Supporting information

Bacterial growth and nucleic acids production

Bacterial growth was carried out at 37 ˚C using Terrific Broth medium (12 g/L tryptone, 24 g/L yeast extract, 4 mL/L glycerol, 0.017 M KH_2PO_4, and 0.072 M K_2HPO_4) supplemented with 50 µg/mL kanamycin. The growth was kept for 8 h for low molecular weight RNA production or 16 h for pDNA production. Cells were recovered by centrifugation at 3900 g for 10 min at 4 ˚C and stored at –20 ˚C.

Analytical chromatography

For the chromatographic experiments, the analytical column was equilibrated with 95 % of 0.6 M NaCl in 100 mM Tris-HCl pH 8.0 and 5 % of 1 M NaCl in 100 mM Tris-HCl pH 8.0, at a flow rate of 1 mL/min. Subsequently, pDNA samples were injected at the same flow rate, and the absorbance of the eluate was continuously monitored at 260 nm. After 3 min, a linear gradient of 70 % of 1 M NaCl in 100 mM Tris-HCl pH 8.0 for 7 min was applied. A washing step was performed using 1 M NaCl in 100 mM Tris-HCl pH 8.0 for 2 min. Regeneration of the column was achieved by adding 2 M NaCl in 100 mM Tris-HCl pH 8.0 for 2 min to remove bound substances from the stationary phase; it was then followed by re-equilibration of the column with the appropriated counter-ion by applying 95 % of 0.6 M NaCl in 100 mM Tris-HCl pH 8.0 and 5 % of 1 M NaCl in 100 mM Tris-HCl pH 8.0 for 6 min.

Genomic DNA quantification

For the qPCR reaction specific primers for the 16S ribosomal RNA (rRNA) gene were used (forward primer - 5'-ACACGGTCCAGAACTCCTACG-3′; and reverse primer - 5′-CCGGTGCTTCTTCTGCGGGTAACGTCA-3′). The reaction conditions were 95 ˚C for 10 min for initial denaturation, followed by 40 cycles of 95 ˚C for 10 sec, 60 ˚C for 30 sec, and 72 ˚C for 15 sec. In the end, the samples were incubated at 65 ˚C for 5 sec with an increment of 0.5 ˚C until 95 ˚C for the melting curves.

Circular Dichroism spectroscopy

CD spectra were acquired at a constant temperature of 20 ˚C using a scanning speed of 50 nm/min, with a response time of 1 s over wavelengths ranging from 210 to 320 nm. The recording bandwidth was 1 nm with a step size of 1 nm using a quartz cell with an optical path length of 1 mm.

Determination of pristine MWCNTs cytotoxicity by 3-[4,5-dimethyl-thiazol-2-yl]-2,5-diphenyltetrazolium bromide (MTT) assay

The absorbance measurements were performed in a microplate reader at 570 nm. The relative cell viability (%) was calculated by comparing each well to the negative control ($A_{test}/A_{control} \times 100$, where A_{test} is the absorbance of the test sample and $A_{control}$ is the absorbance of the negative control sample). The data are expressed as mean ± standard error. Quantitative data were statistically analyzed by One-Way Analysis of Variance (ANOVA), followed by Turkey's multiple comparison test. Asterisk "*" indicates a significant difference in comparison to untreated cells.