

Supporting Information

Uptake and Depuration of Carbon- and Boron Nitride-Based Nanomaterials in the Protozoa *Tetrahymena thermophila*

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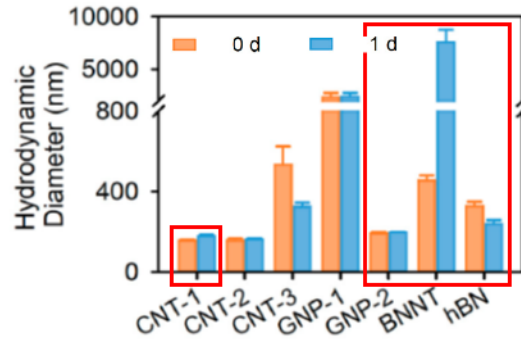


Fig. S1. Stability of alginic acid-dispersed multiwall carbon nanotubes (CNT), graphene nanoplatelets (GNP), boron nitride nanotubes (BNNT), and hexagonal boron nitride flakes (hBN) in Dryl's medium over one day, based on the hydrodynamic diameter as measured by dynamic light scattering (DLS). Data bars are mean \pm SE ($n = 3$). The figure is partially reprinted from Wang et al., 2018¹. Red frames mark the data for the ENMs used in the current study. Note that the measurements were done at 0 and 1 day, which is a longer time frame than the exposure time of *T. thermophila* to ENMs during uptake experiments in the current study (1 hour).

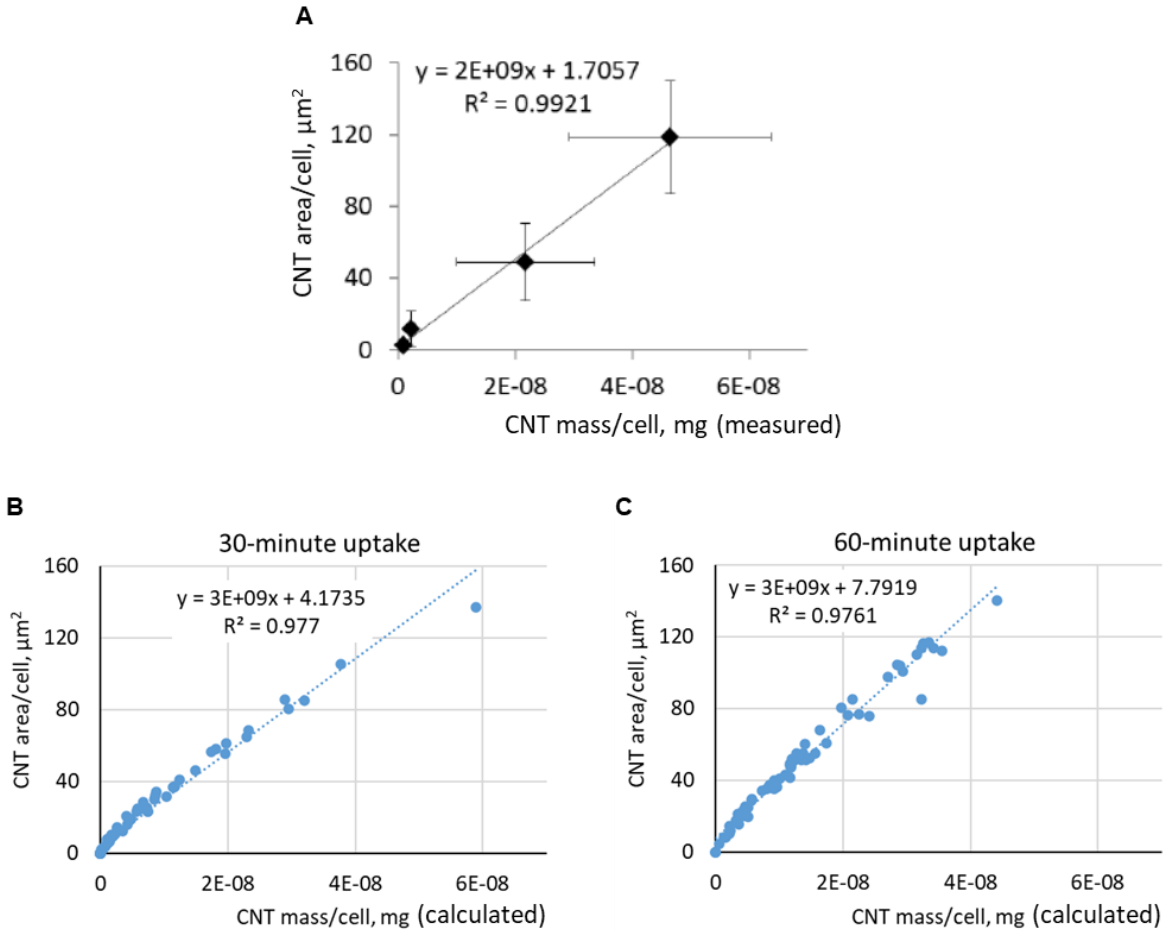


Fig. S2. Linear regression between the CNT area (μm^2) and CNT mass (mg) per *T. thermophila* cell. Total CNT area within protozoan food vacuoles per cell (measured in the Nomarski microscopy images using ImageJ) versus (A) measured CNT mass per cell (using liquid scintillation counting of ^{14}C -labeled CNTs) in Mortimer et al., 2016² and versus calculated CNT mass per cell after (B) 30-minute uptake and (C) 60-minute uptake in this study. The calculations based on the CNT areas per cell in this study yielded CNT masses per cell (B and C) in the same order of magnitude as previously analytically measured CNT masses (A),² confirming the accuracy of the image analysis and calculation-based approach in the current study.

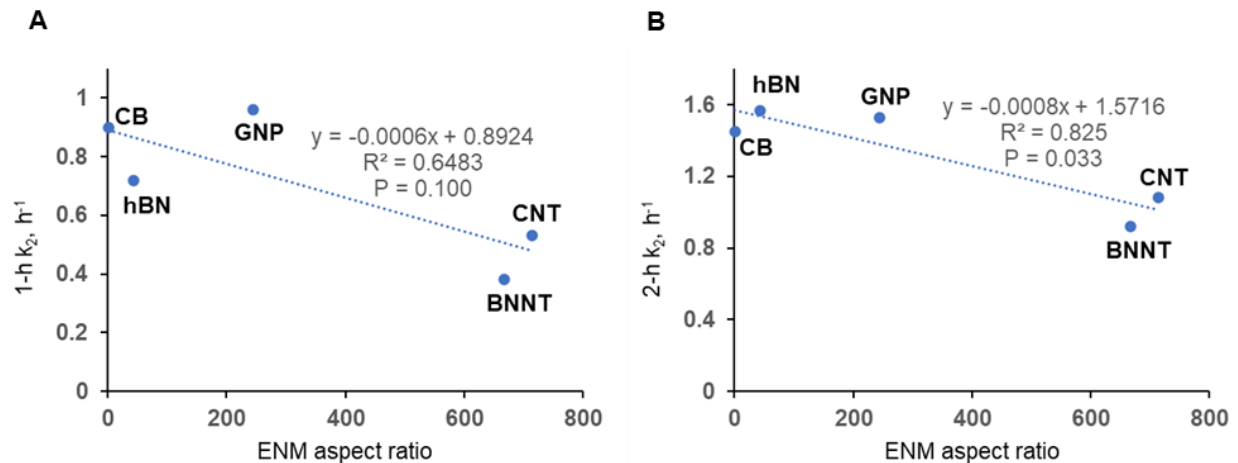


Fig. S3. Linear regression between the engineered nanomaterials (ENM) aspect ratios (Table 1) and mean depuration rate coefficients (k_2) calculated over (A) 1 h or (B) 2 h of depuration (Table 3). CNT – multiwall carbon nanotubes; GNP – graphene nanoplatelets; hBN – hexagonal boron nitride flakes; BNNT – boron nitride nanotubes; CB – carbon black.

References

1. Y. Wang, M. Mortimer, C. Chang and P. Holden, Alginate Acid-Aided Dispersion of Carbon Nanotubes, Graphene, and Boron Nitride Nanomaterials for Microbial Toxicity Testing, *Nanomaterials*, 2018, **8**, 76.
2. M. Mortimer, E. J. Petersen, B. A. Buchholz, E. Orias and P. A. Holden, Bioaccumulation of multiwall carbon nanotubes in *Tetrahymena thermophila* by direct feeding or trophic transfer, *Environ. Sci. Technol.*, 2016, **50**, 8876-8885.