

Detection of Lysozyme Using Magnetic Relaxation Switches Based on Aptamer-Functionalized Superparamagnetic Nanoparticles

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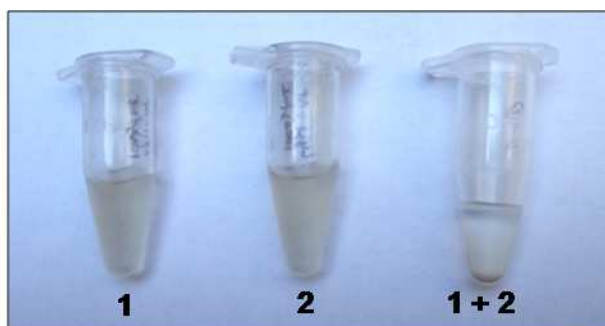
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Supplementary Information

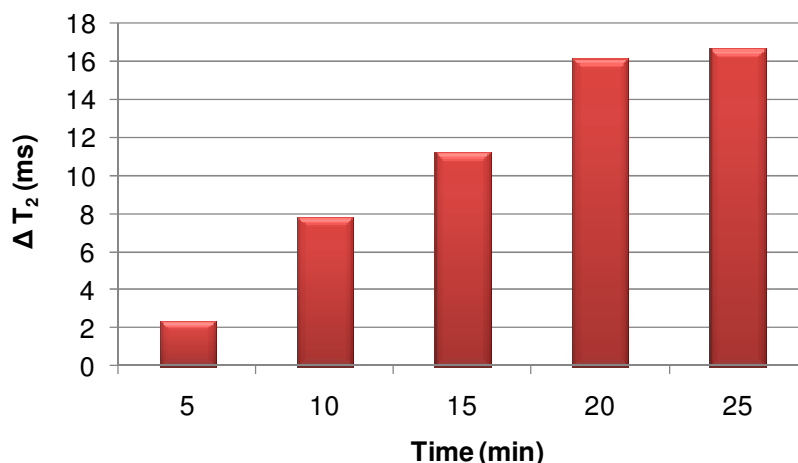
Supplementary Table 1. The formation of magnetic clusters upon hybridization between complementary strands, as detected by changes in T_2 at 5-minute intervals after mixing.

Time (min)	T_2 (ms)		
	MNP-Lys	MNP-Linker	MNP-Lys + MNP-Linker
5	93.7 ± 2.1	97.0 ± 1.7	78.0 ± 2.4
10	93.3 ± 1.9	96.8 ± 3.1	76.6 ± 1.8
20	91.6 ± 2.7	95.8 ± 2.6	76.2 ± 2.2



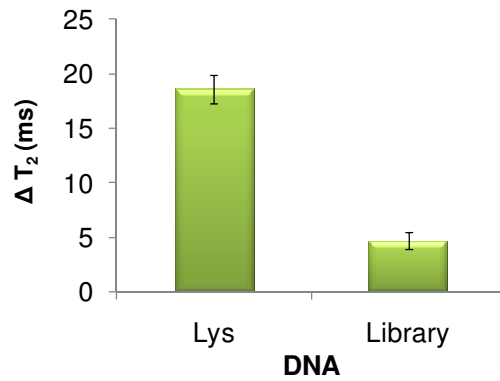
1 :  MNP-Lys aptamer 2 :  MNP-Linker

Supplementary Figure 1. Effect of incubating MNP-Lys aptamer with MNP-Linker at high concentration overnight. The individual conjugates showed good dispersion, corresponding to long T_2 . However, the mixture of MNP-Lys and MNP-Linker showed precipitation at the bottom due to the hybridization between complementary strands, resulting in the formation of large clusters.



$$\Delta T_2 = T_{2\text{sample}} - T_{2\text{blank}}$$

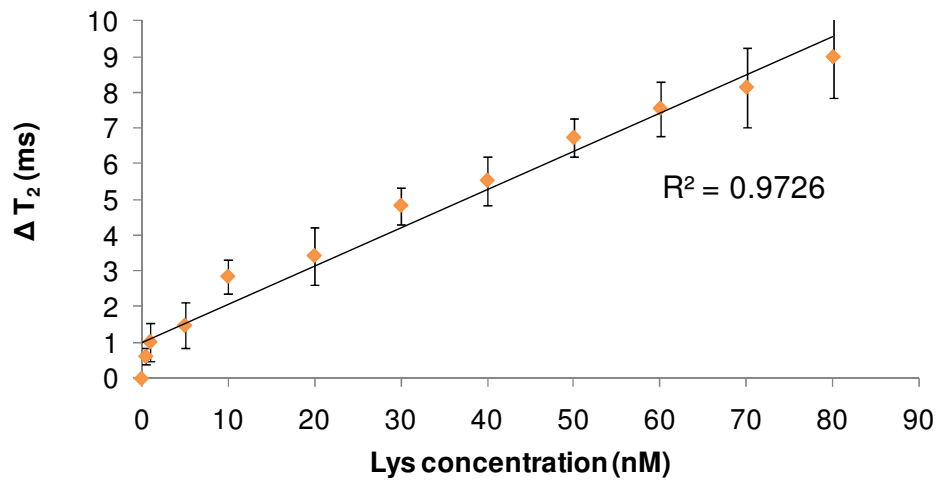
Supplementary Figure 2. A gradual change of ΔT_2 upon the addition of Lys was observed, and the signal reached the maximum within 20 min, indicating the rapid disassembly of magnetic nanosensors.



Aptamer sequences:

Lys Aptamer	5'-Biotin- TTT TTT ATC AGG GCT AAA GAG TGC AGA GTT <u>ACT TAG</u> <u>AGA GA</u> -3'
Library	5'-Biotin- TTT TTT NNN NNN NNN NNN NNN NNN NNN <u>ACT TAG</u> <u>AGA GA</u> -3'

Supplementary Figure 3. Specificity of the magnetic nanosensor. Random sequences were employed to test specificity; results showed no binding to target and only minimal change in T_2 at a Lys concentration of 250 nM.



Supplementary Figure 4. The detection of Lys-spiked human serum using relaxometry measurements.