

Title: Glucose Reduced Nano-Se Mitigate Cu-Induced ROS by Upregulating Antioxidant Gene in Zebrafish Larvae

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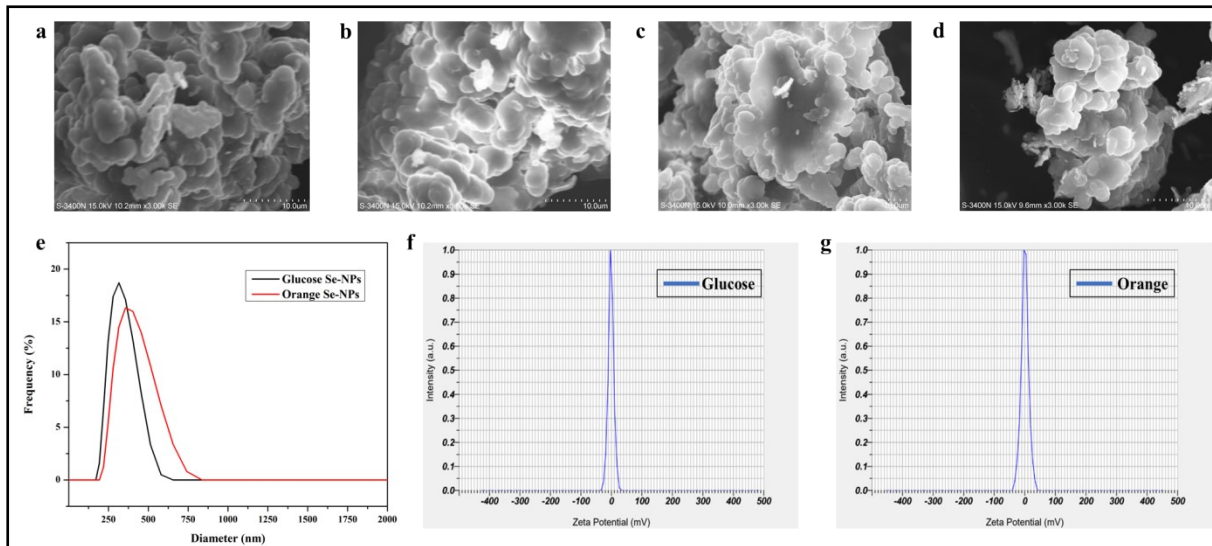
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Running Head: Mussel-extracted Nano-Se as Therapeutics

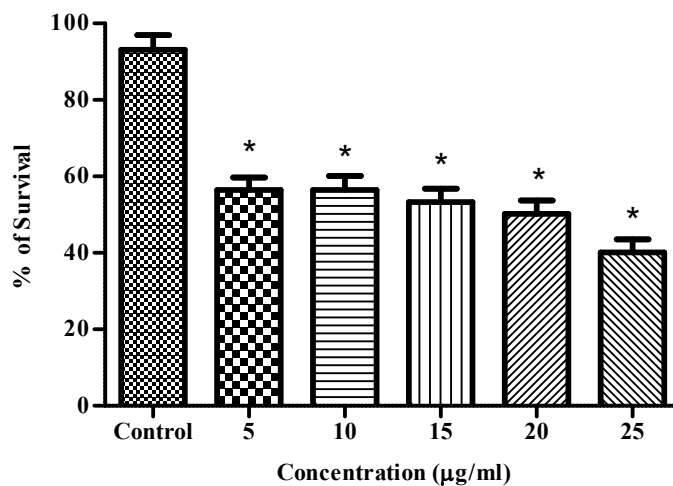
Keywords: Oxidative Stress, Nano-Se, Zebrafish Model, Antioxidant, Cognitive, Neurodegenerative Diseases

Supplementary Table 1: Key Chemical Attributes of Selenium Nanoparticles

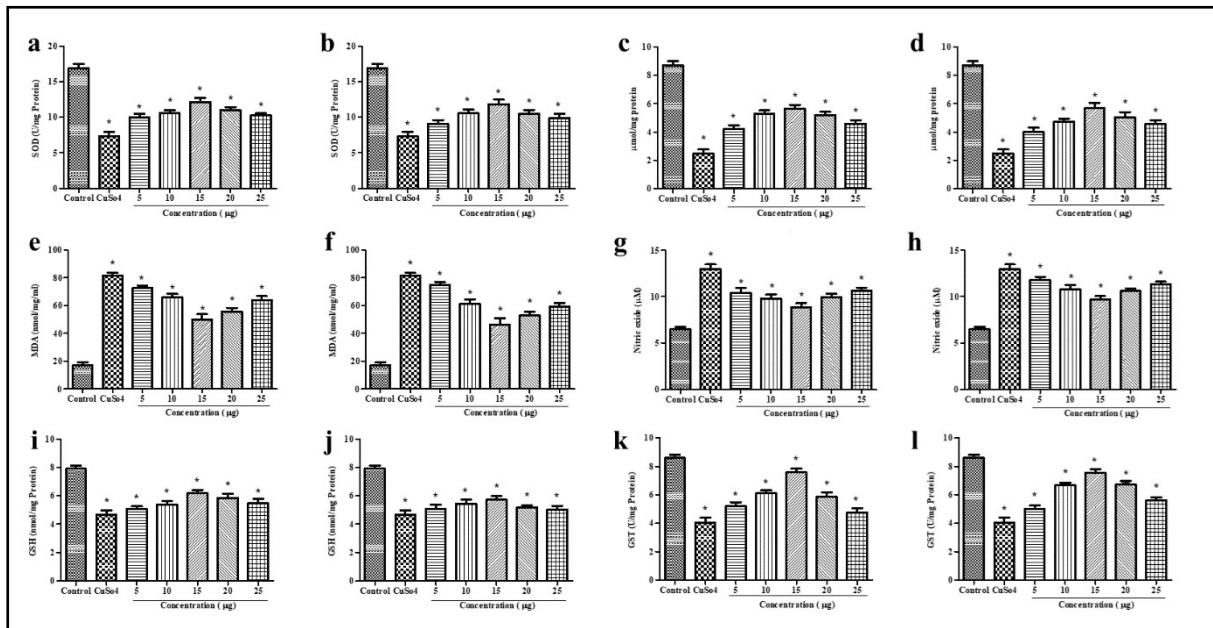
Wavenumber (cm ⁻¹)	Functional Group	Chemical Attribute
3279–3273	C-H stretching	Alkene
2924–2850	C-H stretching	Alkane
1627	C=C stretching	Di-substituted alkene
1532–1515	N-O stretching	Nitro compound
1405–1392	S=O stretching	Sulfonyl chloride
1236–1228	C-O stretching	Alkyl aryl ether
1037–1031	S=O stretching	Sulfoxide
518–404	Metal-ligand stretching	Selenium-metal interactions



Supplementary Figure 1: SEM (a-b) Non-stabilized Se-NPs reduced for 30 minutes and 1hour; (c-d) Non-stabilized Se-NPs reduced for 30 minutes and 1 hour with orange. DLS (e) stabilized Se-NPs reduced for 30 minutes with D-glucose and orange. Zeta potential (f) stabilized Se-NPs reduced for 30 minutes with D-glucose, (g) stabilized Se-NPs reduced for 30 minutes with orange.



Supplementary Figure2: Survival Rate of Zebrafish Embryo Treated with Selenium



Supplementary Figure 3: SOD assay (a-b) reduced with orange peel extract for 30 minutes and 1 hour. CAT assay (c-d) reduced with orange peel extract for 30 minutes and 1 hour. LPO assay (e-f) reduced with orange peel extract for 30 minutes and 1 hour. NO assay (g-h) reduced with orange peel extract for 30 minutes and 1 hour. GSH assay (i-j) reduced with orange peel extract for 30 minutes and 1 hour. GST assay (k-l) reduced with orange peel extract for 30 minutes and 1 hour. The data were considered significant ($p < 0.05$) and marked by the symbol “*”.