

## Supporting information

### **Superparamagnetic Fe/Au nanoparticles and their feasibility for magnetic hyperthermia**

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**Table S1:** Comparison of coercivity and saturation magnetization

Materials	Temperature (K)	Coercivity (mT)	Saturation magnetization (emu/g)	Reference
$\text{Fe}_3\text{O}_4$	100	16.08	55.74	[1]
	300	1.68	51.68	[2]
	10	34.9	57.1	[3]
HA-Ferrite Composite	300	12.0	0.83	[4]
Magnetic-HAP composite	300	7.9	7.40	[5]
Fe/Au Core shell	-	-	165	Present

[1] M.H. Fathi, E.M. Zahraei, Fabrication and characterization of fluoridated hydroxyapatite nanopowders via mechanical alloying, *J. Alloys Compd.* 475 (2009) 408e414.

[2] N. Johari, M.H. Fathi, M.A. Golozar, The effect of fluorine content on the mechanical properties of poly (-caprolactone)/nano-fluoridated hydroxyapatite scaffold for bone-tissue engineering, *Ceram. Int.* 37 (2011) 3247e3251.

[3] C. Zhang, S. Huang, D. Yang, X. Kang, M. Shang, C. Peng, J. Lin, Tunable luminescence in  $\text{Ce}^{3+}$ ,  $\text{Mn}^{2+}$ -codoped calcium fluorapatite through combining emissions and modulation of excitation: a novel strategy to white light emission, *J. Mater. Chem.* 20 (2010) 6674e6680.

[4] T. Iwasaki, R. Nakatsuka, K. Murase, H. Takata, H. Nakamura, S. Watano, Simple and rapid synthesis of magnetite/hydroxyapatite composites for hyperthermia treatments via a mechanochemical route, *Int. J. Mol. Sci.* 14 (2013) 9365e9378.

[5] P.B. Shete, R.M. Patil, N.D. Thorat, A. Prasad, R.S. Ningthoujam, S.J. Ghosh, S.H. Pawar, Magnetic chitosan nanocomposite for hyperthermia therapy application: preparation, characterization and in vitro experiments, *Appl. Surf. Sci.* 288 (2014) 149e157.