Fig. S1 TEM images (a) and the size distribution curve (b) of the Fe₃O₄ nanoparticles dispersed in ferrofluids.

Fig. S2 Photographs of the ferrofluids (a1, b1), CNC-UF microspheres (a2, b2) and CNC/silica microspheres (a3, b3) dispersed in water: b1, b2, b3 under an external magnetic field.
**Fig. S3** Phase contrast photomicrograph and fluorescent photograph of the FITC-BSA conjugated CNC/silica microspheres with 488 nm excitation.

**Fig. S4** Size distribution of the CNC-UF microspheres in Figure 1.

**Fig. S5** Relationship between the theoretical (without exocytosis) and practical intracellular iron concentration variations as the cell proliferation times.
**Fig. S6** SEM images of CNC-UF/silica microspheres (a) before calcination, (b) after calcination.