Supplementary Information

Simultaneous inhibition of EGFR and MET receptors with phytochemical conjugated magnetic nanocarriers: *in silico* and *in vitro* study

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Experimental Details

Characterization of PEP-SPIONs

SPIONs and PEP-SPIONs were characterized by various analytical techniques to determine their morphological characteristics. The average hydrodynamic size and zeta potential of the synthesized nanoparticles were studied using Nanopartica SZ-100 (Horiba Ltd., Kyoto, Japan). The magnetic behavior of the nanoparticles was analyzed using VSM (Lake Shore: 7404). FTIR absorption (Shimadzu, Japan) spectra was recorded between 4000 and 400 cm^{-1} to elucidate functional groups in SPION and PEP-SPIONs. Encapsulation of nanoparticles with the extracts were confirmed with DSC (TA instruments, Q20). The size of the nanoparticles and surface elemental composition were respectively assessed TEM (Jeol, JEM 2100) images and the was Energy-dispersive X-ray (EDX) spectrum.

Results
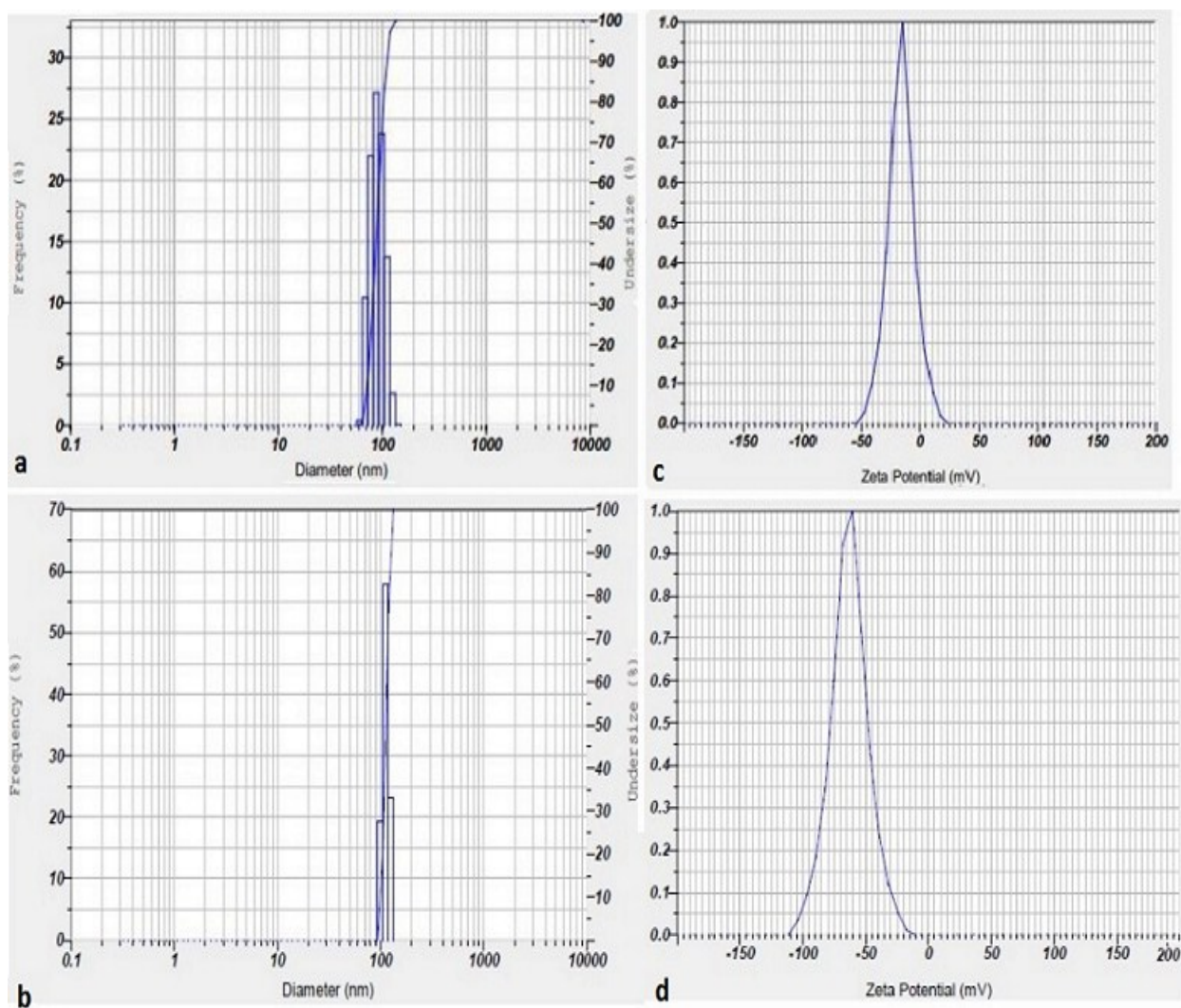
Fig. S1 Hydrodynamic size of (a) SPIONs and (b) PEP-SPIONs as measured by DLS technique. SPION has a wider distribution of nanoparticles with mean diameter of 90.3 nm, whereas PEP-SPION has narrow distribution with 112.6 nm respectively. Zeta potential of (c) SPIONs and (d) were estimated to be -15.8 mV and -62.9 mV, respectively.
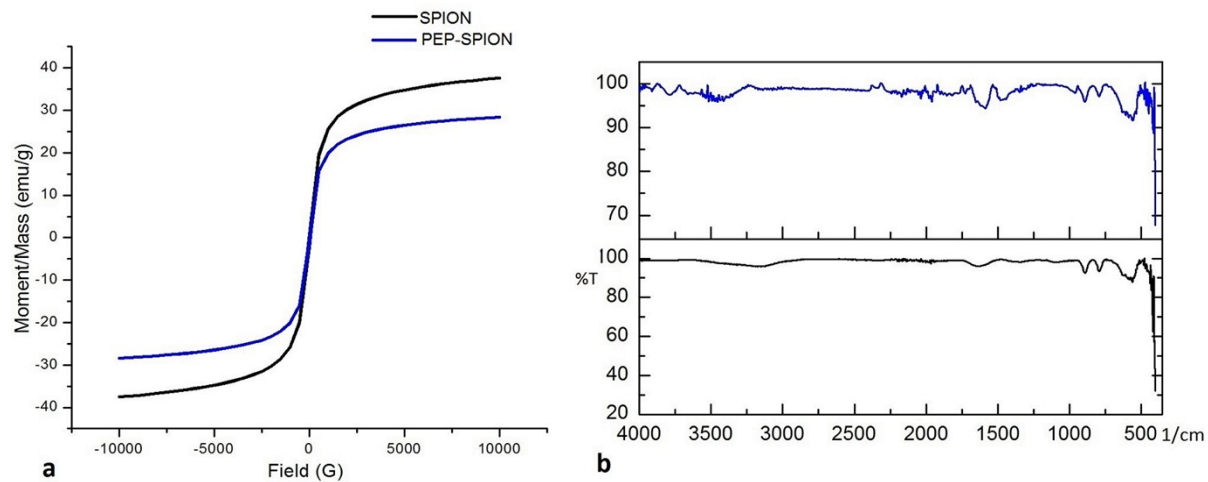
Fig. S2 Characterization of SPIONs with (a) VSM for superparamagnetic properties and (b) FTIR for identification of various functional groups.
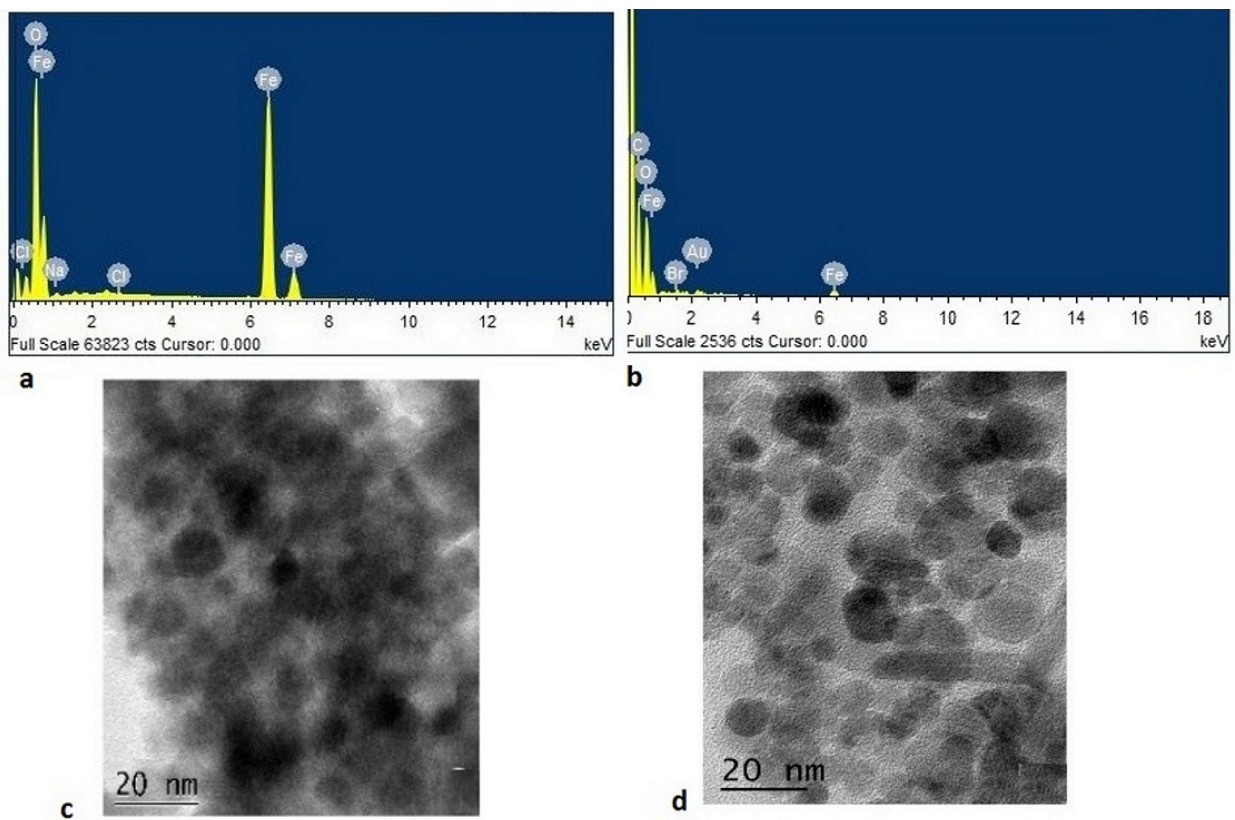
Fig. S3 EDAX analysis of (a) SPIONs showing existence of Fe, O and (b) *Mentha piperita* extract coated SPIONs showing the presence of organic, in-organic elements. TEM images of the (c) SPIONs (d) coated SPIONs reveals their morphology (i.e. size and shape).
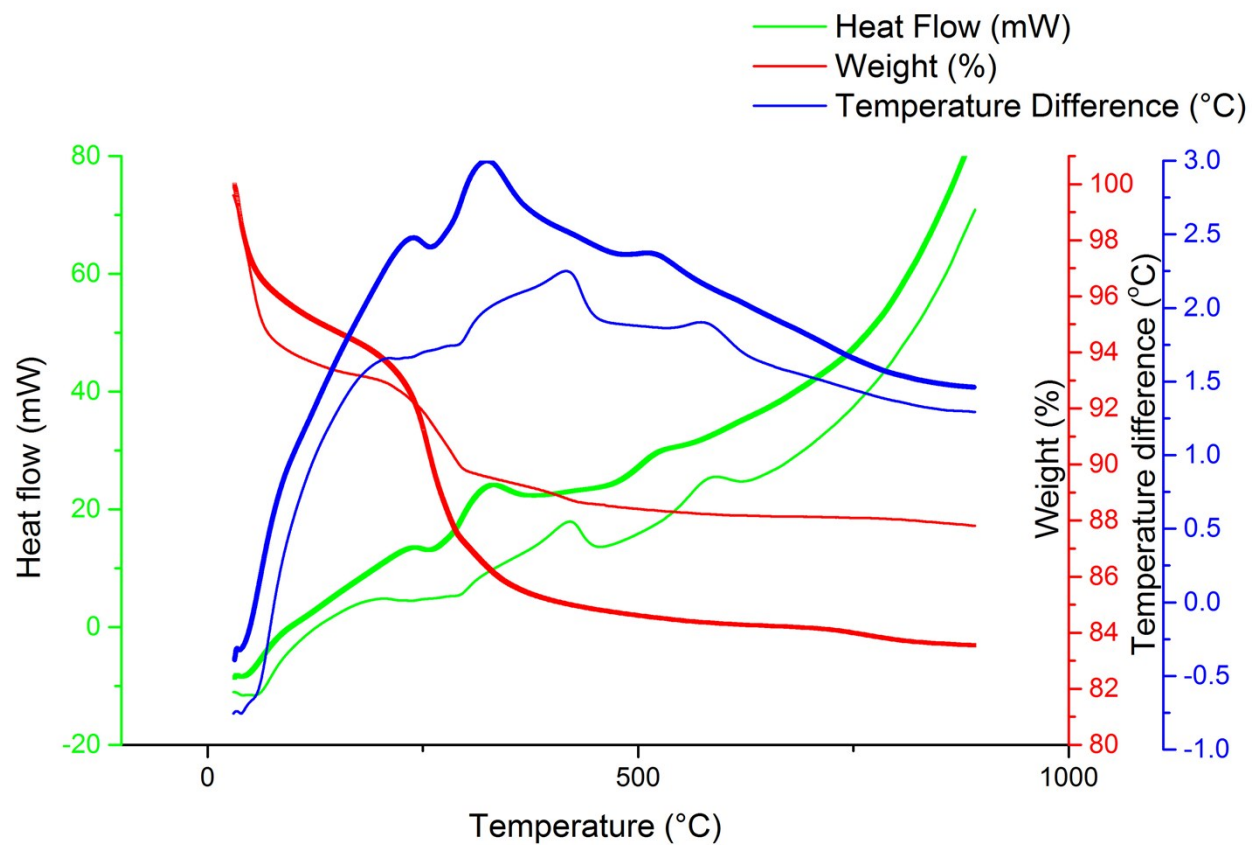
Fig. S4 Thermogravimetric behavior of SPIONs (thin lines) and PEP-SPIONs (thick lines) as analyzed by DSC.

Table S1 Characterization of SPIONs by DLS and VSM analysis

Nanoparticle	DLS Size (nm)	PI	Zeta (mV)	Coercivity (Hci) G	Magnetization (Ms) emu/g	Retentivity (Mr) emu/g
SPION	90.3	0.3	-15.8	34.950	37.587	1.4983
PEP-SPION	112.6	0	-62.9	13.167	28.411	0.45420