

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

**Survival through Scaling: TXNIP-Mediated Amino Acid Control**

Kahlhofer et al. (2025). TXNIP mediates LAT1/SLC7A5 endocytosis to limit amino acid uptake in cells entering quiescence; The EMBO Journal, 44, 23. DOI: 10.1038/s44318-025-00123-x.

CRISPR; RPE1 cells;	
Index	CC13
Standardization	X
Counting	X
Viability	
Volume	X

**The Challenge:**

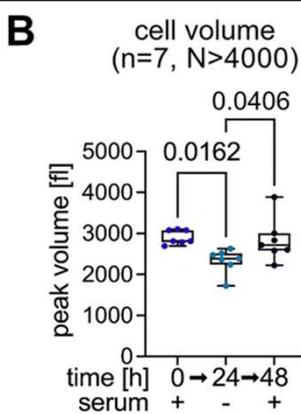
Recalibrating nutrient acquisition to match lower protein synthesis demands in quiescent cells to ensure metabolic homeostasis and survival.

**CASY's Contribution:**

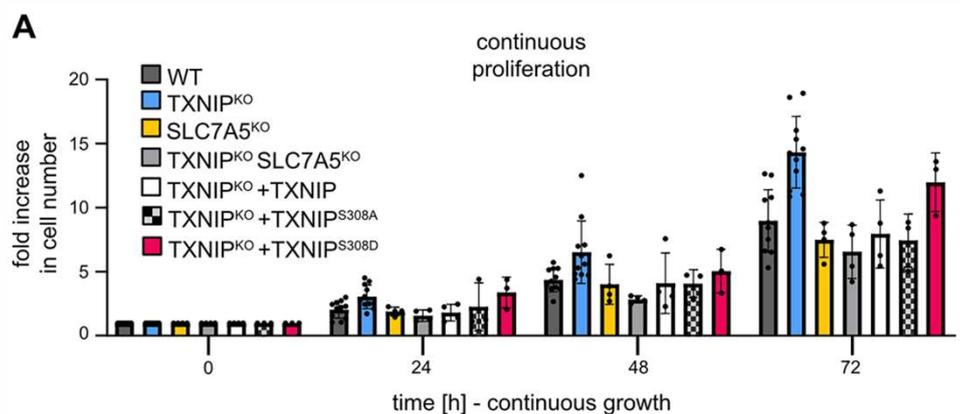
CASY measured precise cell volume reduction (femtoliters) and automated daily growth curves to track proliferation kinetics across multiple genetic backgrounds.

**Key Benefits to Researchers:**

- **Precision Volumetrics:** Quantified the definitive 20% reduction in cell volume (from 2907 fL to 2332 fL) that occurs as cells enter a quiescent state.
- **Automated Growth Monitoring:** Tracked cell numbers over 72–96 hours to demonstrate that TXNIP-deficient cells resume proliferation and reach G2/M phase faster than wild-type cells.
- **Standardized Fitness Analysis:** Provided the quantitative baseline necessary to normalize growth data for double knockouts and evaluate the metabolic rigidity of human TXNIP loss-of-function variants.



**Figure 1B: (Cell volume).** This graph illustrates the decrease in maximum cell volume during serum starvation, a physical marker of the resting phase, which is precisely measured with the CASY analyzer.



**Figure EV5A: (Continuous proliferation).** This chart utilizes automated CASY counts to track the fold increase in cell number over time, proving that loss of TXNIP leads to accelerated, SLC7A5-dependent growth.