Supplementary material for:

"Rapid and simple approach for the characterization and quantification of gold nanoparticles in cell culture medium by single particle-ICP-MS"

Sergio Fernández-Trujillo¹, María Jiménez-Moreno¹, Ángel Ríos², Rosa del Carmen Rodríguez Martín-Doimeadios¹

¹Department of Analytical Chemistry and Food Technology, Faculty of Environmental Sciences and Biochemistry, University of Castilla-La Mancha, Avenida Carlos III s/n, 45071 Toledo, Spain.

²Department of Analytical Chemistry and Food Technology, Faculty of Chemical Sciences and Technologies, University of Castilla-La Mancha, Avenida Camilo José Cela s/n,

13071 Ciudad Real, Spain.

*Corresponding author:

Prof. Dr. Rosa Carmen Rodríguez Martín-Doimeadios

RosaCarmen.Rodriguez@uclm.es



Figure S1. SEM images of commercial suspensions of a 40 nm (A), 60 nm (B), and 80 nm (C) AuNPs.



Figure S2. Data processing for 60 nm AuNPs by SP-ICP-MS. (A) Time scan. (B) Signal distribution graph plotting the frequency of the data points as a function of the ICP-MS response. The discrimination between the particles (right side) and the background or ion (left side) is visually established by the minimum in the graph (arrow). (C) Particle size distribution.

Figure S3. Influence of different acquisition times for 60 nm AuNPs with a dwell time of 5 ms on particle mass concentration (ng L⁻¹) (A) and particle size (nm) (B). The dashed lines represent mass concentration (241±18 ng L⁻¹) (A) and size by SEM (61 ± 7 nm) (B).

Figure S4. Size distribution histograms of 40 nm (A), 60 nm (B), and 80 nm (C) AuNPs determined by SP-ICP-MS at optimal conditions. The black line represents the corresponding Poisson distribution curve fitting to the data.

Figure S5. Time resolved plots obtained during the analysis by SP-ICP-MS of ultrapure water (A) and a blank of DMEM (supplemented with 10 % FBS and antibiotics) (B).

Figure S6. Effect of incubation time on particle size distribution for a mixed solution of 40 nm, 60 nm, and 80 nm AuNPs with DMEM (supplemented with 10% FBS and antibiotics).

Dwell time	Number concentration
(ms)	(10 ⁶ particles L ⁻¹)
1	129±6
3	142±2
5	143±3
8	146±3
10	129±2

Table S1. Influence of different dwell times on the particle number concentration of 60 nmAuNPs at 144×10^6 particles L⁻¹ (n=3).

Table S2. Analytical performance of the SP-ICP-MS method.

Linear size range (nm)	40-80
Linear concentration range (R^2 > 0.99, ng L ⁻¹)	50-5000
LOD _{size} (nm)	22.4
LOD _{NP} (particles L ⁻¹)	2.1x10 ⁵
Precision particle size (n=10, %)	1
Precision number concentration (n=10, %)	< 1
Precision mass concentration (n=10, %)	< 1