

## Electronic Supporting Information

### Cobalt Ferrite Nanowhiskers as T<sub>2</sub> MRI Contrast agent

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#### 1.0 Materials

The chemical reagents used in the work were ferric chloride (FeCl<sub>3</sub>•6H<sub>2</sub>O), Cobalt (II) nitrate hexahydrate (CoN<sub>2</sub>O<sub>6</sub>• 6H<sub>2</sub>O), sodium hydroxide (NaOH) and Hydrochloric acid (HCl). All the chemicals were of analytical grade purchased from sigma Aldrich and were directly used without any further purification.

#### 2.0 Characterization

The products were characterized and the structure of the nanowhiskers were determined from High resolution transmission electron microscope (HRTEM) (JEOL, JEM-ARM200F) and X-ray diffractometer (XRD) (PAN analytical, X'Pert Powder) using a Cu K $\alpha$  radiation ( $\lambda=1.5406$  Å). The magnetic studies were conducted on a superconducting quantum interference device (SQUID), (Quantum Design, MPMS SQUID-VSM). The zeta potential ( $\zeta$ ) of CfW in water, PBS and DMEM-FBS medium were measured with Zetasizer Nano ZS90 (Malvern instruments) at a wavelength of 633 nm with a 4.0 mW, solid-state He-Ne laser at a scattering angle of 90° at 25°C. Zeiss LSM 700 confocal microscope equipped with a 63X (N.A. 1.2) oil-immersion lens was used for collecting confocal z-series images. Images were processed with Zen 2012 Software.

#### 3.0 Zeta potential measurements

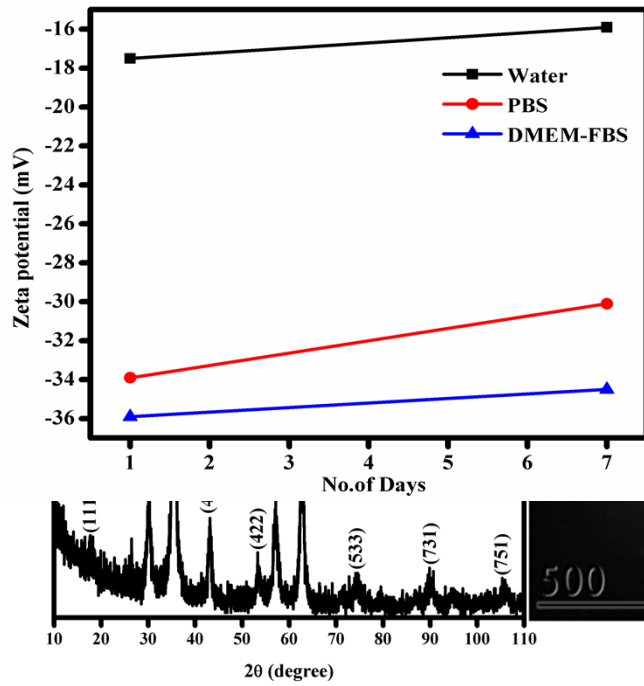
To carry out zeta potential measurements, 700 $\mu$ l of solution was placed in a quartz cuvette for analysis. The sample was analysed continuously for 7 days to measure the zeta potential and hydrodynamic diameter in various mediums and also the stability of CfW in all 3 mediums by varying different pH 1-12 was determined as a function of the equilibrium pH using a universal zeta dip cell. The pH of these solutions was adjusted before the analysis process between 1 and 12 using pH meter.

#### 4.0 MRI parameters

MRI experiments were performed with a 7T clinical Signa HDxt scanner (Varian). T<sub>2</sub>-weighted images were acquired using the following parameters: 7 T, Repetition time TR = 2000 ms, Echo time TE = 15-250ms, FOV = 3\*3cm, resolution 256  $\times$  256 points and slice thickness = 4mm. And for T<sub>1</sub> measurements coronal spin-echo sequences with fixed echo time (TE) = 24 ms and varying repetition time (TR) (25 ms to 4 s) were used.

#### 5.0 Phantom preparation

A pellet containing CfW labelled cells was mixed with 1.5ml of 0.5% agarose gel heated at 40°C. Then the CfW labeled cells are mixed with agar phantom and cooled at 4°C.

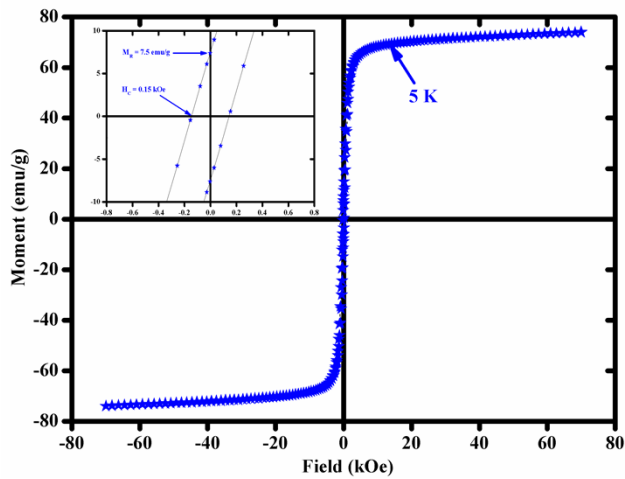


### 6.0 Cell culturing techniques

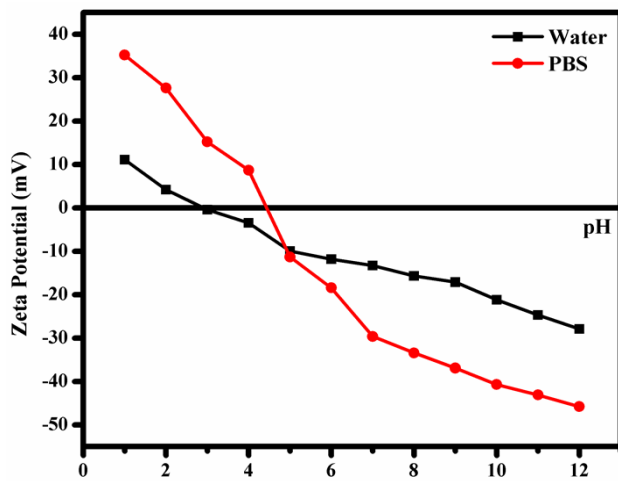
For MTT assay, L6 cells were grown in 35mm sterile cell culture petri dishes to approximately 70% confluency in CO<sub>2</sub> incubator.

### 7.0 Results

**Fig.S1a)** XRD pattern & b) SAED pattern of CfW



**Fig.S2** Variation of magnetization with applied magnetic field for the CfW at temperature 5K



**Fig.S3** Stability of CfW in Water and PBS at various pH 1-12

**Fig.S4** Zeta potential of CfW in various mediums

**Table 1** Value of Zeta potential ( $\zeta$ ) and IEP of CfW dispersed in distilled H<sub>2</sub>O, PBS and DMEM-2%FBS

<b>Samples</b>	<b>Zeta potential pH=7.4 (mV)</b>	<b>IEP</b>
Distilled H <sub>2</sub> O	-11.8	2.8
PBS	-29.6	4.4
DMEM-2%FBS	-35.9	-