Supporting Information:

Langevin fit:

To calculate the value of magnetic particle concentration in ferrofibers M-H curves (Figure 3(b)) were fitted using Langevin function:

$$M = \int_{0}^{-\infty} L(\alpha) f(D) dD - \chi_i H \quad \text{(i)}$$

where L(α): Langevin function

$$L(\alpha) = M_s^f(\coth(\alpha) - \frac{1}{\alpha}) \quad \text{(ii)} \quad \text{with} \quad \alpha = \frac{M_d H((\frac{1}{6})\pi D^3}{kT} \;;$$

and $M_S^f = \emptyset M_d$ (iii)

and f(D): log – normal size distribution of magnetic nanoparticles.

$$f(D) = \frac{1}{\sqrt{2\pi}\sigma_D D} e^{\{-\frac{\ln\left(\frac{D}{D_o}\right)^2}{2\sigma_D^2}\}} \quad \text{(iv)}$$

where σ_D: standard deviation; H: applied field; k: Boltzmann constant; T: temperature; M_S^f: fluid magnetisation; $\emptyset$: solid volume fraction of magnetic nanoparticles in ferrofibers; M_d: domain magnetisation; D: particle diameter; D_o : median diameter and $\chi_i H$: diamagnetic contribution from surfactant and PVA .

Now particle concentration is given as:

$$\emptyset = n'(\frac{1}{6}\pi D^3) \quad \text{(v)}$$

Further, inter-particle distance can be calculated using $(1/n')^{1/3}$ assuming uniform form particle distribution. The best fit of eq. (i) is obtained using parameters given in table 1S with respective particle concentration and volume fraction for each sample.

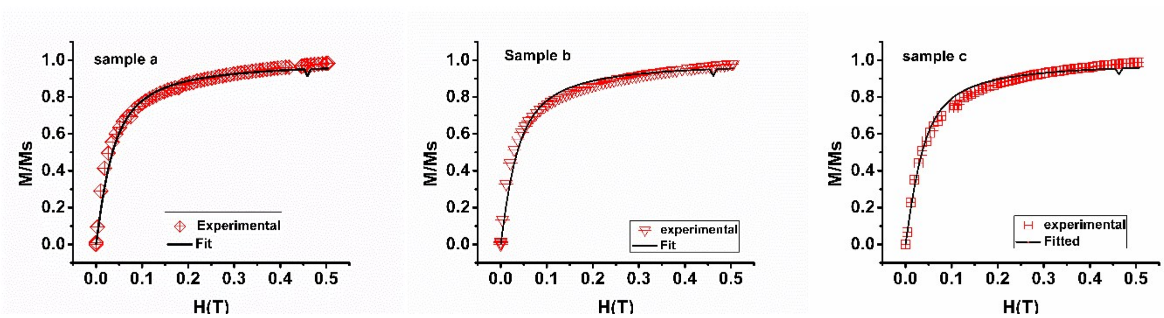

Figure 1S: Langevin fit of ferrofibers show superparamagnetic behaviour and magnetic diameter is in agreement with crystallite size calculated from XRD data.

ddTable 1S: Langevin fitting parameters

Parameter / Sample	M_S^f (emu/g)	M_d (G)	D (nm)	σ_D	$\emptyset$	n'	r (nm)

a	1.21	384	10.9	0.32	0.018	2.59×10^{22}	33.8
b	2.72	384	10.9	0.32	0.042	6.04×10^{22}	25.5
c	3.72	384	10.9	0.32	0.058	8.35×10^{22}	22.8