

Supplementary Files

Supplementary File S1. A: Correspondence of our samples to the COI haplotypes in phylogenetic tree by Novo et al. (2015). C indicates container, W indicates number of worm. Samples highlighted in bold and italics were the ones whose transcriptomes were sequenced for differential expression analyses. B: Number of reads sequenced for each of the samples, and percentage of mapped reads.

Supplementary File S2. Figure: TEM images of 30 nm ZnO NP analysed from the storage container at the beginning of the experiments. These are identical particles to those used in Heggelund et al 2014; Nanoparticles sampled from (a) the top and (b) bottom of storage container, (c) is the original TEM image from Heggelund et al 2014. Table: Characterisation data for ZnO NP with XRD, BET and density measurements

Supplementary File S3. The pH and zinc concentration in the pore waters in the ionic and NP exposures. The total pore water concentration is the pore water extracted through the glasswool and the UF Zn is the ultra-filtered (10 kDa) pore water concentrations.

Supplementary File S4. The survival of earthworm and their body concentrations of zinc exposed to ionic Zn and ZnO NPs after 28 days in soil.

Supplementary File S5. The reproduction of earthworms exposed to ZnO NPs and ionic Zn in Lufa 2.2 soils after 56 days exposure. Exposure was based on the total concentration of Zn in the soil. The symbols represent the reproduction (juveniles per worm per week) for each replicate at each concentration and the solid line represents the logistic model fit.

Supplementary File S6. List of differentially regulated transcripts according to EdgeR (only those with $P < 0.05$ are shown) together with EdgeR and Blast metrics and hits. Each comparison is shown in a different excel tab.

Supplementary File S7. Output of the enrichment analyses in DAVID where the list of genes contributing to GO terms is shown. Each comparison is shown in a different excel tab. Enrichment terms with P values < 0.05 are shown in black, those with FDR < 10 are shown in bold and those with P values > 0.05 are shown in grey.

Supplementary File S8. REVIGO graphics ($P < 0.05$) of the different comparisons including only DAVID terms with FDR < 10 . Common upregulated and downregulated terms by ionic Zn and NPs have been analysed separately.