## Supplementary material for:

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

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**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<sup>-1</sup>) (A) and particle size (nm) (B). The dashed lines represent mass concentration (241±18 ng L<sup>-1</sup>) (A) and size by SEM ( $61 \pm 7$  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 <sup>6</sup> particles L <sup>-1</sup> )
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  $144 \times 10^6$  particles L<sup>-1</sup> (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 <sup>-1</sup> )	50-5000
LOD <sub>size</sub> (nm)	22.4
LOD <sub>NP</sub> (particles L <sup>-1</sup> )	2.1x10 <sup>5</sup>
Precision particle size (n=10, %)	1
Precision number concentration (n=10, %)	< 1
Precision mass concentration (n=10, %)	< 1