

## Supporting Information

### **The role of nanoparticle valency in the nondestructive magnetic-relaxation-mediated detection and magnetic isolation of cells in complex media**

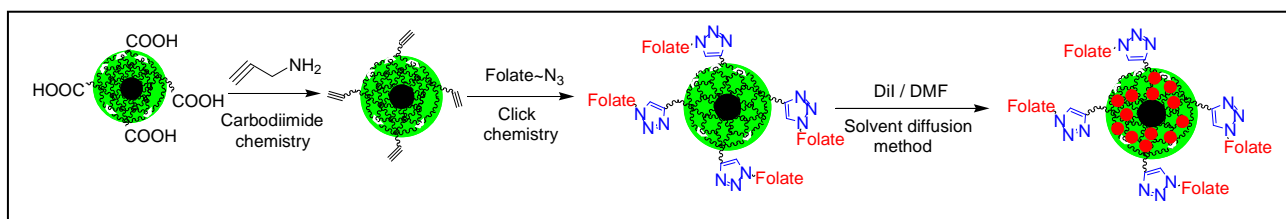
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<sup>‡</sup>Nanoscience Technology Center, <sup>#</sup>Burnett School of Biomedical Sciences – College of Medicine,

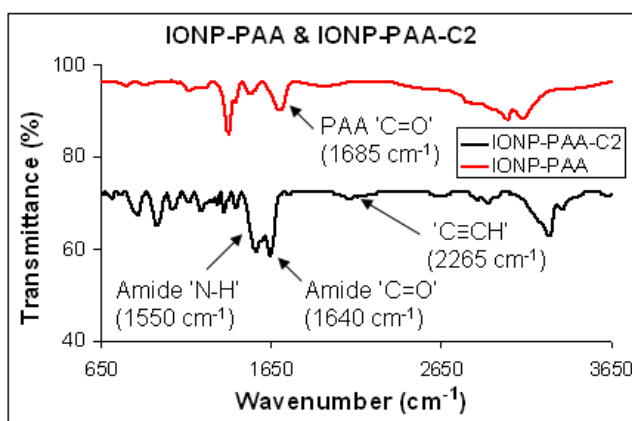
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Orlando, FL 32826

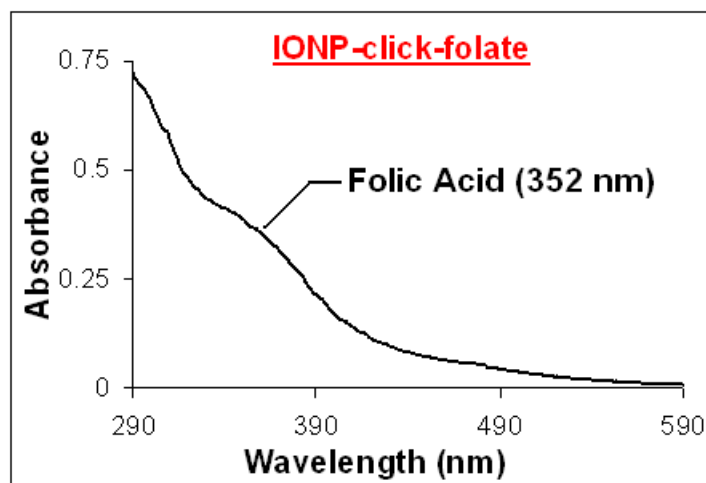
jmperez@mail.ucf.edu



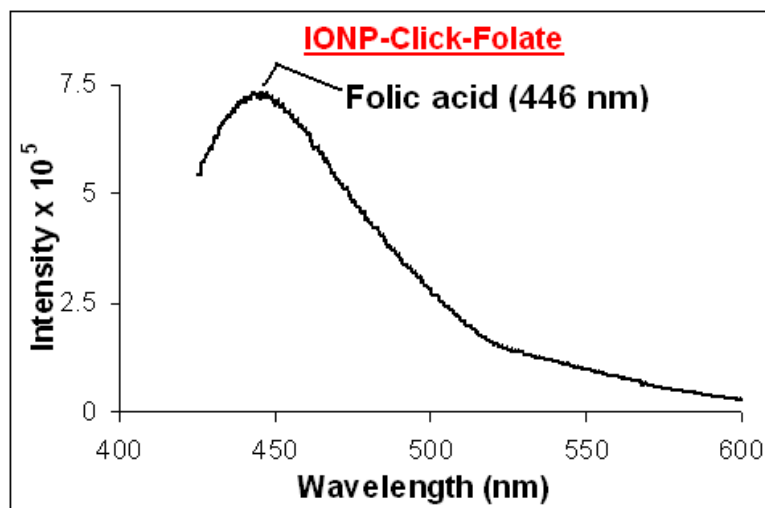
**SI Scheme 1. Schematic representation of the surface modification and folate conjugation to polyacrylic-acid-coated iron oxide nanoparticles.**



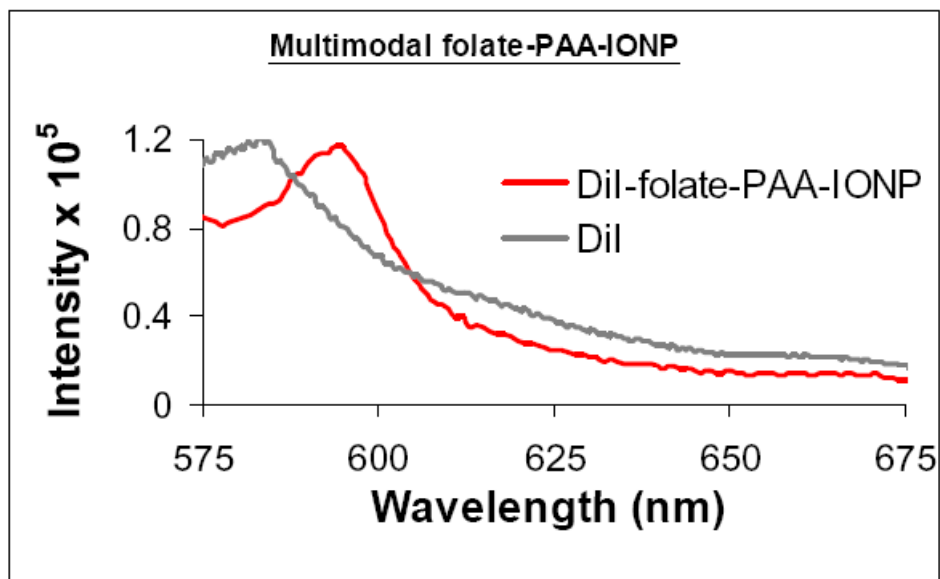
**SI Figure 1. FT-IR spectra of the unmodified and alkyne-modified polyacrylic-acid-coated iron oxide nanoparticles (PAA-IONP).**



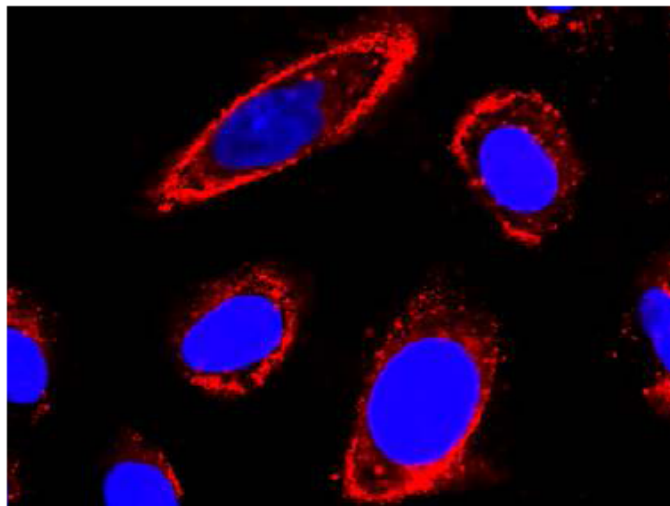
**SI Figure 2. UV/Vis spectrum of the folate-decorated iron oxide nanosensors.**



SI Figure 3. Fluorescence emission spectrum of the folate-conjugated iron oxide nanoparticles.




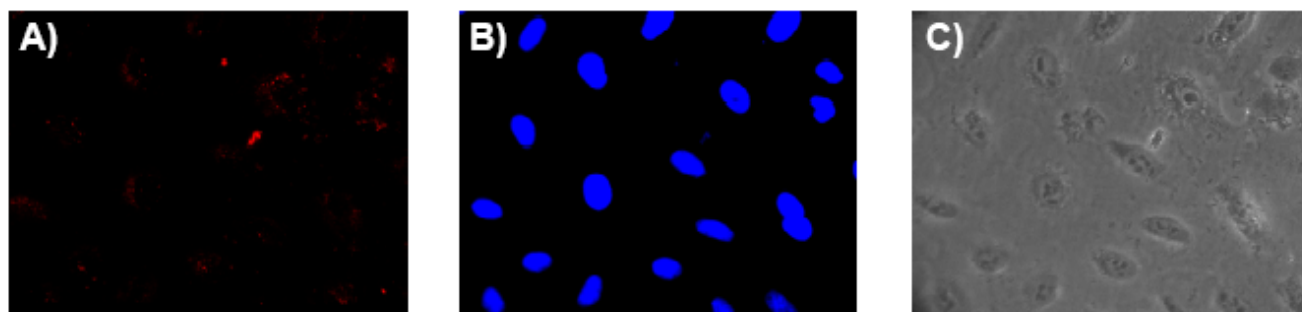
SI Figure 4. Fluorescence emission spectrum of the multimodal DiI-encapsulating folate iron oxide nanoparticles.



**SI Figure 5. Confocal laser-scanning microscopy indicating the association of DiI-encapsulating folate iron oxide nanoparticles with folate-receptor-expressing cells (A549). (Red: DiI, Blue: DAPI)**


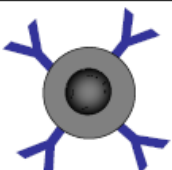
**SI Table 1. Correlation coefficients of quantification curves from time-dependent magnetic relaxation studies.**

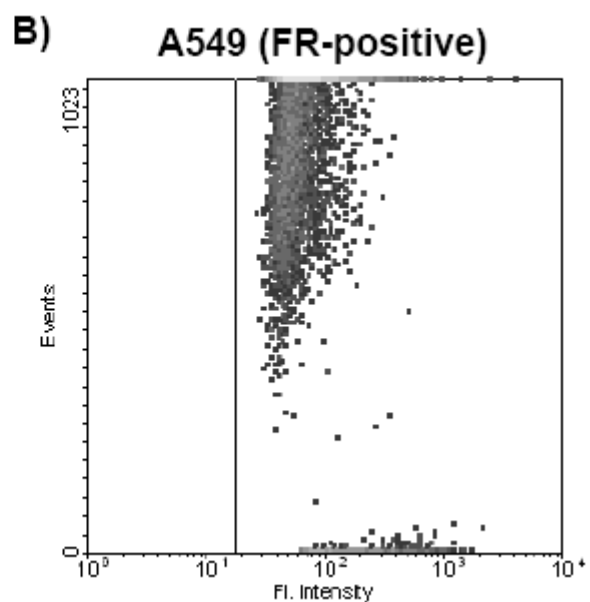
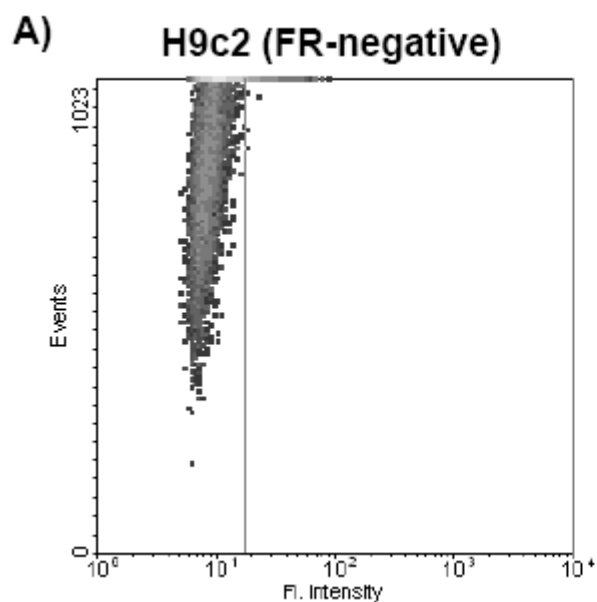
	Time (mins)			
Nanoparticle	15	30	45	60
	0.79	0.84	0.87	0.99
	0.94	0.95	0.96	0.99
	0.76	0.89	0.94	0.99
	0.55	0.86	0.92	0.99



**SI Figure 6. Saturation of the culture media with excess folate prevents the association of the dye-doped folate nanoparticles with A549 cells.** The cells were incubated with the nanosensors for 2 h at 37 °C, 5% CO<sub>2</sub>. (A. Red channel – DiI, B. Blue channel – DAPI, C. Phase contrast).

**SI Table 2. Size distribution of the anti-MAP nanoparticle in the presence of various MAP concentrations.** (Means  $\pm$  SE)

		MAP concentration	
Nanoparticle	Diameter (nm)	Low	High
	> 100	29.9 $\pm$ 0.5%	18.4 $\pm$ 0.7%
	< 100	70.1 $\pm$ 0.4%	81.6 $\pm$ 0.3 %
	>100	17.8 $\pm$ 0.2%	22.7 $\pm$ 0.9%
	< 100	82.2 $\pm$ 0.5 %	77.3 $\pm$ 0.6 %



**SI Figure 7. Determination of the expression of the folate receptor on A) H9c2 and B) A549 cells using flow cytometry.**