Supplementary Information

Designing Safer Nanohybrids: Stability and Ecotoxicological Assessment of Graphene Oxide-Gold nanoparticles Hybrids in Embryonic Zebrafish

Bashiru Ibrahim[a]*, Taiwo Hassan Akere [a], Pankti Dhumal[a], Eugenia Valsami-Jones[a], Swaroop Chakraborty[a]*

[a]School of Geography, Earth & Environmental Sciences, University of Birmingham, Edgbaston, UK

*Corresponding author: b.ibrahim@bham.ac.uk, s.chakraborty@bham.ac.uk
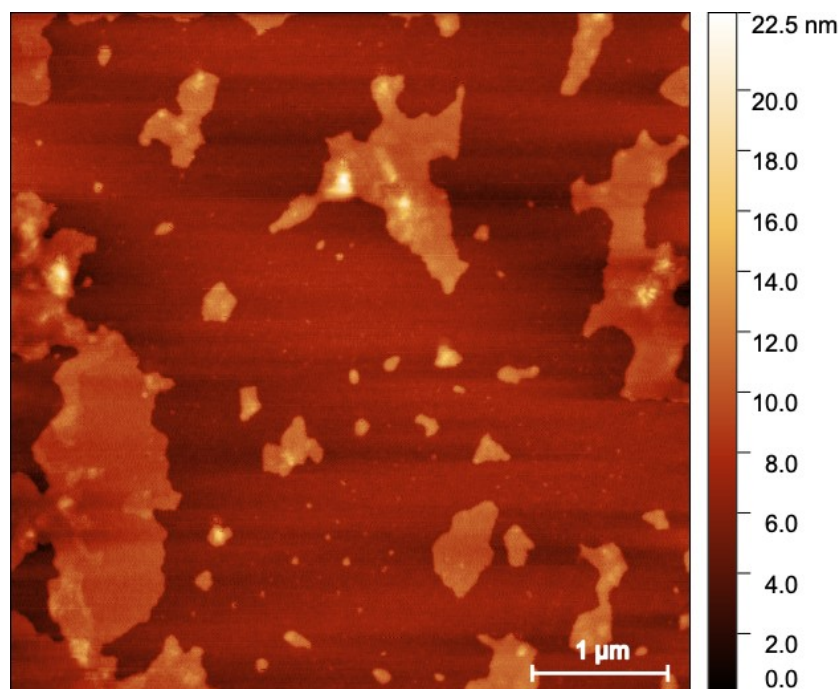

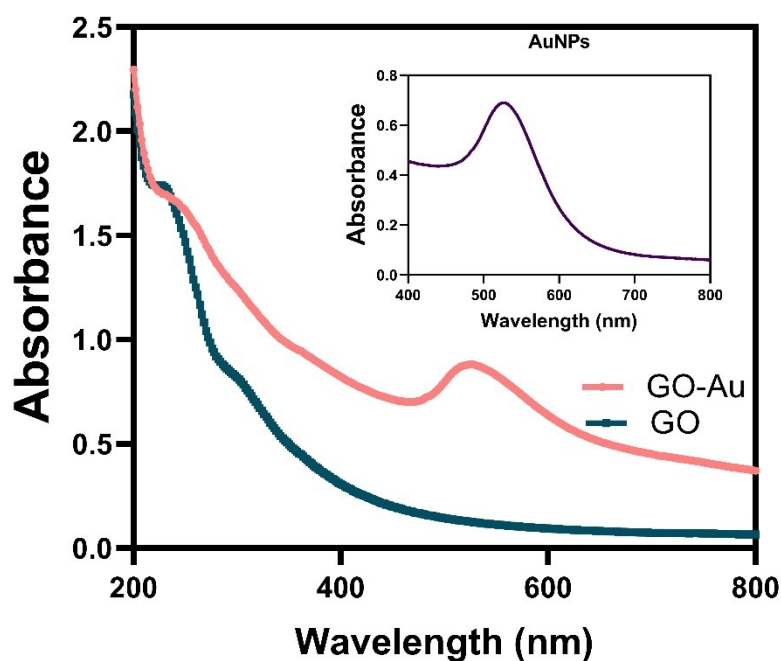***Figure S1**: Atomic force microscope topographic image of Graphene oxide*

Figure S2*: Absorbance spectra of AuNPs, GO and GO-Au dispersed in ultrapure water characterised using UV-Vis spectroscopy.*

Table S1: Analysis of elemental composition of GO

Name	Peak BE	FWHM eV	Area (P) CPS.eV	Atomic %	Q
O1s	533.18	2.95	461261.53	31.85	1
C1s	286.65	4.39	386685.75	68.15	1

Table S2: Analysis of elemental composition of GO-Au

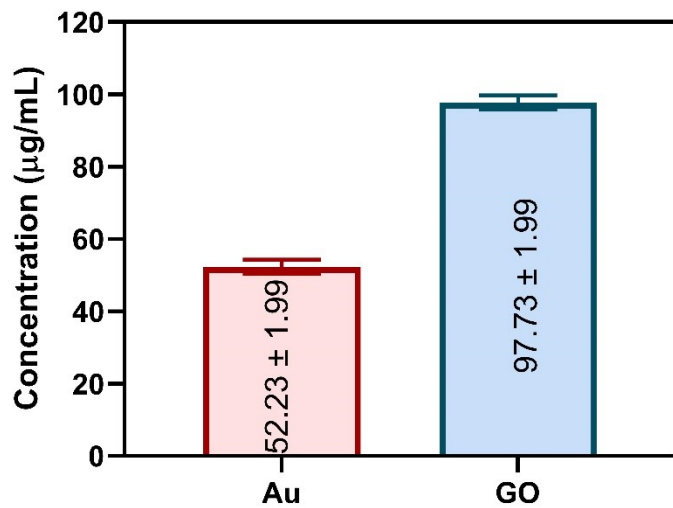| Name	Peak BE	FWHM eV	Area (P) CPS.eV	Atomic %	Q
O1s	533.18	3.1	1041814.74	29.83	1
C1s	286.68	4.5	918662.63	67.15	1
Au4f	85.09	3.06	776941.79	3.02	1

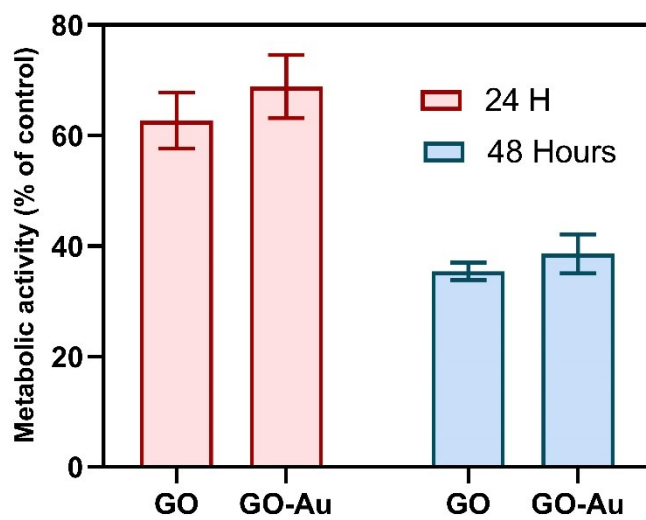**Figure S3: Elemental composition of Au in GO-AuNPs nanohybrids using ICP-MS**

Figure S4: Comparison of Metabolic activity between GO at 100 µg/ml and GO-Au at ~100 µg/ml of GO concentration.
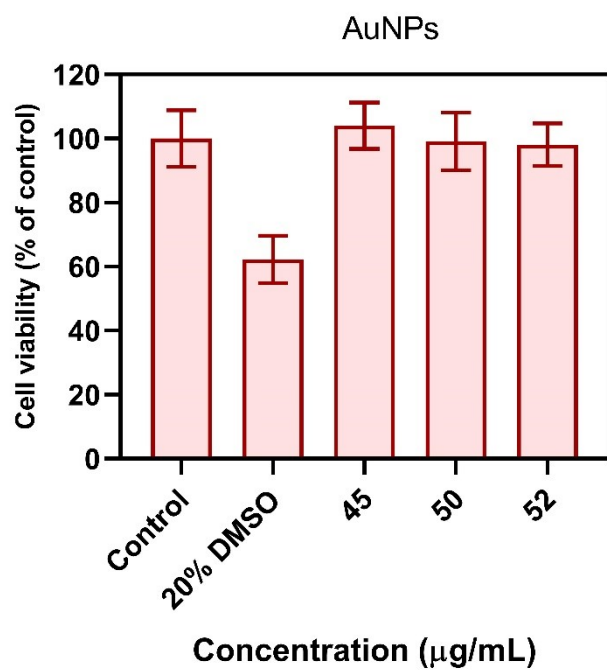
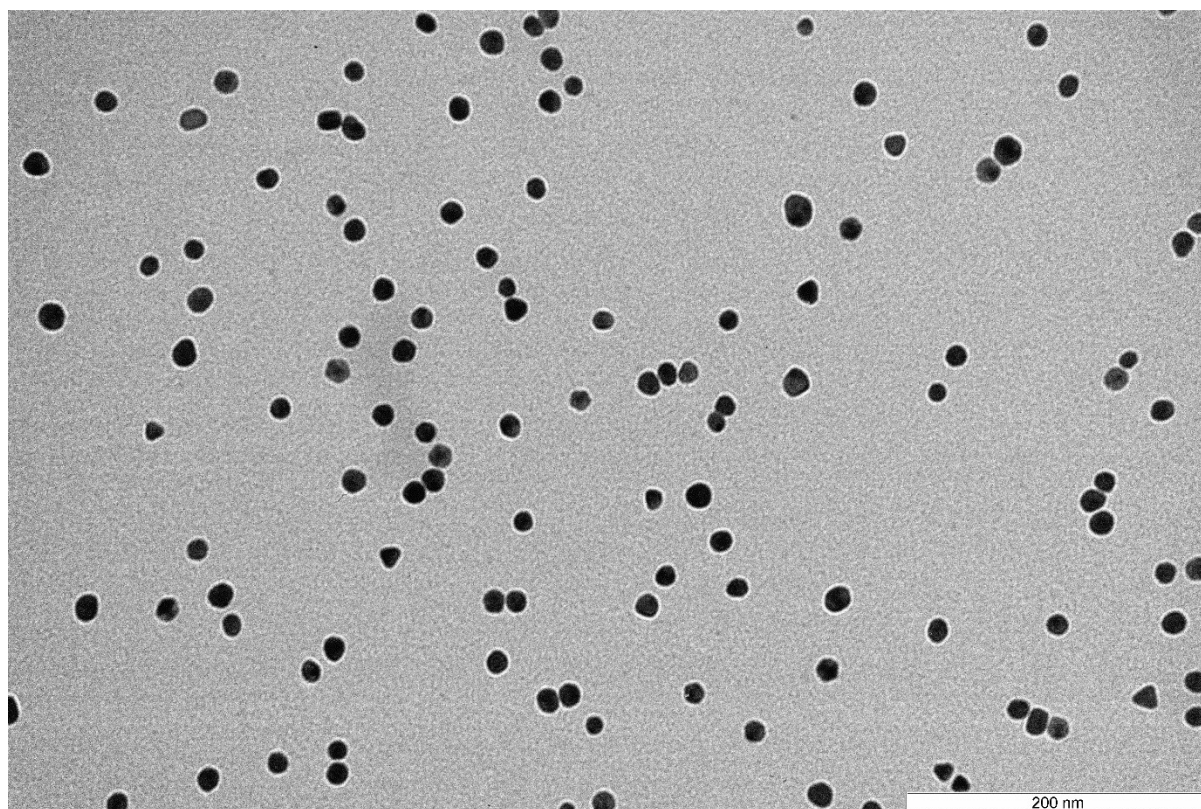*Figure S5: Cell viability of AuNPs at various concentrations*

Figure S6: Morphology and distribution of AuNPs