

CASY^{VIVO} Cell Counter & Analyzer - Powering Breakthroughs in Cell Research

Mechanical Strain Stimulates COPII-Dependent Secretory Trafficking

Phuyal, S. et al. (2022). Mechanical strain stimulates COPII-dependent secretory trafficking via Rac1; The EMBO Journal, 41(16), e110596. DOI: 10.15252/embj.2022110596.

HeLa cells; Sar1 knockdown	
Index	CC21
Standardization	X
Counting	
Viability	
Volume	X

The Challenge:

Understanding how mechanical signals, such as stretching or strain, regulate the early secretory pathway and ER exit site (ERES) formation.

CASY's Contribution:

The CASY cell counter was used to perform high-precision volumetric analysis of HeLa cells following the depletion of Sar1A/B. This allowed researchers to definitively prove that the observed inability of these cells to adapt to mechanical stress was a functional defect and not simply a consequence of altered cell size or diameter.

Key Benefits to Researchers:

- **Volumetric Precision:** Provided automated, high-resolution measurement of cell diameter to eliminate cell size as a confounding variable in mechanotransduction assays.
- **Standardized Normalization:** Enabled the normalization of cell counts to total populations, ensuring statistically robust comparisons between control and siRNA-treated groups.
- **Phenotypic Validation:** Verified that genetic manipulations (Sar1 knockdown) did not physically shrink the cells, confirming that the "failed spreading" phenotype was due to impaired secretory trafficking.

