Table S1. Summary information of the characteristics of the tested materials in terms of supplier, state, solubility, coating, nominal size (according to the supplier), size measured via TEM or SEM (Transmission or Scanning Electron Microscopy) measurements, purity and morphology. PVP: polyvinylpyrrolidone, w/w: wet weight.

Table S2. Primer sequences used for the qPCR confirmations.

Table S3. List of genes confirmed by qPCR in each test condition.

Table S4. List of all the differentially expressed genes in at least one condition (BH adjusted, p-value < 0.05) with the M value (log2 fold change) and adjusted p value for each treatment, and the GO annotation for each gene.

Table S5. List of significantly enriched (Fisher's Exact Test p < 0.05) Gene Ontology terms at the EC20 and EC50 (reproduction effect concentrations) of silver nitrate (AgNO3) and three silver nanomaterials: PVP-AgNPs, NC-AgNPs and Ag NM300K, after 3 and 7 days of exposure, used for discussion. GO: Gene Ontology; #Sig: number of significant sequences; #Annot: number of annotated sequences; d: days.

Table S6. List of Biological processes (GO terms) affected by the DEGs in each treatment after Enrichment Analysis (Fisher's Exact Test, Blast2GO).

Figure S1. Heat map of samples, hierarchically clustered using Pearson' Uncentered and average linkage, based on the 12493 differentially expressed genes (DEG) (adjusted p-value < 0.05) from *Enchytraeus crypticus* exposed to the different silver forms for 3 and 7 days.

Figure S2. Dendrogram of samples, hierarchically clustered using Pearson' Uncentered and average linkage, based on the 12000 and 1524 differentially expressed genes (adjusted *p*-value < 0.05) from *Enchytraeus crypticus* exposed for 3 days (A) and for 7 days (B), respectively to silver nitrate (AgNO$_3$) and silver nanomaterials: PVP-AgNPs, NC-AgNPs and Ag NM300K. EC20, 50: reproduction effective concentration of 20% and 50%; d: days.
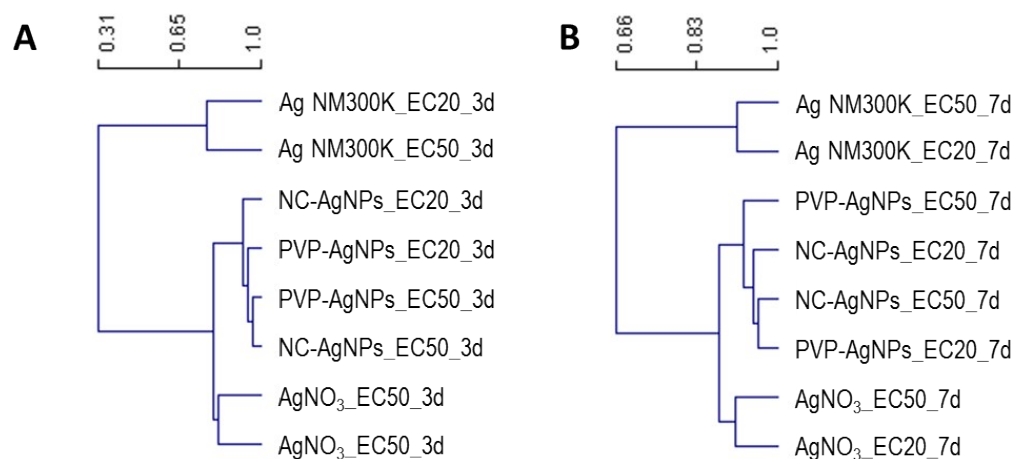
Figure S3. Adverse Outcome Pathway (AOP) for *Enchytraeus crypticus* when exposed to silver nitrate (AgNO$_3$) and three silver nanomaterials: PVP-AgNPs, NC-AgNPs and Ag NM300K in LUFA 2.2 soil based on transcript-expression data. Square boxes represent final states for the organism and rounded boxes represent intermediate states. *from Ribeiro et al. (2015).