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Abstract – SY29

STRUCTURAL MAINTENANCE, FUNCTION AND ABUNDANCE OF ORGANELLE GENETIC MATERIAL IN PLANTS EXPOSED TO ENGINEERED NANOMATERIALS

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One of the challenges restricting the commercial development of engineered nanomaterials (ENMs) is the perceived lack of understanding of their negative environmental effects. Although evidence has been accumulating on the biological effects of ENMs at the level of cells, tissues, and organisms, wide differences in experimental design confound a systemic analysis. Importantly, mitochondria and chloroplast are not only the cellular energy sources but also have important regulatory and developmental roles in cell function. Experimental data has shown that mitochondria and chloroplasts are sensitive targets of metal-based ENMs exposure. The aim of this work was to examine mechanistically and compare mitochondria and chloroplast involvement in response to a number of different ENMs and relative metal ions at a range of concentrations, both in terms of their functionality and their organellar DNA replication, as measured by specific genes of interest. The correlation of physiological endpoints with organelle functionality and the organellar DNA copy number aims to provides novel insights into the organelles involvement in plant response to ENMs exposure. This work highlights that organellar genomes can be subjected to stoichiometric or sub-stoichiometric shifts as a morpho-functional response to the physiological imbalances caused from the ENM or metal exposure.