

CASY<sup>VIVO</sup> Cell Counter & Analyzer - Powering Breakthroughs in Cell Research

## Standardizing Endothelial Cell Seeding for Nanoparticle Biocompatibility Assays

Haritz et al. (2025) Citrate-Coated Iron Oxide Nanoparticles Facilitate Endothelialization of Left Ventricular Assist Device Impeller for Improved Antithrombogenicity; Adv. Sci. 2025, 12, 2408976. DOI: 10.1002/adv.202408976

Cell Culture; Endothelial Cells; Nanoparticle; Biocompatibility	
Index	CC8
Standardization	X
Counting	X
Viability	X
Volume	

### The Challenge:

Accurately quantifying endothelial cell (EC) count and viability to ensure precise, standardized seeding density onto different nanoparticle-coated surfaces (Cit-IONP vs. PVP-IONP) for shear stress and biocompatibility analysis.

### CASY's Contribution:

CASY was used to accurately quantify ECs before IONP loading and seeding. This standardization ensured that all surfaces (Cit-IONP, PVP-IONP, controls) received an identical cell density, validating the finding that Cit-IONPs provided safer, more efficient cell loading and superior surface adhesion under shear stress

### Key Benefits to Researchers:

- Standardization:** Ensured precise and reproducible seeding density (e.g.,  $1.5 \times 10^6$  ECs) for all biocompatibility and functional assays.
- Accuracy:** Provided objective cell counts used for normalizing the WST-1 proliferation/viability assay, allowing for valid quantitative comparisons between the different nanoparticle coatings.
- Reliability:** Guaranteed that the observed differences in cell adhesion, viability, and antithrombogenicity were a true result of the nanoparticle coatings, not experimental artifacts from inconsistent cell numbers.

### Effect of IONP loading on proliferation and viability

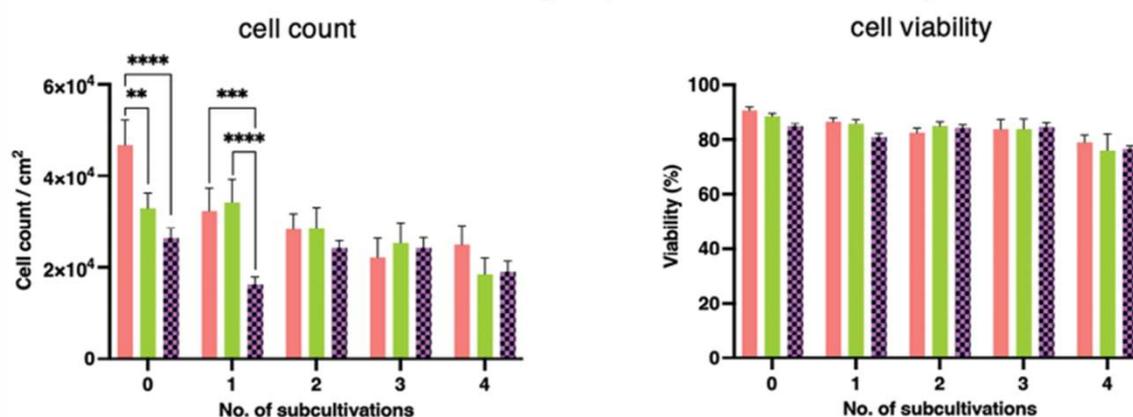


Figure 2. Assessment of residing IONPs during sequential subcultivation and the effect on proliferation and viability. ... (b) left: numbers of ECs gained via automated cell counting (CASY) from four consecutive passages after loading with Cit-IONPs (low dose, 24 h) or PVP-IONP (high dose, 24 h). right: fraction of viable ECs counted (CASY) at four consecutive passages after IONP loading. Data are shown as mean with standard deviation. Statistical comparison was carried out using one-way ANOVA with Bonferroni's multiple-planned comparison test (n = 3). Significant differences are indicated by \*\* for p < 0.01, \*\*\* for p < 0.001 and \*\*\*\* for p < 0.0001.