Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supplementary data

ATP and NADPH as small coating molecules around iron oxide nanoparticles for the targeting of highly metabolic tumor cells

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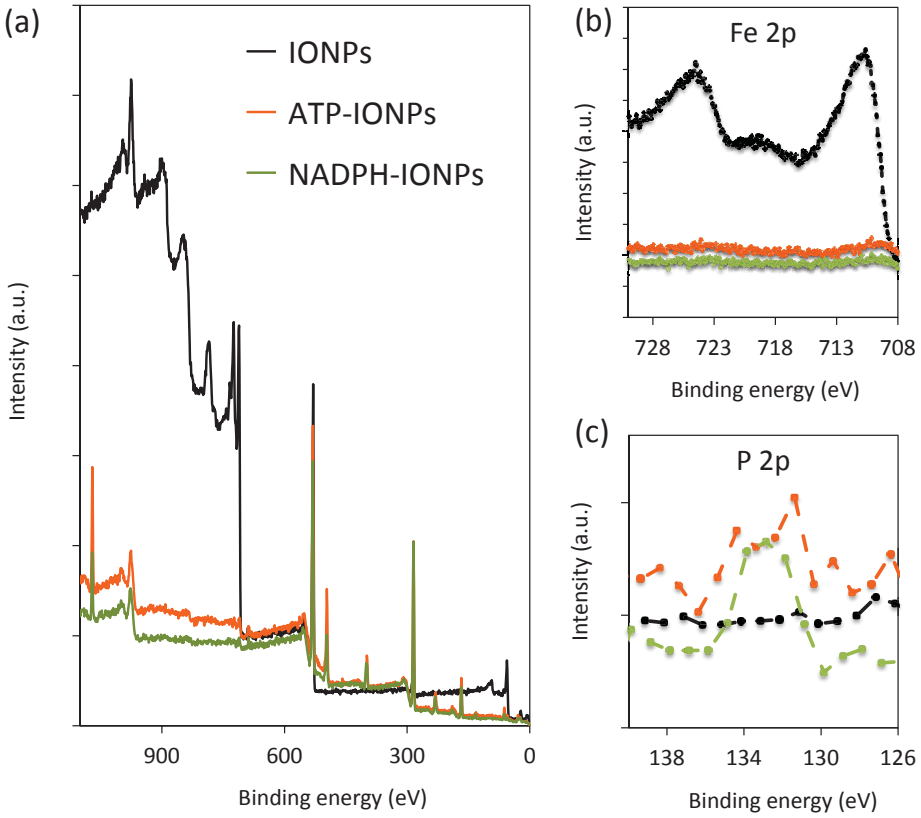

Fig. S1: Overall XPS spectra of uncoated IONPs, ATP-IONPs and NADPH-IONPs (a), as well as their Fe 2p (b) and P 2p (c) peaks.

Table S1: Atomic percentages of Fe, O, C and N obtained by XPS in uncoated IONPs, ATP-IONPs and NADPH-IONPs.

Atomic %	Fe 2p	O 1s	C 1s	N 1s	P 2p
IONPs	32.0	50.6	17.3	-	-
ATP-IONPs	1.2	34.9	55.6	7.4	1.0
NADPH-IONPs	0.6	31.5	58.0	9.0	1.0

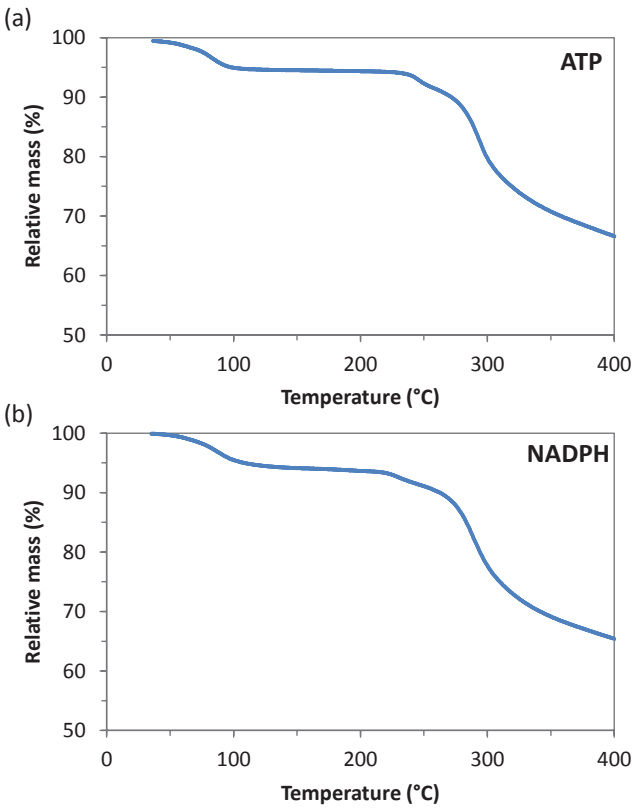

Fig. S2: TGA curves of ATP-IONPs (a) and NADPH-IONPs (b).

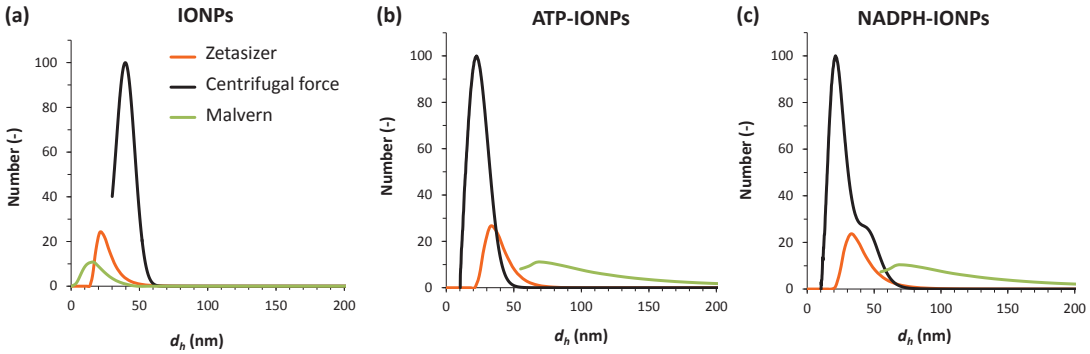

Fig. S3: Number weighted distribution of the hydrodynamic diameter, d_h, of uncoated IONPs (a), ATP-IONPs (b), and NADPH-IONPs (c) measured by dynamic light scattering with two instruments (Mastersizer or Zetasizer), or by centrifugal force.

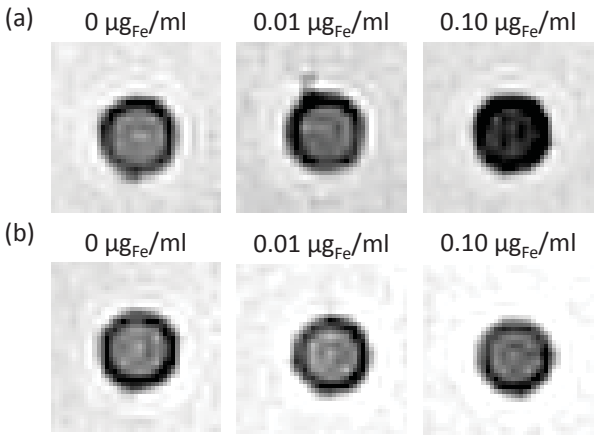

Fig. S4: MR images of LnCaP cells after incubation for 24h without (0 μg_{Fe} ml^{-1}) and with ATP-IONPs (a) or with NADPH-IONPs (b) at concentrations of 0.01 and 0.1 μg_{Fe} ml^{-1}.

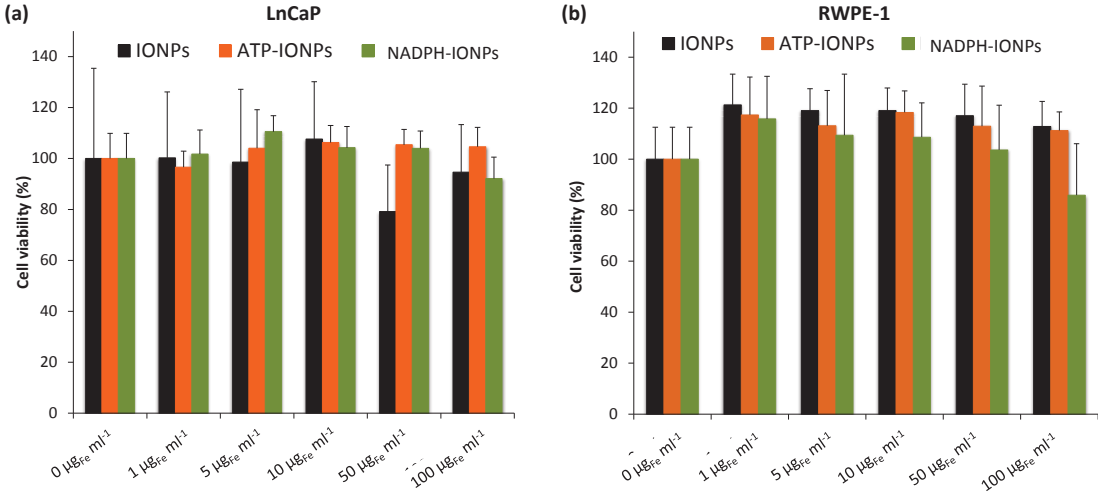

Fig. S5: Viability of LnCaP (a) and RWPE-1 (b) cells incubated for 24 h with different concentrations (0, 1, 5, 10, 50 and 100 μg_{Fe} ml^{-1}) of uncoated IONPs, ATP-IONPs and NADPH-IONPs measured by the MTS test. The cell viabilities are the percentages of the absorbance of cells treated with IONPs normalized with the absorbance of cells without IONPs (0 μg_{Fe} ml^{-1}).

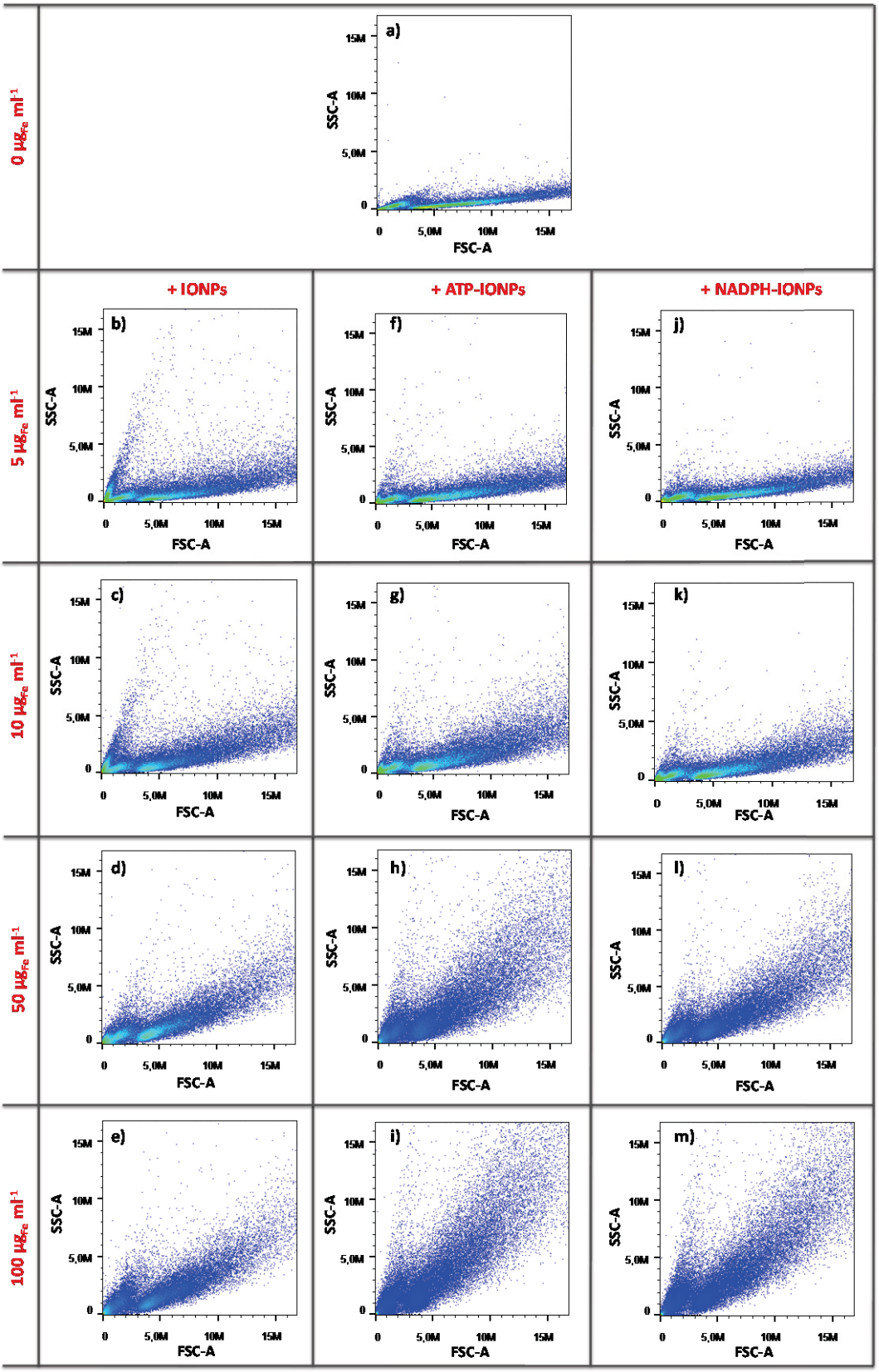

Fig. S6: Forward scatter (FSC) *vs* side scatter (SSC) plot of 22Rv.1 cells without IONPs (0 μg_{Fe} ml^{-1}; a) or treated for 24 h with different concentrations (5, 10, 50 and 100 μg_{Fe} ml^{-1}) of uncoated IONPs (b, c, d, e), ATP-IONPs (f, g, h, i) or NADPH-IONPs (j, k, l, m). SSC-A and FSC-A = area of the side and forward light scatter pulse.

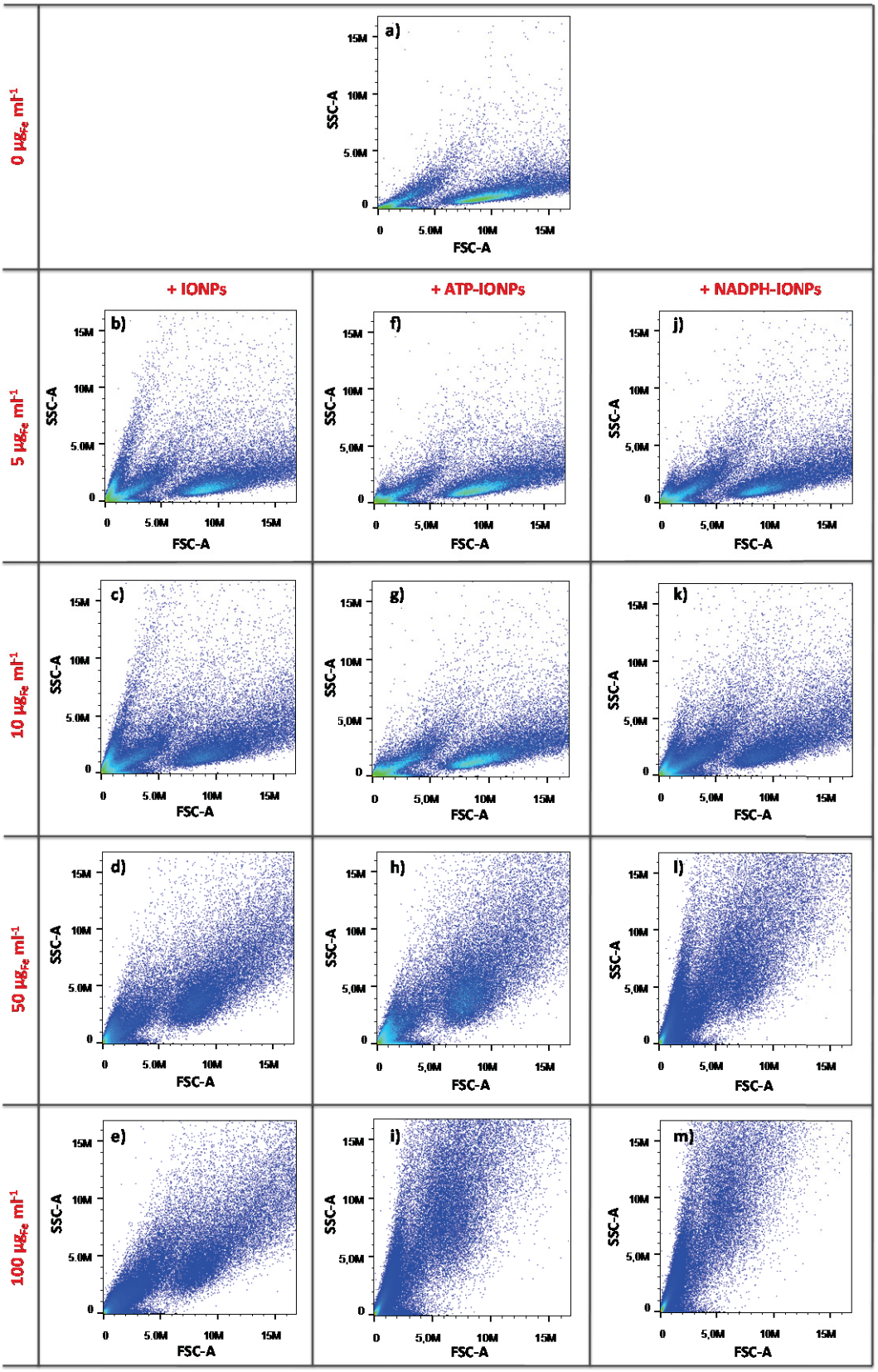

Fig. S7: Forward scatter (FSC) *vs* side scatter (SSC) plot of LnCaP cells without IONPs (0 μg_{Fe} ml^{-1}; a) or treated for 24 h with different concentrations (5, 10, 50 and 100 μg_{Fe} ml^{-1}) of uncoated IONPs (b, c, d, e), ATP-IONPs (f, g, h, i) or NADPH-IONPs (j, k, l, m). SSC-A and FSC-A = area of the side and forward light scatter pulse.

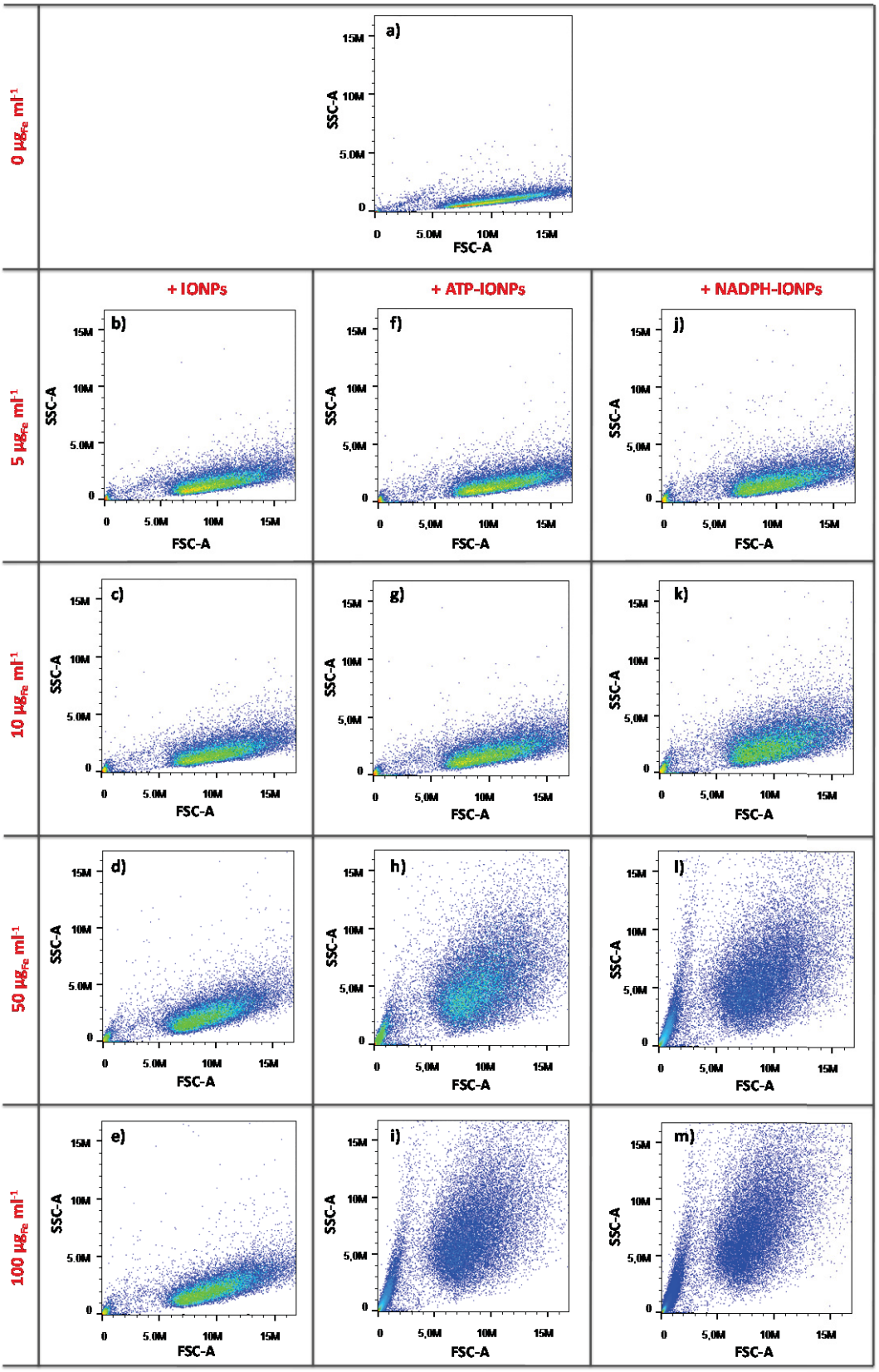

Fig. S8: Forward scatter (FSC) *vs* side scatter (SSC) plot of PC3 cells without IONPs (0 μg_{Fe} ml^{-1}; a) or treated for 24 h with different concentrations (5, 10, 50 and 100 μg_{Fe} ml^{-1}) of uncoated IONPs (b, c, d, e), ATP-IONPs (f, g, h, i) or NADPH-IONPs (j, k, l, m). SSC-A and FSC-A = area of the side and forward light scatter pulse.

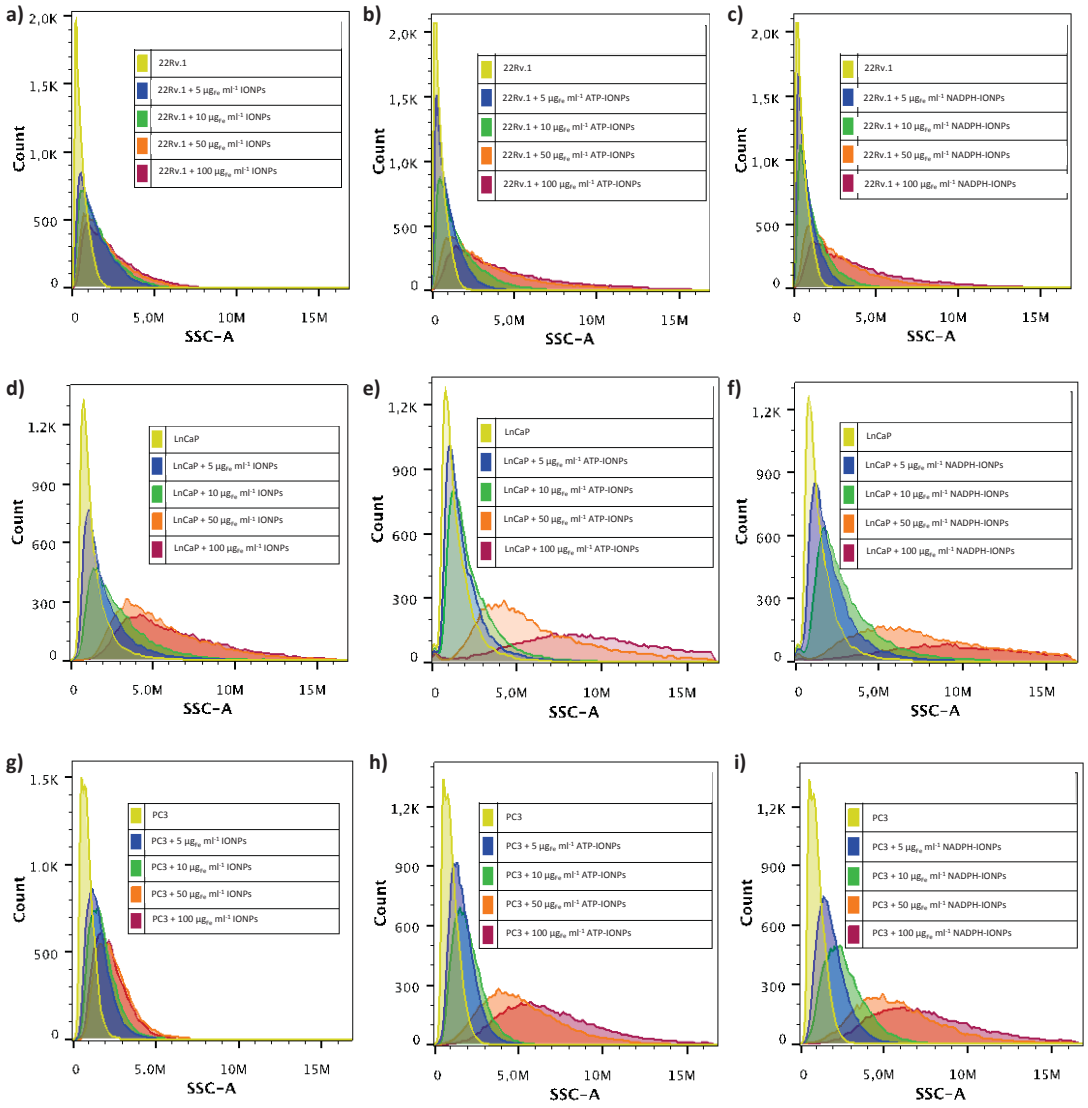

Fig. S9: Counts *vs* area of the side scatter (SSC-A) plot of 22Rv.1 (a, b,c), LnCaP (d, e, f) and PC3 (g, h, i) cells treated for 24 h with different concentrations (5, 10, 50 and 100 μg_{Fe} ml^{-1}) of uncoated IONPs (a, d, g), ATP-IONPs (b, e, h) and NADPH-IONPs (c, f, i). Data from experiments selected in Fig. S4, S5 and S6.

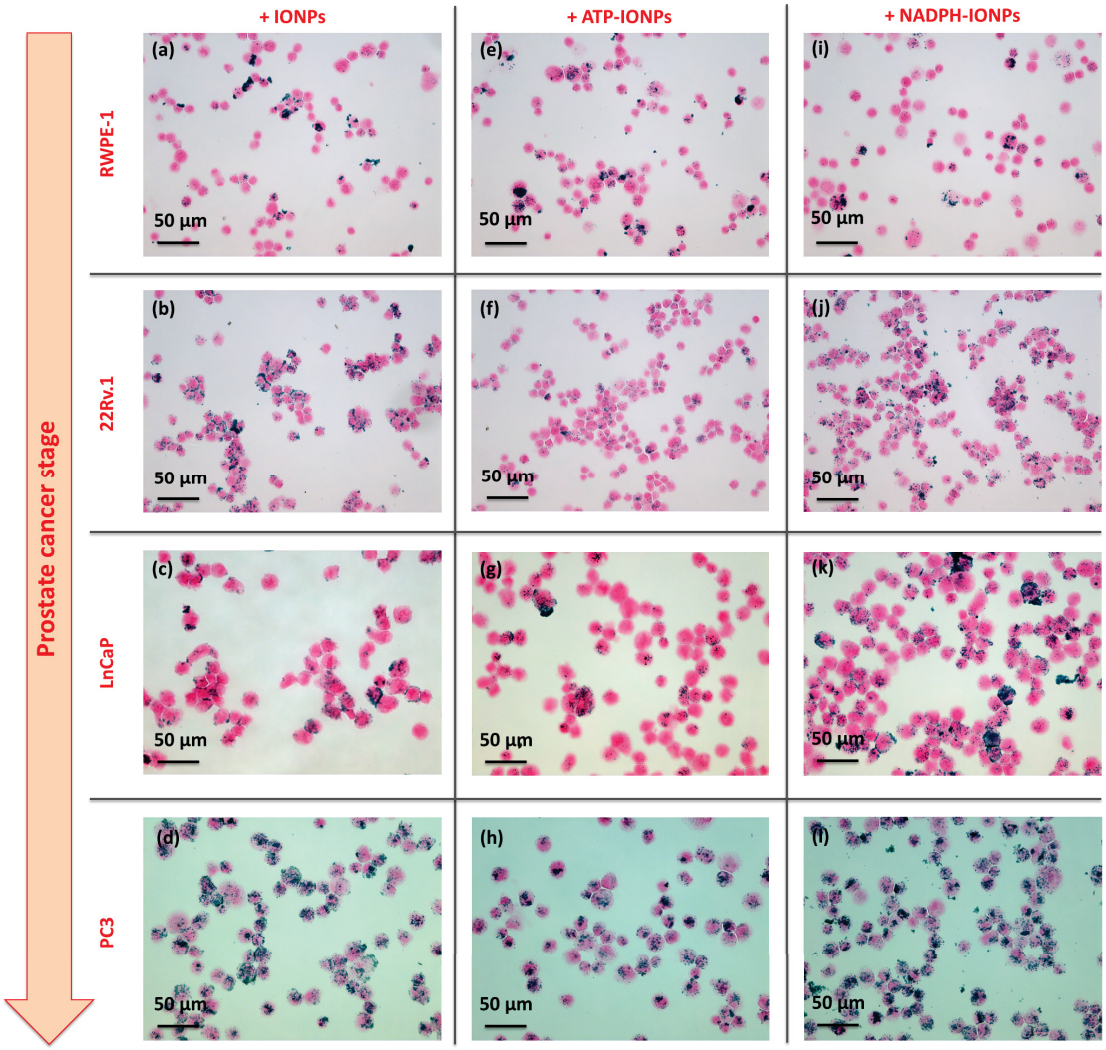

Fig. S10: Transmitted light microscopy micrograph of RWPE-1 (a, e, i), 22Rv.1 (b, f j), LnCaP (c, g, k) and PC3 (d, h, l) incubated for 24 h with 10 μg_{Fe} ml^{-1} of uncoated IONPs (a, b, c, d), ATP-IONPs (e, f, g, h) or NADPH-IONPs (I, j, k, l). Cells were stained with Nuclear Fast Red (light pink staining) and Prussian Blue (dark blue staining), highlighting the cellular cytoplasm and the iron, respectively.

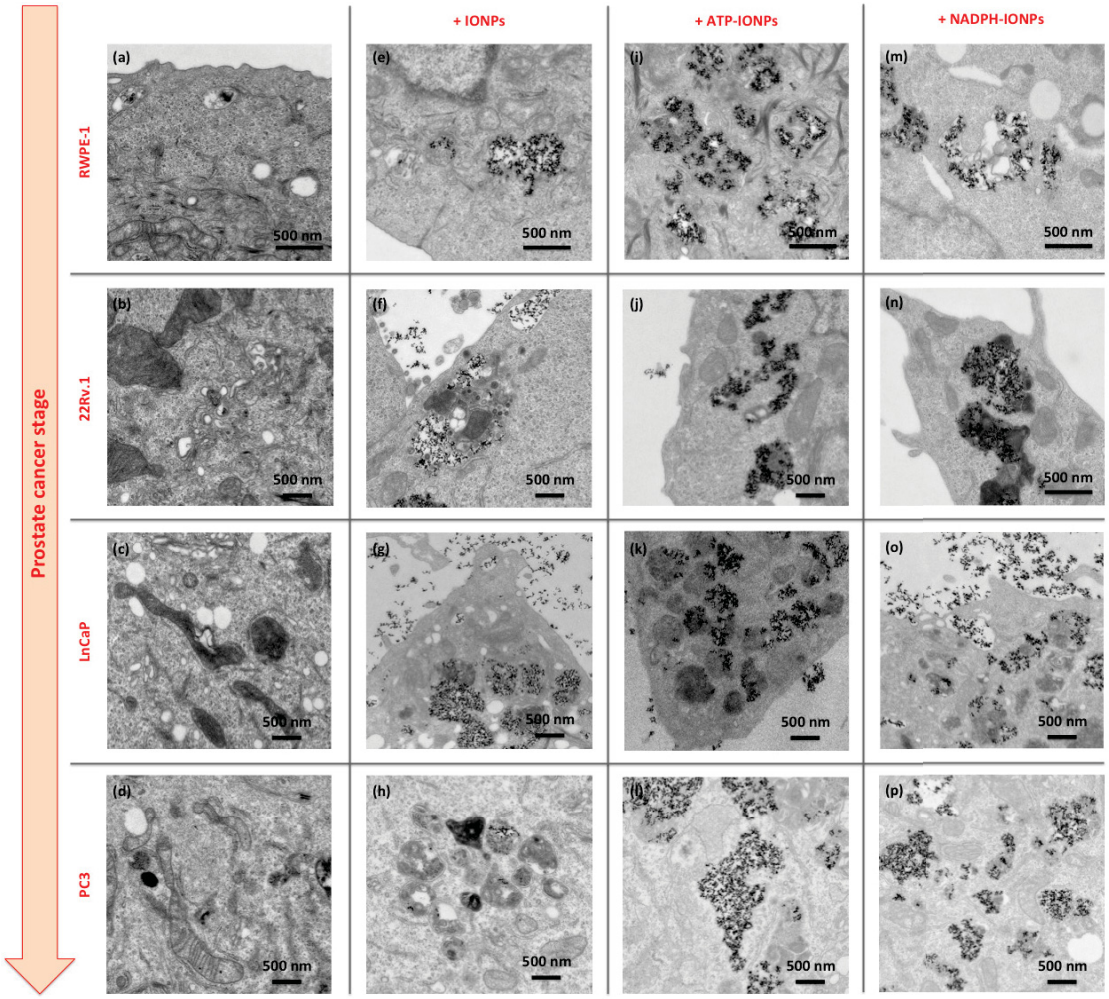

Fig. S11: Representative TEM micrographs of 50 nm-thick cross-sections of RWPE-1 (a, e, j, m), 22Rv.1 (b, f, j, n), LnCaP (c, g, k, o) and PC3 (d, h, l, p) cells incubated with uncoated IONPs (e, f, g, h), ATP-IONPs (i, j, k, l) and NADPH-IONPs (m, n, o, p) and embedded in resin.