

## Spatially-resolved profiling of carbon nanotube uptake across cell lines

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Electronic Supplementary Information:

### S1 – Representative images of CNT-cluster positive cells

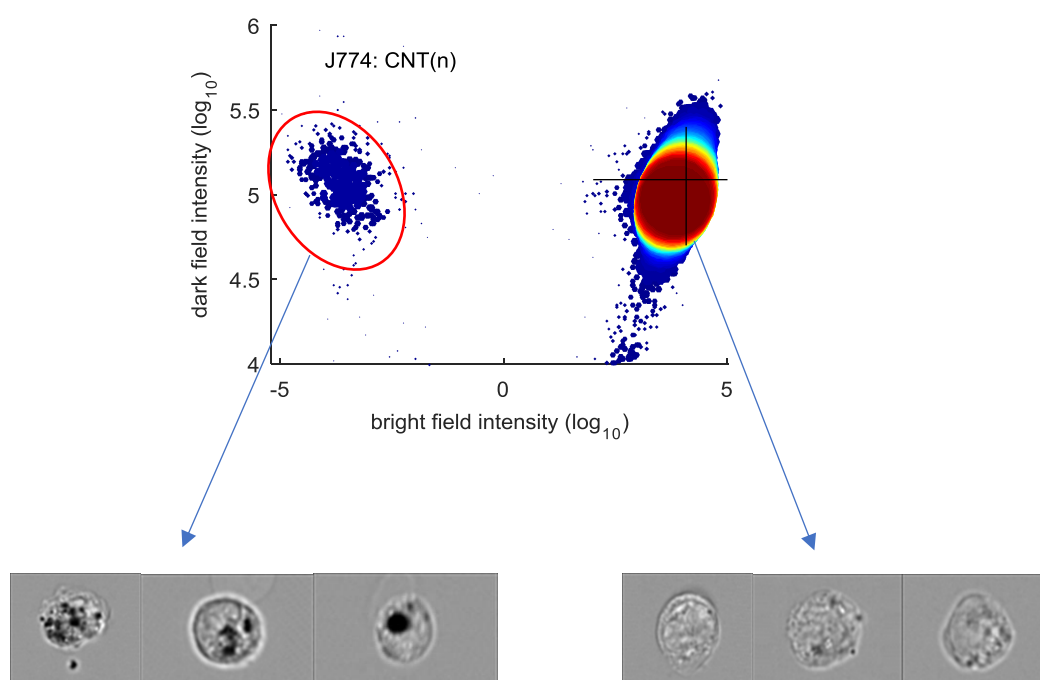


Figure S1: Representative images from CNT-cluster positive cells (indicated by red ellipse) and the remaining, majority population, in which the CNT dose is in diffuse form.

## S2 – Correlation of darkfield and brightfield signal after 72 hrs exposure to CNT(++) preparation

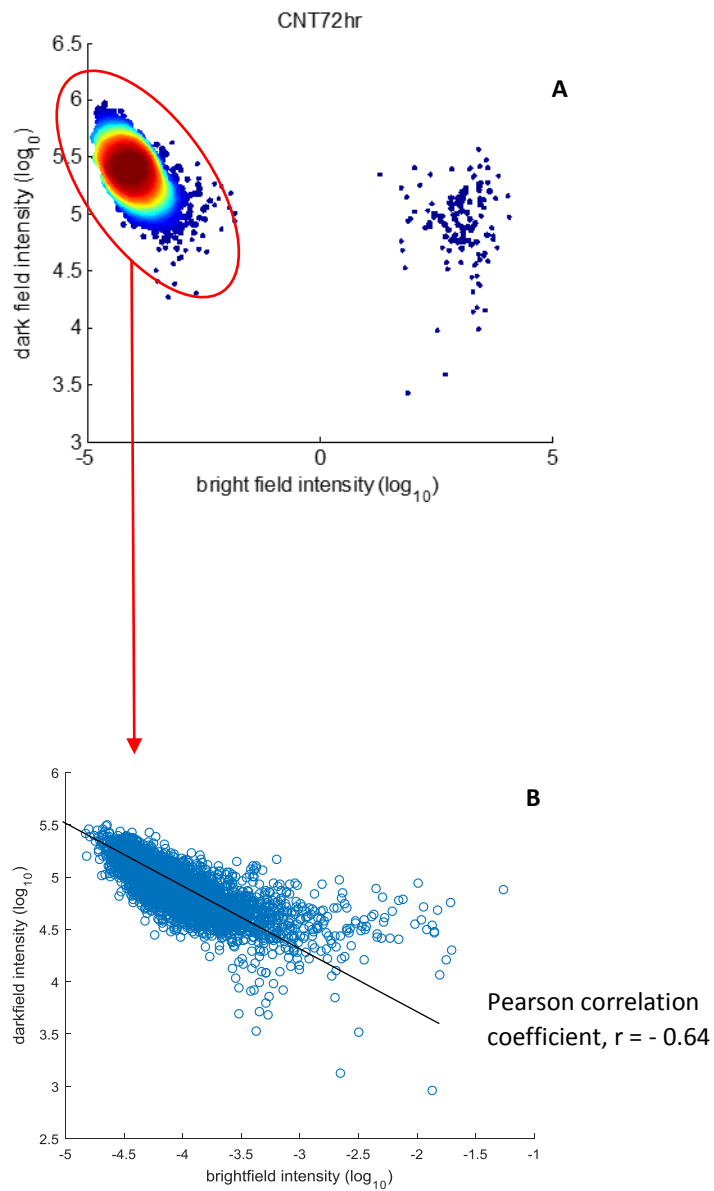


Figure S2: A.) darkfield vs brightfield intensity for J774 cells exposed for 72 hours to polycationic dendron-functionalised CNTs (CNT(++)). The red ellipse identifies the CNT-cluster +ve sub-group. B.) correlation plot for CNT-cluster +ve cells of darkfield and brightfield signals.

**Table S1 Dynamic light scattering and zeta potential measurements of CNT(n)**

Size (nm) <sup>[a], [b], [d]</sup>	PDI <sup>[a], [b]</sup>	Zeta Potential (mV) <sup>[b], [c], [d]</sup>
945.9 ± 210.6	0.479	--0.0182 ± 4.29

[a] Hydrodynamic diameter measured in deionized water by dynamic light scattering

[b] Results do not meet quality criteria

[c] Analysed by laser Doppler electrophoresis and measured in deionized water

[d] Data are represented as mean ± SD

The hydrodynamic size (Z-Average), polydispersity index (PDI) and zeta potential of CNT(n) dispersion were determined by NanoZS (Malvern Instrument, UK) at 25 °C. Disposable square polystyrene cuvettes and disposable capillary cells (Malvern Instrument, UK) were used for size/PDI and zeta potential, respectively. The Z-Average diameter was measured in water and presented as the average value of three measurements, with 15 runs within each measurement. The zeta potential was measured in water and presented as the average value of three measurements, with 20-25 runs within each measurement. The mean and standard deviation (SD) of size and zeta potential were calculated for each sample.

### S3 – Transmission electron microscopy of Dendron functionalized CNT

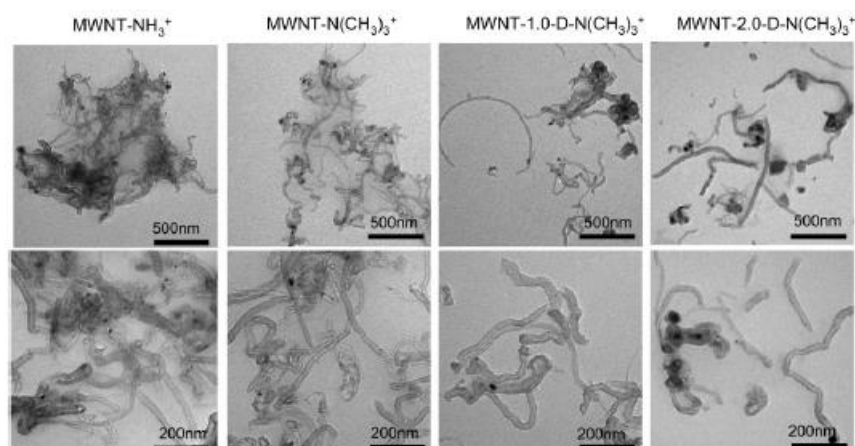


Figure S3: TEM of f-MWNT aqueous dispersions. TEM images of f-MWNTs at 250  $\mu\text{g ml}^{-1}$  concentration showing an increase in the dispersibility and individualization of f-MWNT. Images from - Al-Jamal KT et al. 2010 Enhanced cellular internalization and gene silencing with a series of cationic dendron-multiwalled carbon nanotube:siRNA complexes. *FASEB J.* 24, 4354–4365. (doi:10.1096/fj.09-141036)

The increased alkylation of the CNTs resulting from the growth of dendritic molecules (moving from left to right across the image panels) clearly leads to enhanced dispersion of the particles. Thus the cationic dendron functionalised nanotubes (referred to as CNT(++) and CNT(+)) in manuscript) are delivered to cells as single nanotubes or in loose clusters if a dimension < 500 nm.