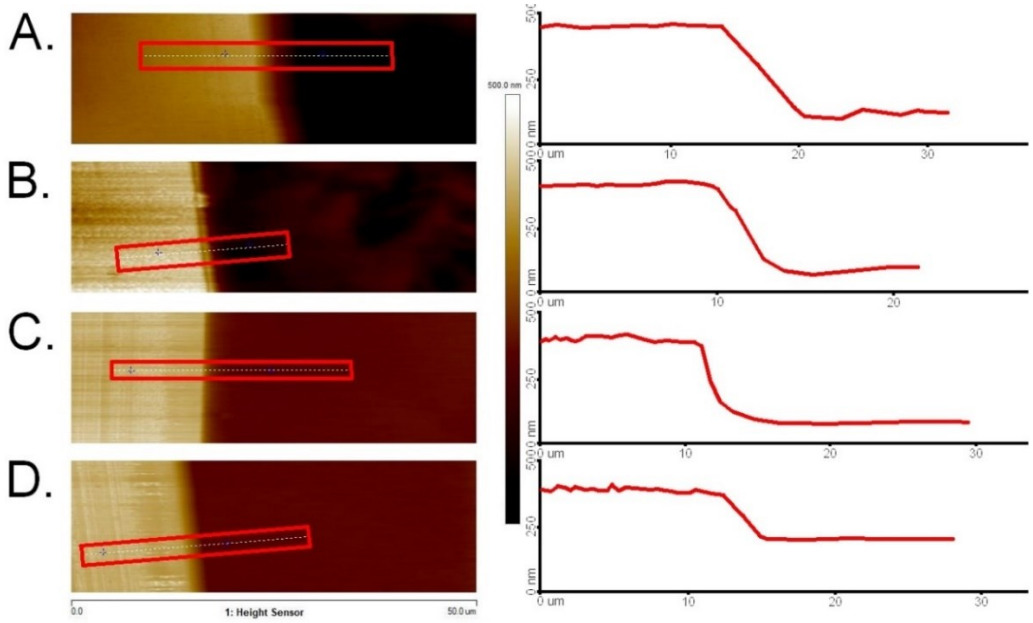

Figure S2. AFM images in water with corresponding cross-sections of poly(APTAC) brushes coated with PLL before (A.) and after (B.) 24 h in the magnetic field and poly(APTAC)+SPIONs brushes coated with PLL before (C.) and after (D.) 24 h in the magnetic field.

3. Homogeneous distribution of SPIONs in the poly(APTAC) brushes.

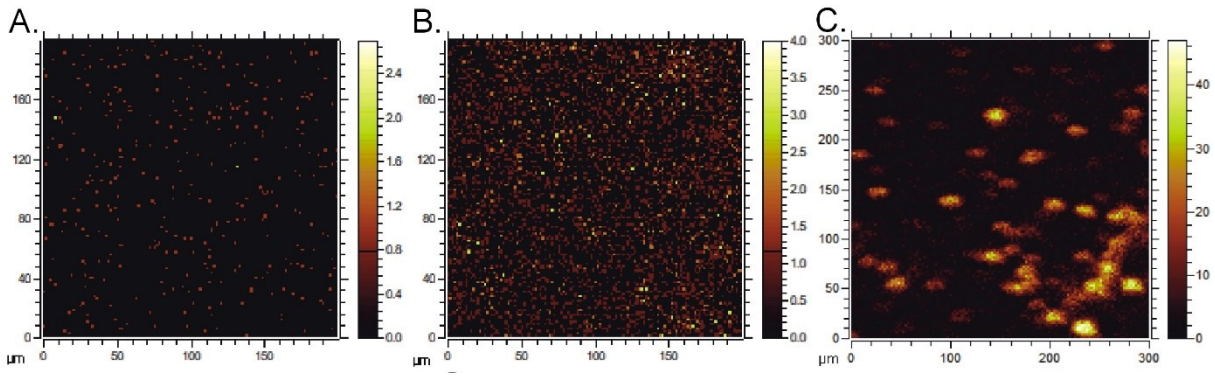

Figure S3. SIMS **i**ron depth profiles projected onto the XY plane for: A. poly(APTAC), B. poly(APTAC)+SPIONs, C. poly(APTAC)+SPIONs synthesized without using the sonication.

Figure S1 shows iron depth profiles projected onto XY plane for the sonicated scaffolds of poly(APTAC) and poly(APTAC)+SPIONs and moreover poly(APTAC)+SPIONs synthesized without using the sonication. As was shown before iron signal for poly(APTAC) is on the instrumental background level. In poly(APTAC)+SPIONs iron is homogenously distributed in such a projection compared to the sample where SPIONs nanoparticles agglomerates as can be seen in figure S1.C. Therefore it can be concluded that in poly(APTAC)+SPIONs there are no agglomerates of nanoparticles larger than 3 μm (limit comes from lateral resolution of SIMS method in spectrometry mode).

4. Neuroblastoma cells cultured on poly(APTAC)+SPIONs brushes without PLL layer on the top.

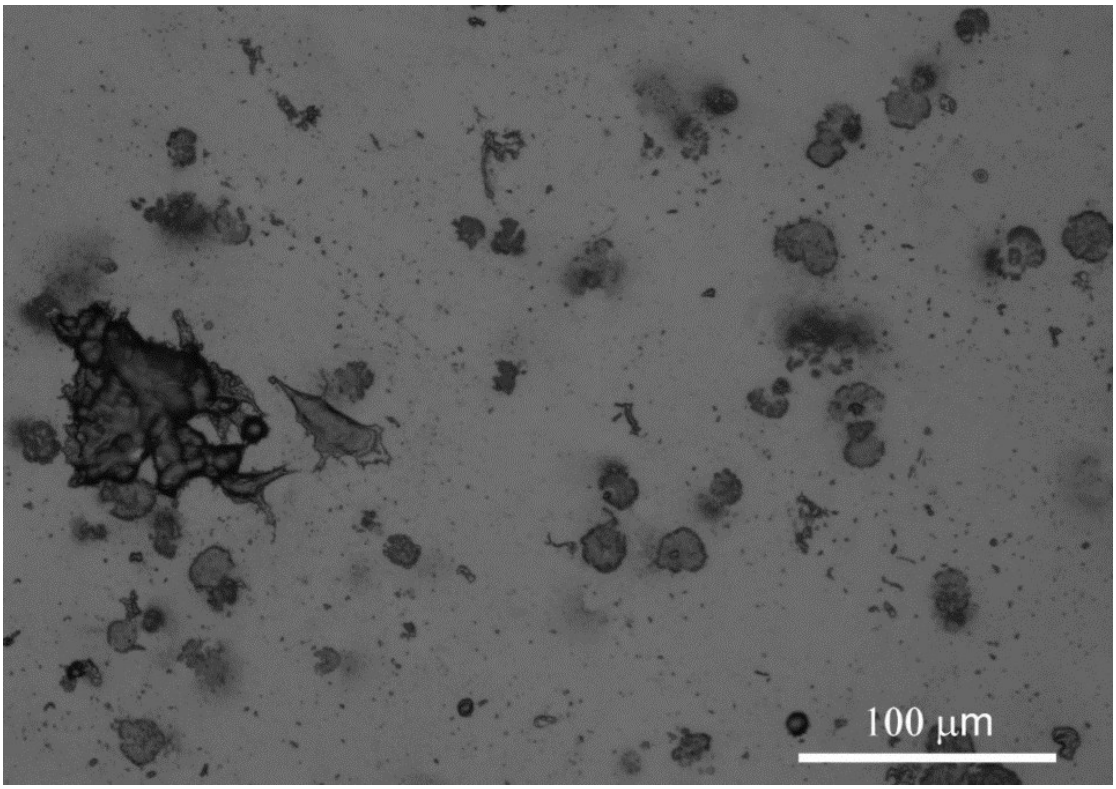

Figure S4. Optical microscopy image of neuroblastoma cells cultured poly(APTAC)+SPIONs brushes without PLL layer on the top.

Neuroblastoma cells were cultured under the same conditions as all used in this work (see. Paragraph 2.5 in the main paper) and seeded on poly(APTAC)+SPIONs brushes without PLL layer in the number of $7.0 \cdot 10^4$ cells/cm^2 and incubated for 24 h.

5. SIMS measurements of poly(APTAC)+SPIONs brushes coated with PLL after applying neodymium magnet and cells detachment.

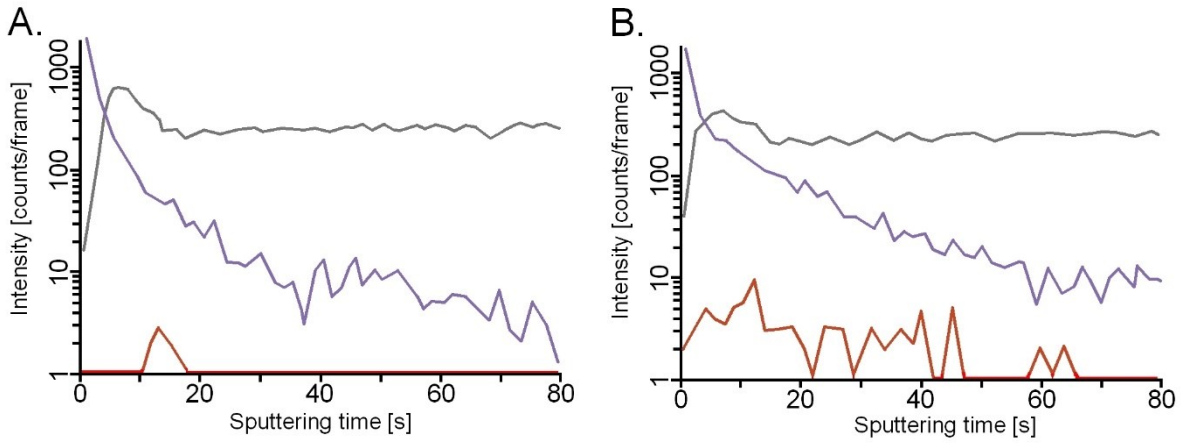

Figure S5. Secondary ion mass spectrometry (SIMS) depth profiles for bare poly(APTAC) (A.) and poly(APTAC)+SPIONs (B.) after cells detachment for 48h in the magnetic field (gray color represent ^{29}Si signal, violet $^{13}CC_2H_{10}N$ and red Fe).