

Understanding the effects of silica nanoparticles in cancer cells through characterization

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Table S1. Particle size determined by DLS (Dh hydrodynamic diameter and PDI), DCS and surface charge by Z potential of SiNPs in water.

sample	DLS		Z pot (mV)	DCS
	D _h (nm)	PDI		d(nm)
St186	229	0.086	-49	194
St108	136	0.018	-47	126
St65	85	0.105	-44	69
St21	43	0.253	-24	24

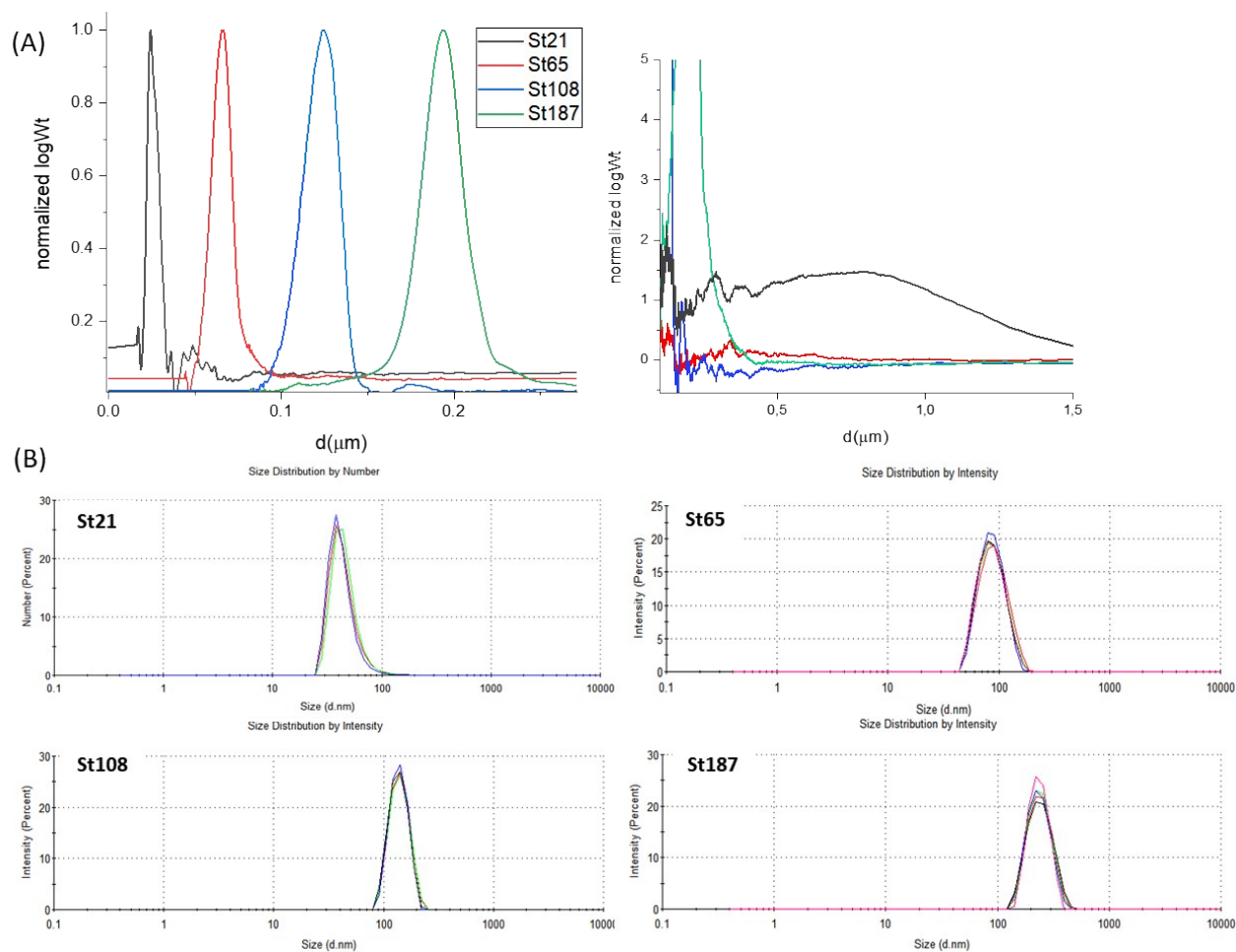


Figure S1. Analysis of stability of SiNPs water dispersions. (A) DCS analysis, on the right magnification showing aggregation of sample St21; (B) DLS intensity plots of St65, St108 and St187, while in the case of St21 the plot corresponds to the intensity by number.

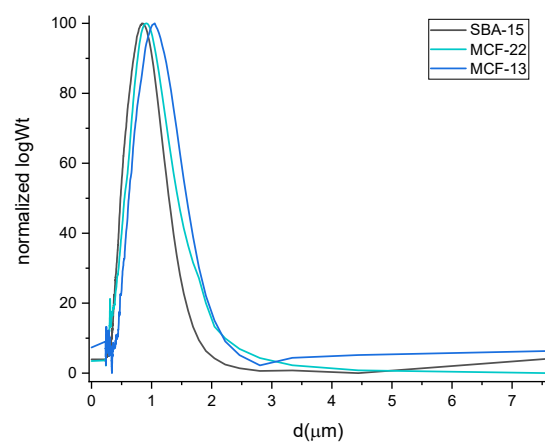


Figure S2. DCS analysis of MSNs in water.

Table S2. DLS analysis of SiNPs in CCM with and without FBS, PBS and SC.

sample	FBS-RPMI		SF-RPMI		SC			PBS		
	D _h (nm)	PDI	D _h (nm)	PDI	D _h (nm)	PDI	ZP mV	D _h (nm)	PDI	ZP mV
St65	308	0.09	772	0.63	278	0.18	-7	404	0.3	-19
St108	202	0.11	160	0.21	192	0.13	-4	139	0.14	-17
St187	170	0.15	100	0.17	161	0.17	-5	114	0.17	-17

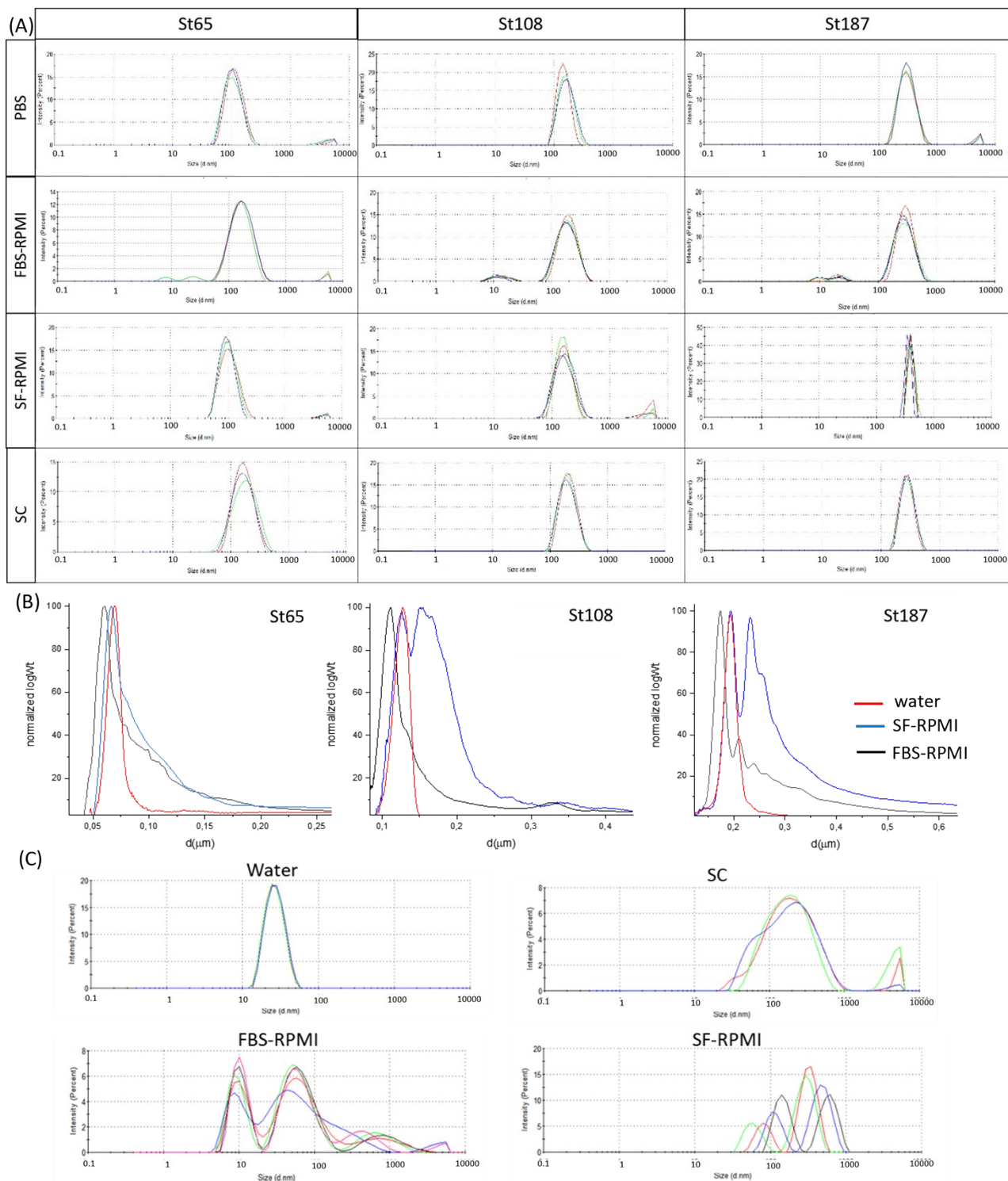


Figure S3. Analysis of stability of SiNPs dispersions in complex media. (A) DLS analysis of SiNPs in FBS-RPMI 1640 and SF-RPMI 1640, PBS and SC. All the reported plots refer to intensity distributions. (B) DCS plot of SiNPs in RPMI 1640 with and without FBS. (C) DLS of St20Com standard particles in FBS-RPMI 1640 and SF-RPMI 1640, PBS and SC.

Table S3. DCS and DLS analysis of St108 dispersed in different CCM with FBS and as serum free (SF). Peaks positions of DCS are reported along with Dh and PDI obtained from DLS.

CCM	FBS			SF		
	Dh(nm)	PDI	DCS peak (nm)	Dh(nm)	PDI	DCS peak (nm)
MEM	199	0.17	104	259	0.83	129
HAM	209	0.12	110	163	0.11	129
Mc Coy's 5A	219	0.17	105	216	0.18	129
RPMI	202	0.11	111	169	0.14	124

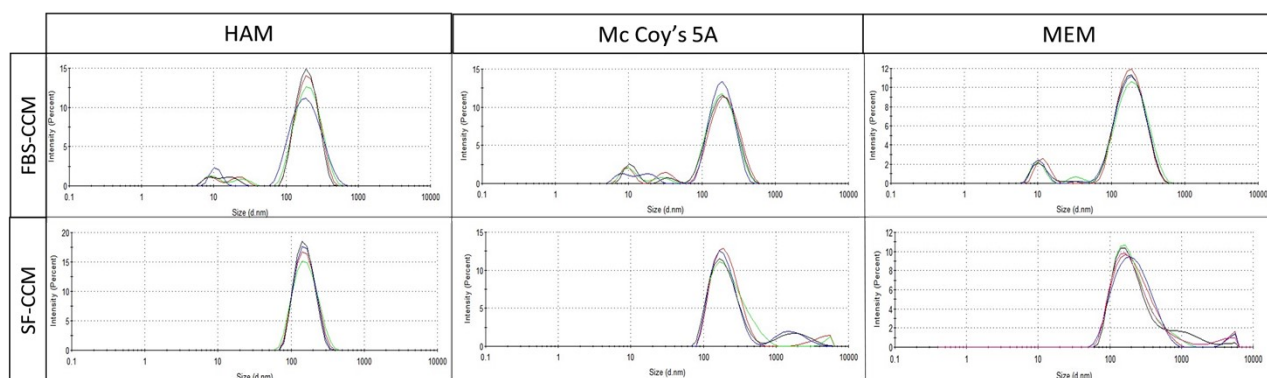


Figure S4. DLS analysis of St108 samples dispersed in different CCM expressed as intensity plots.

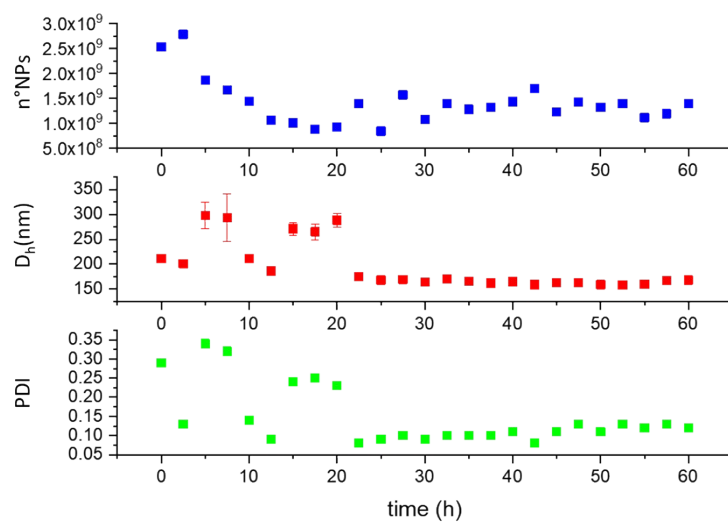


Figure S5. DLS analysis during time of St108 in Mc Coy's 5A. Particle counting (n° NPs), D_h and PDI are reported as a function of time.

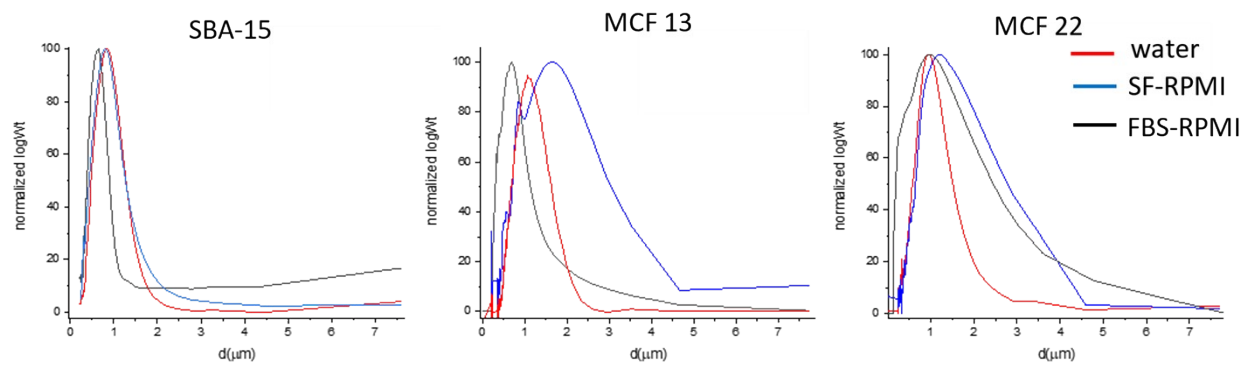


Figure S6. DCS analysis of MSNs in water, FBS- RPMI and SF-RPMI.

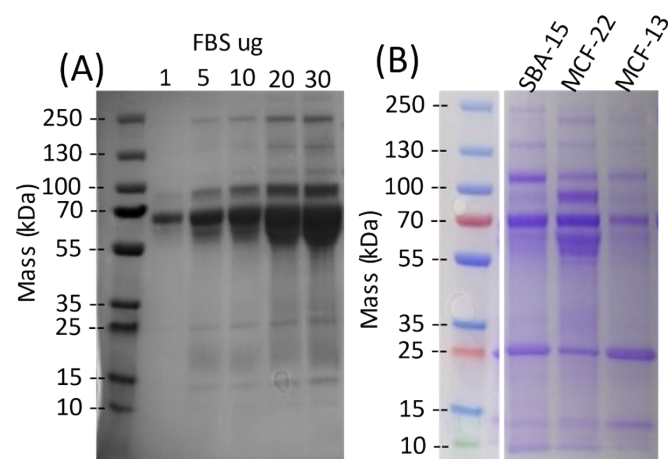


Figure S7. SDS-PAGE analysis. (A) FBS (from 1 to 30 ug) (B) MSN incubated with McCoy's5A with 10%FBS.

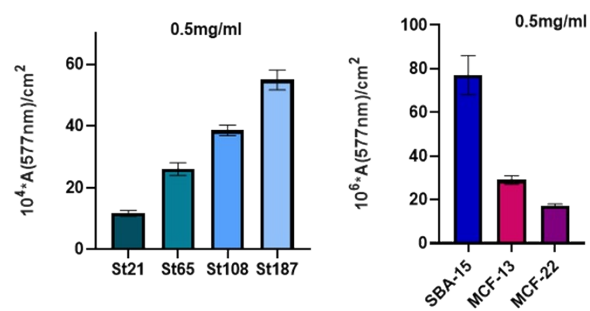


Figure S8. Hemolysis expressed as absorbance value normalized on NPs' surface area obtained at 0.5mg/ml of SiNPs on the left and MSN on the right. Errors correspond to \pm SD.

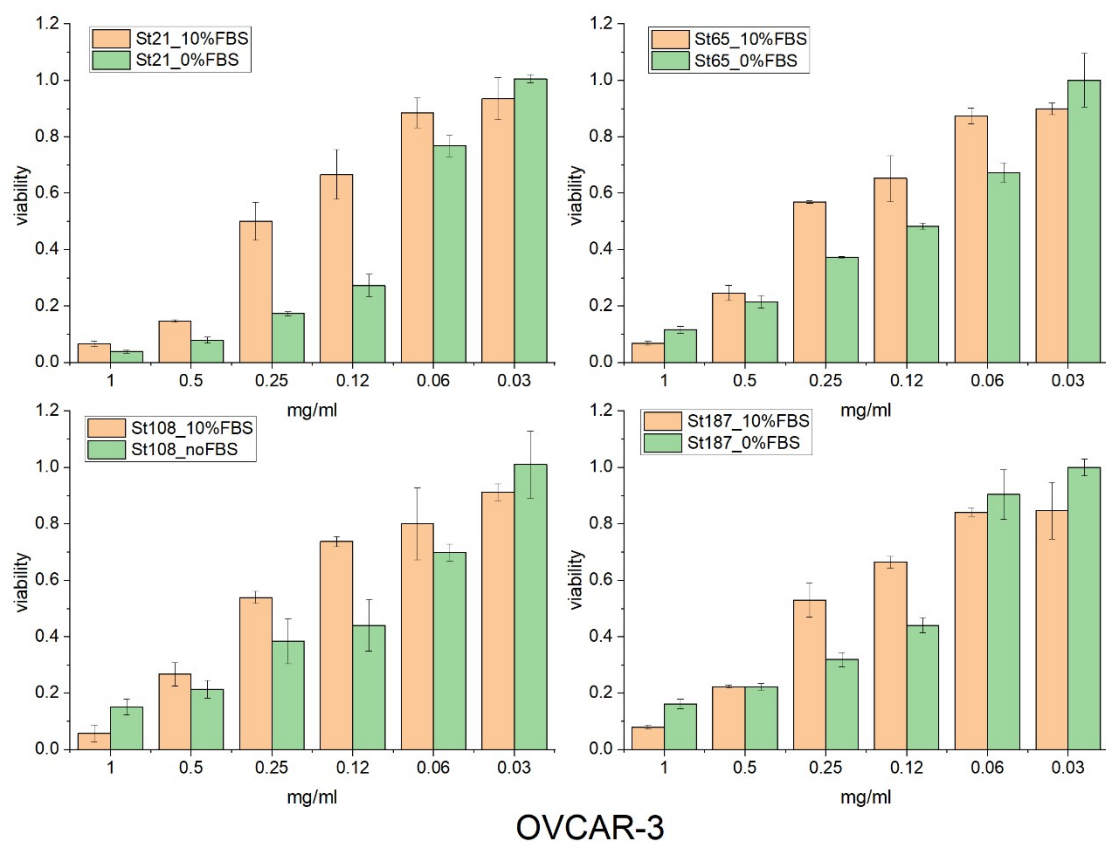
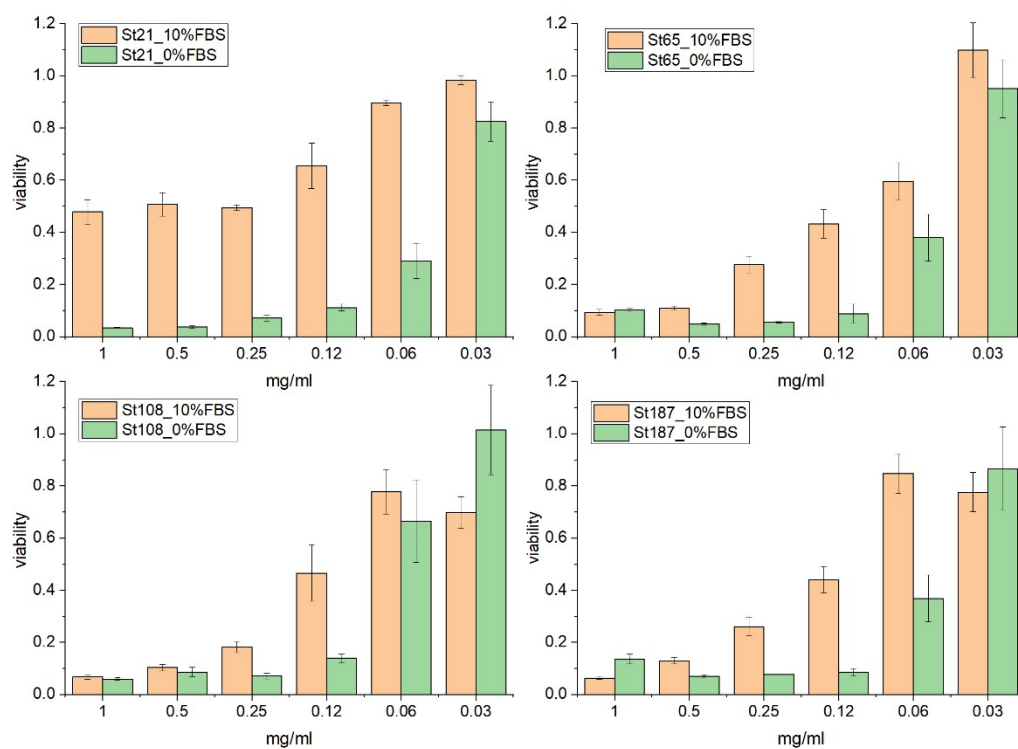


Figure S9. Bar plots of normalized viability values of OVCAR-3 exposed for 96 hours to SiNPs at different concentrations, both in presence and absence of FBS. Errors correspond to \pm SD.



A549

Figure S10. Bar plots of normalized viability values of A549 exposed for 96 hours to SiNPs at different concentrations, both in presence and absence of FBS. Errors correspond to \pm SD.

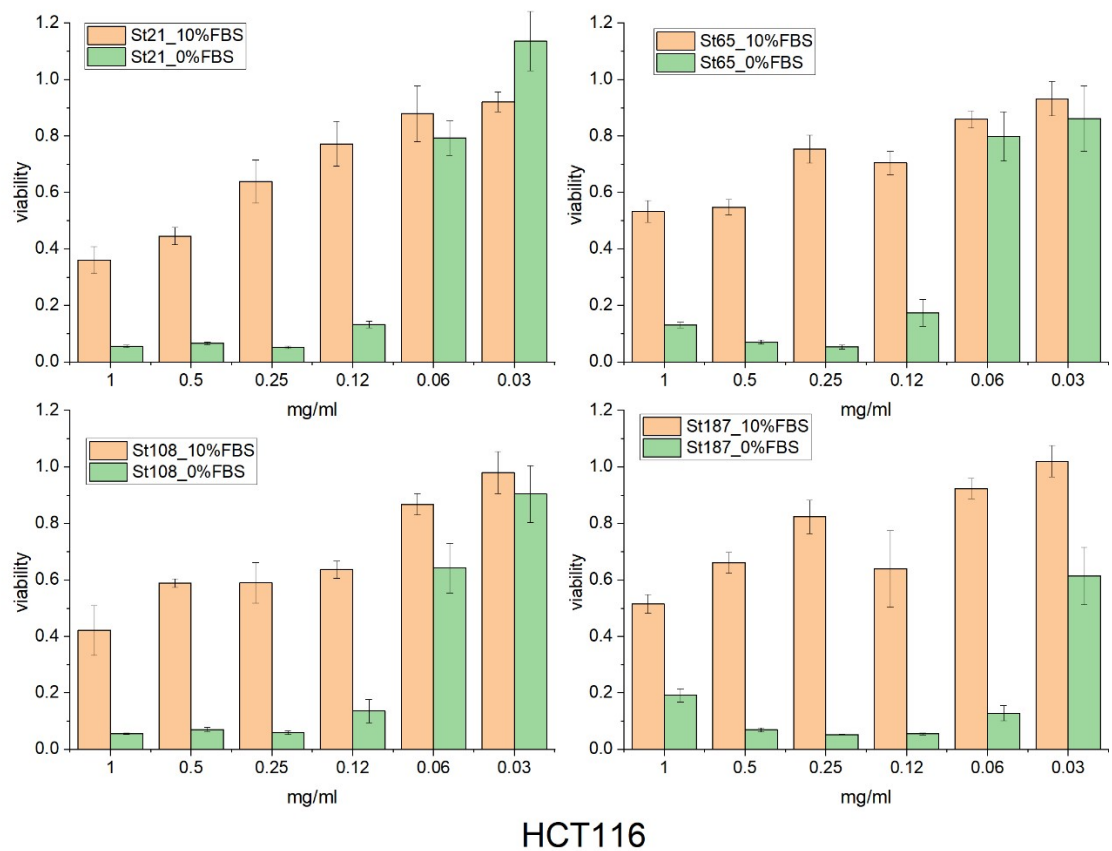


Figure S11. Bar plots of normalized viability values of HCT116 exposed for 96 hours to SiNPs at different concentration both in the presence and absence of FBS. Errors correspond to \pm SD.

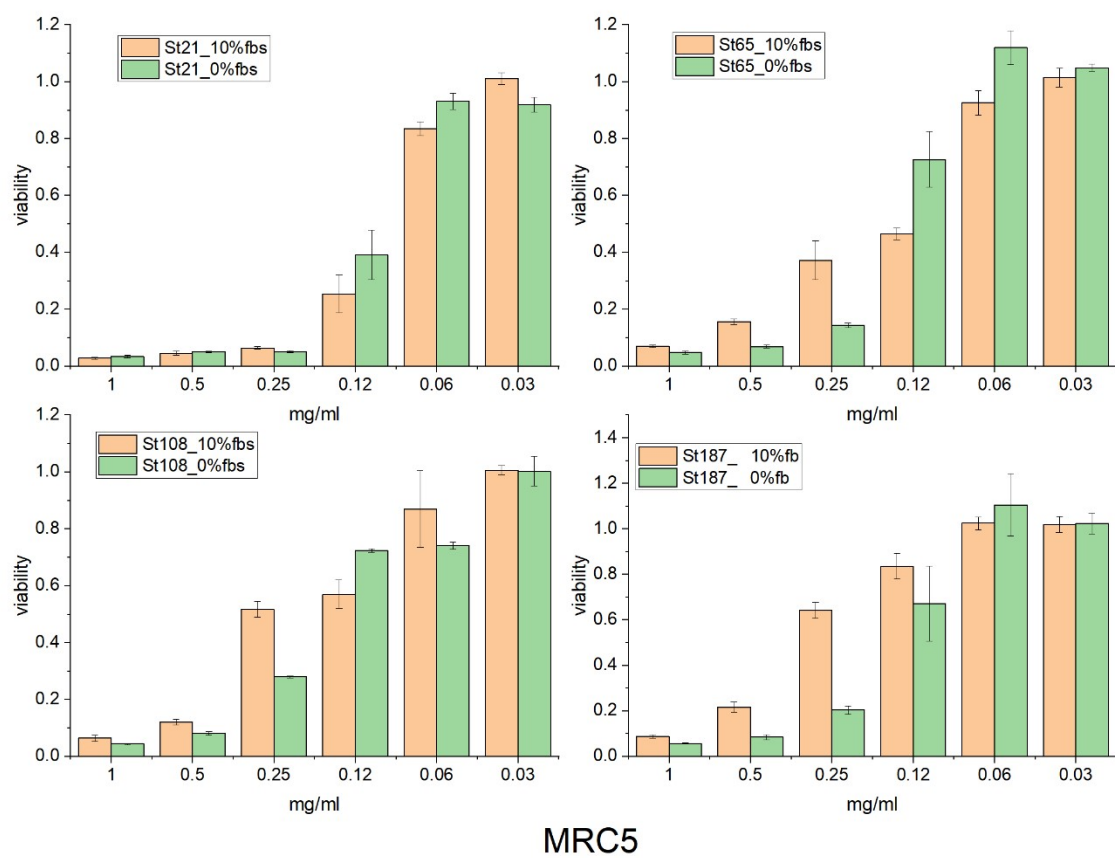


Figure S12. Bar plots of normalized viability values of MRC-5 exposed for 96 hours to SiNPs at different concentrations, both in presence and absence of FBS. Errors correspond to \pm SD.

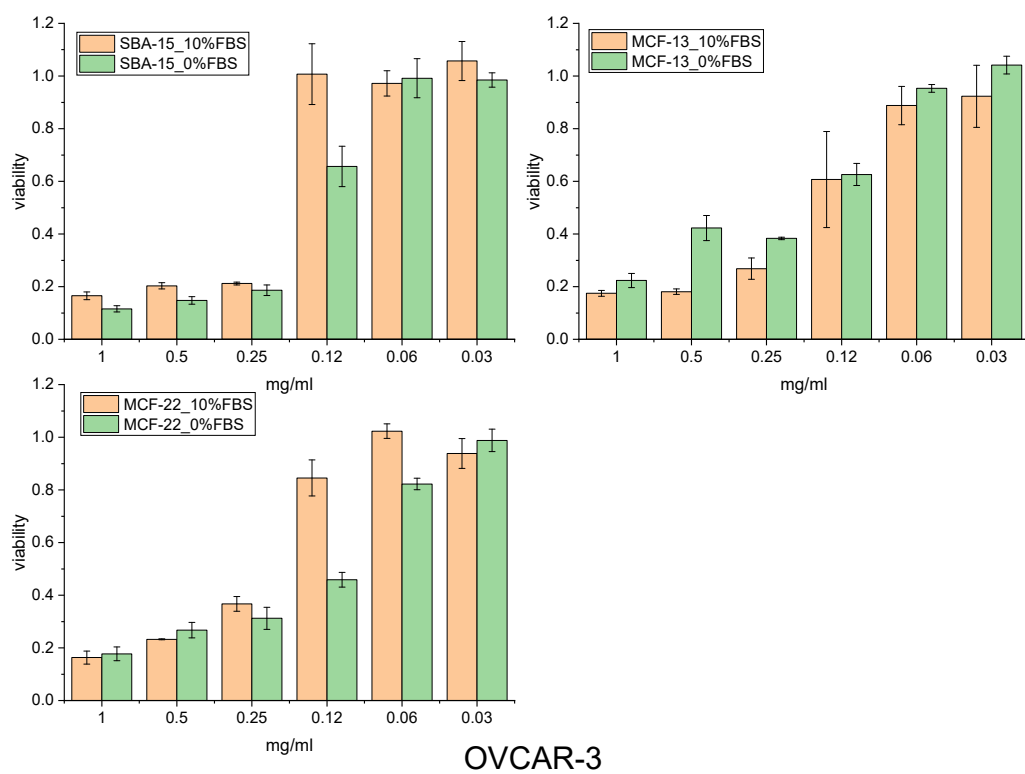


Figure S13. Bar plots of normalized viability values of OVCAR-3 exposed for 96 hours to MSN at different concentration, both in presence and absence of FBS. Errors correspond to \pm SD.

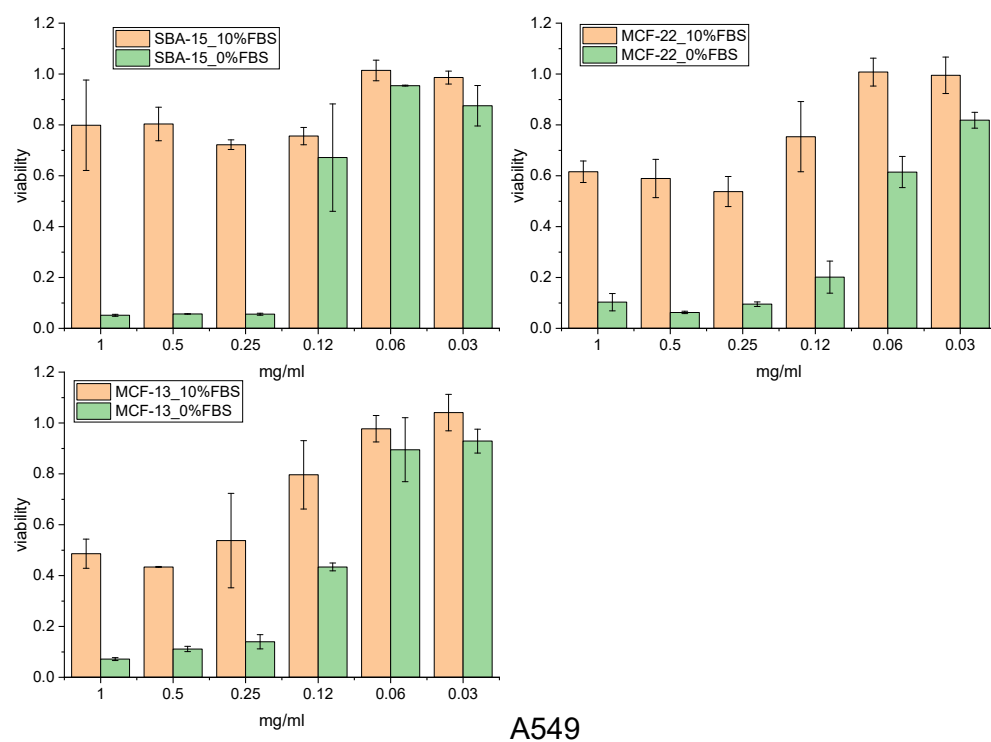


Figure S14. Bar plots of normalized viability values of A549 exposed for 96 hours to MSN at different concentrations, both in presence and absence of FBS. Errors correspond to \pm SD.

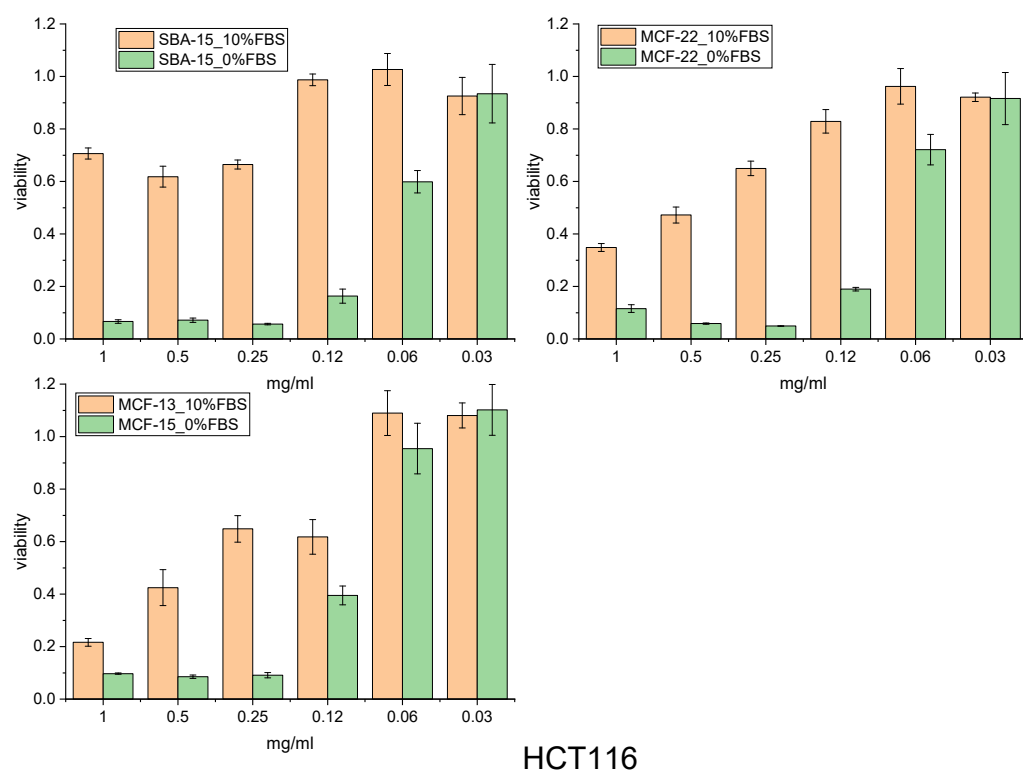


Figure S15. Bar plots of normalized viability values of HCT116 exposed for 96 hours to MSN at different concentration, both in presence and absence of FBS. Errors correspond to \pm SD.

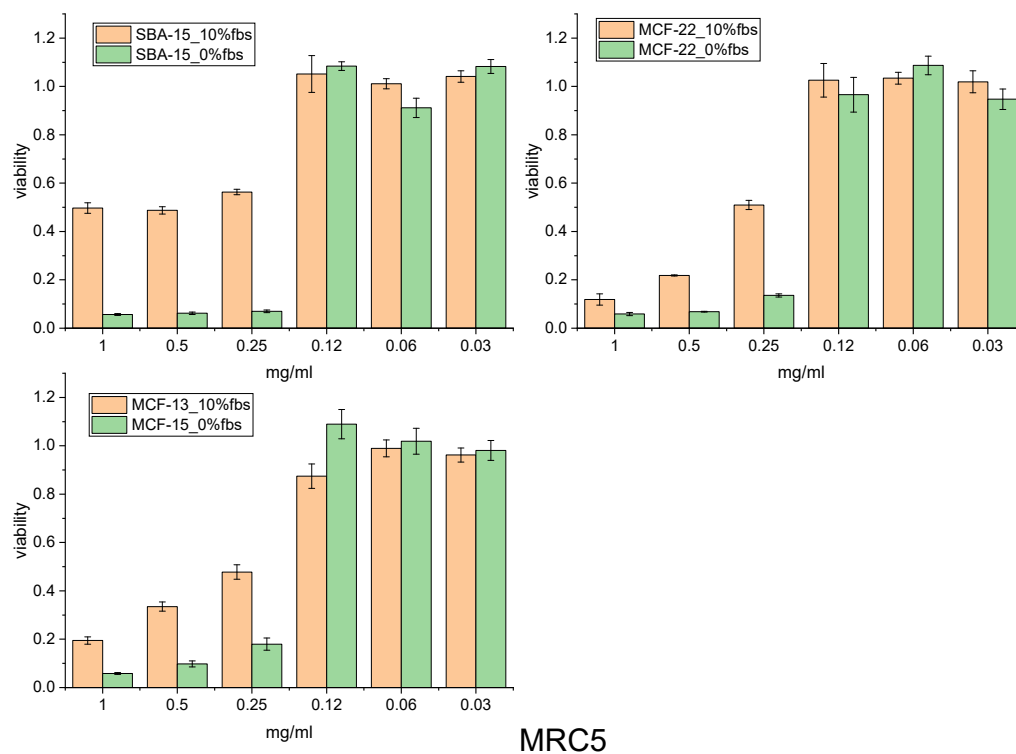


Figure S16. Bar plots of normalized viability values of MRC5 exposed for 96 hours to MSN at different concentrations, both in presence and absence of FBS. Errors correspond to \pm SD.

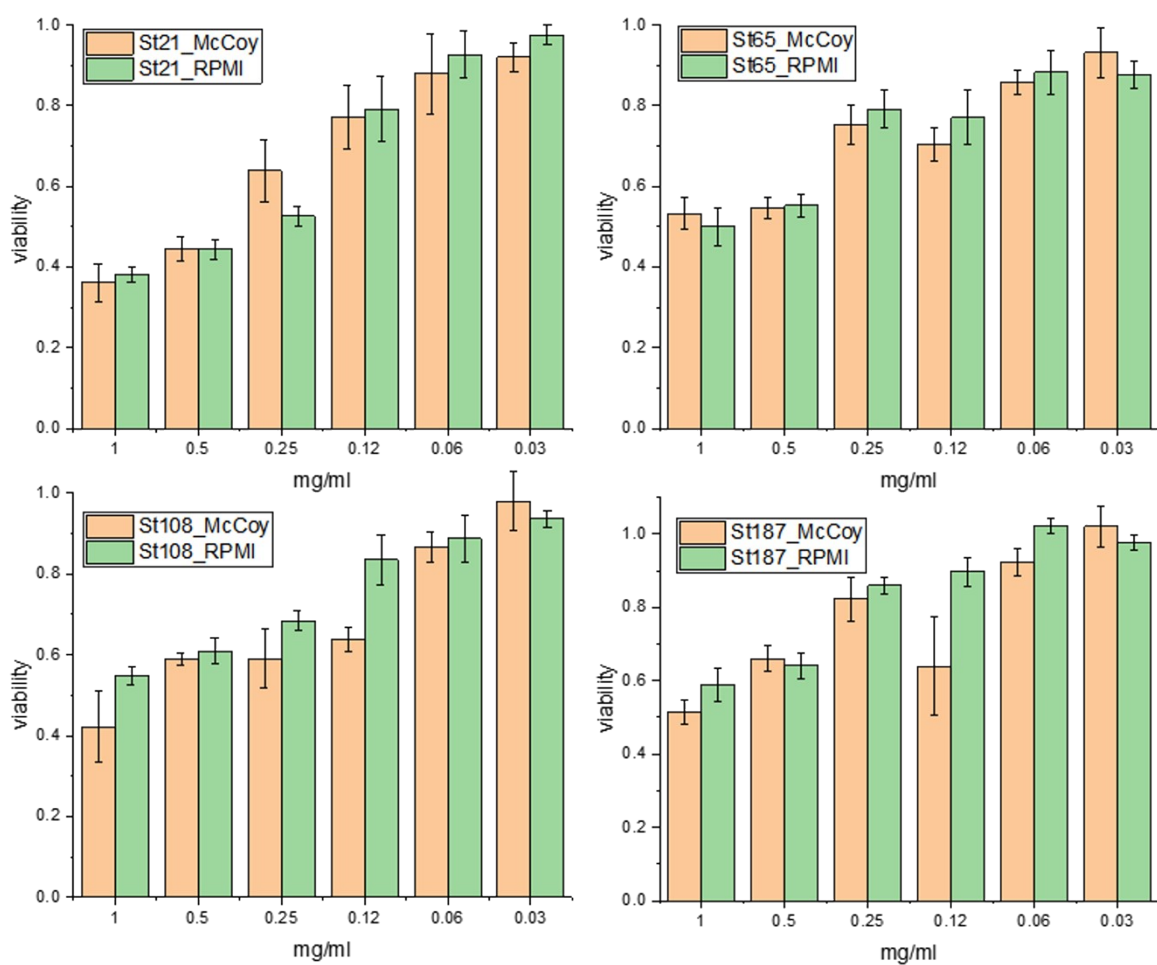


Figure S17. Bar plots of normalized viability values of HCT116 exposed for 96 hours to SiNPs, both in RPMI1640 and McCoy's 5A with 10% FBS. Errors correspond to \pm SD.

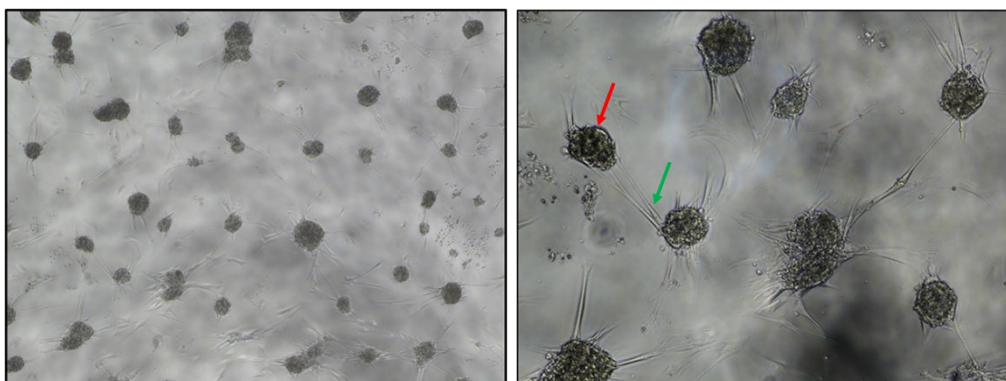


Figure S18 . Images of particles aggregation on MRC-5. MRC5 were exposed to 0.5mg/ml of MCF-13 for 96 hours in serum free condition (10x on the left and 20x on the right). Green arrow indicates fibroblast, red arrow indicates the aggregates of particles.

Table S4. *Inorganic salts composition of CCM*

Inorganic Salts	CCM (concentration reported as mM)			
	RPMI 1640	McCoy's 5A	MEM	Ham's F-12
Calcium nitrate (Ca(NO ₃) ₂ 4H ₂ O)	0.42372882			
Calcium Chloride (CaCl ₂) (anhyd.)		0.9009009	1.8018018	0.2992793
Magnesium Sulfate (MgSO ₄) (anhyd.)	0.407	0.8130081	0.8139166	0.6023158
Potassium Chloride (KCl)	5.3333335	5.3333335	5.3333335	2.9813335
Sodium Bicarbonate (NaHCO ₃)	23.809525	26.190475	26.190475	14
Sodium Chloride (NaCl)	103.44827	111.37931	117.24138	131.01724
Sodium Phosphate dibasic (Na ₂ HPO ₄) (anhyd.)	5.633803	4.2028985		1
Sodium Phosphate monobasic (NaH ₂ PO ₄ -H ₂ O)			1.0144928	
Zinc sulfate (ZnSO ₄ -7H ₂ O)	x	x	x	0.002996528
Ferric sulfate (FeSO ₄ -7H ₂ O)	x	x	x	0.003
Cupric sulfate (CuSO ₄ -5H ₂ O)	x	x	x	1.00E-05