Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information for "*Immobilization of dengue specific IgM antibodies on magnetite nanoparticles by using facile conjugation strategies*", by G. A. Ortega, J. C. Zuaznabar-Gardona, O. Morales, and E. Reguera

S1: Magnetic characterization of magnetite nanoparticles to be conjugated.

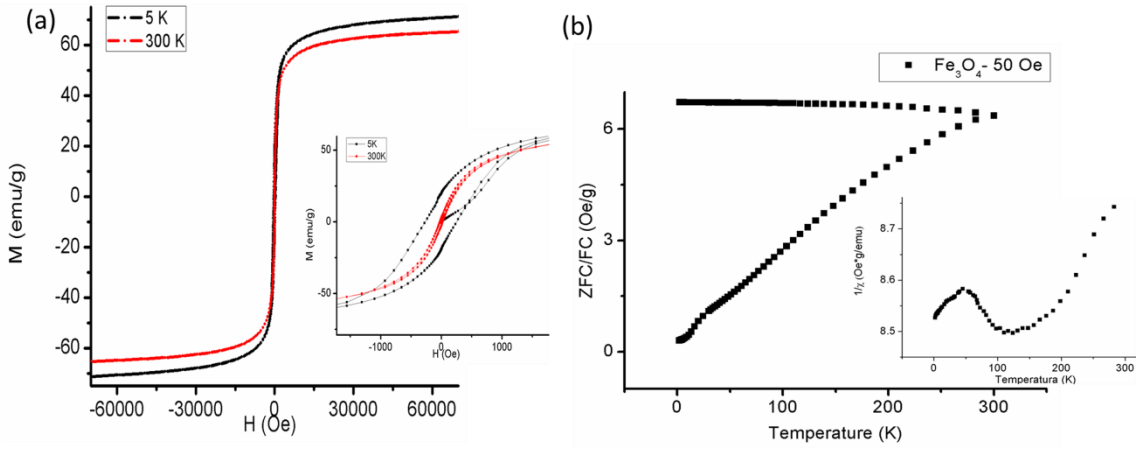


Figure S1: a) Mass magnetization versus applied field for magnetite nanoparticles at 5 K (black line) and 300 K (red line). Insets: amplification of the hysteresis loop. b) ZFC/FC curves of magnetite nanoparticles. Inset: Inverse susceptibility versus temperature curve.

S2: SDS-Page analysis.

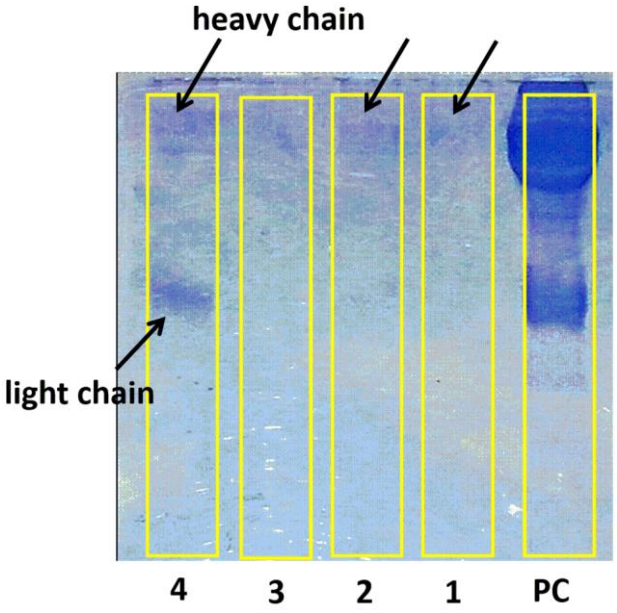


Figure S2: SDS-Page analysis**: (**line PC) 34.21 ug of positive control of IgM-dengue; (line 1) Fe_3O_4-IgM; (line 2) Fe_3O_4@PEG-COOH-IgM; (line 3) Fe_3O_4@PEG-$CONHNH_2$-IgM and (line 4) Fe_3O_4@PDA-IgM.

S3: Measurement of efficacies of the IgM-Fe_3O_4 conjugation strategies.

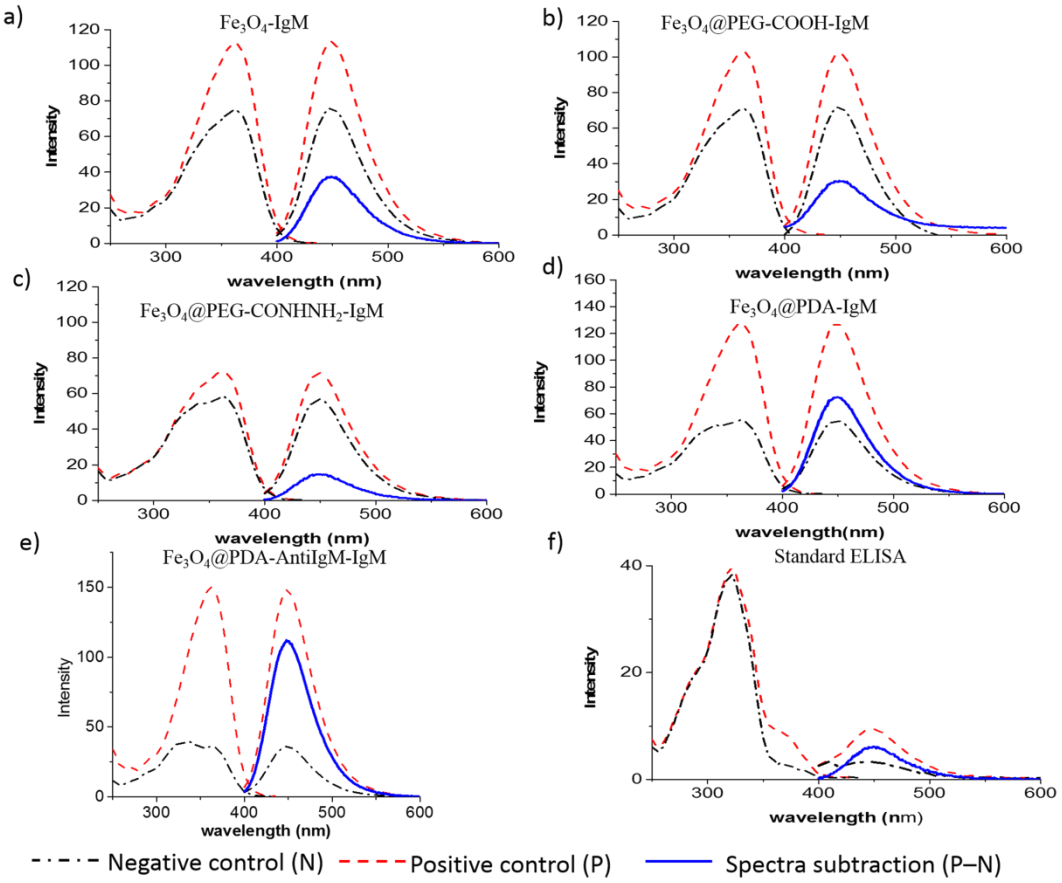
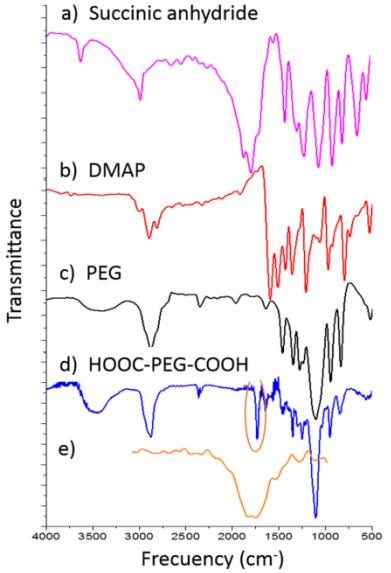


Figure S3: Fluorescence spectra for ELISA assays for IgM-dengue (negative and positive controls) coupled on magnetite nanoparticles by the different strategies.

S4. Synthesis of Polyethyleneglycol dicarboxilic acid (HOOC-PEG-COOH)

1 g of poly(ethylene glycol) (average molecular weight 1500 Da), 5 eq of succinic anhidride (0.325 g) and 0.1 eq of 4-(N,N-dimethylamino)pyridine (DMAP) (0.04 g) were dissolved in 15 mL of dichloromethane. The mixture was stirred for 72 hours at room temperature. The white solid precipitated was filtered over a plug of celite and the solvent was evaporated by using a rotary evaporator till get a transparent oil. The raw product was purified multiple times (approximately 3–5) by adding 5 mL of cool ether to precipitate byproducts. Figure 1S shows FTIR spectra of used reagents and the product.



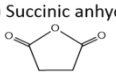
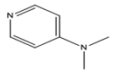
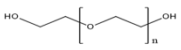
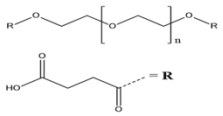
	Value (cm^{-1})	Assignment
a) Succinic anhydride 	2960	$\nu_{CH_2}^{as}$
	1873-1778	$\nu_{C=O}^{as}$- $\nu_{C=O}^{s}$
b) DMAP 	3034-3000	$\nu_{C_{SP_2}-H}$
	2895-2800	$\nu_{C_{SP_3}-H}$
	1602, 1536, 1516, 1440	$\nu_{C=C}$ (aromatic pattern)
	1230	ν_{C-N}
c) PEG 	3443	ν_{OH}
	2945-2881	$\nu_{CH_2}^{as}$- $\nu_{CH_2}^{s}$
	1463	$\delta_{CH_2}^{s}$
	1100-1057	ν_{C-O}
d) HOOC-PEG-COOH 	3464	ν_{OH}
	2900-2874	$\nu_{CH_2}^{as}$- $\nu_{CH_2}^{s}$
	1735	$\nu_{C=O}$ (aliphatic ester)
	1728	$\nu_{C=O}$ (asociated acid)
	1106	ν_{C-O}

Figure S4: FTIR spectra and assignation of the bands of used reagents and the product (HOOC-PEG-COOH).