

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

Quantify Glutamine-Dependent Proliferation and Survival in Myeloid Cells

Schoeppe et al. (2023). GS expression rescues human dendritic cell survival; *Frontiers in Oncology*, 13. DOI: 10.3389/fonc.2023.1123456.

Immunology; Cancer; DCs, THP-1, Macrophages	
Index	IM10
Standardization	
Counting	X
Viability	X
Volume	

The Challenge:

To quantify how glutamine deprivation, a key feature of the tumor microenvironment, affects the proliferation, viability, and differentiation of human myeloid cells (THP-1, DCs, Macrophages)

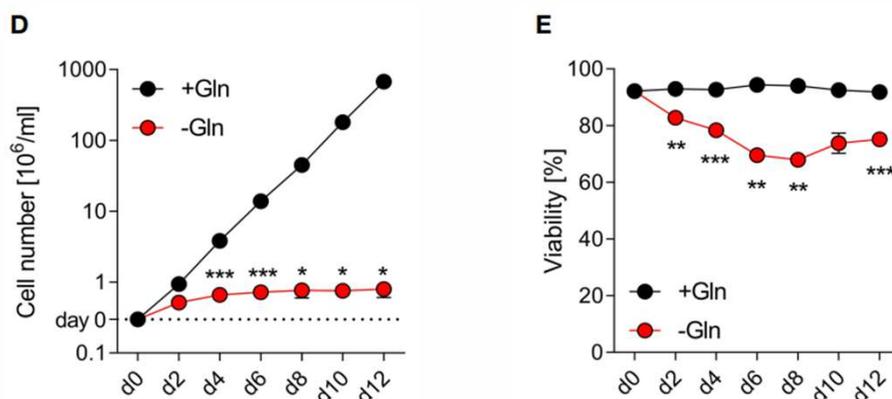
CASY's Contribution:

CASY monitored cell proliferation (cell number/yield) and viability for all myeloid cell types across all conditions. CASY data showed that glutamine deprivation stopped the proliferation of THP-1 cells but did not kill primary DCs or macrophages, which rely on Glutamine Synthetase (GS) for survival.

Key Benefits to Researchers:

- **Precision Accuracy:** Provided exact counts and viability for delicate primary MoDCs, which was essential for quantifying the survival-promoting effect of endogenous glutamine synthesis.
- **Label-Free Efficiency:** Enabled rapid, automated assessment of cell health without the need for metabolic dyes that could interfere with the study of nutrient-deprived cellular states.
- **Mechanism Validation:** Delivered the primary quantitative evidence used to validate that the persistence of dendritic cells in the absence of glutamine is directly dependent on GS activity.

CASY provided accurate information about proliferation of monocytic THP-1 depending on exogenous glutamine



- FIG 1: Proliferation of monocytic THP-1 depends on exogenous glutamine. THP-1 cells were cultured in the presence or absence of 2 mM glutamine (Gln). Cell yield (D) and viability (E) of THP-1 cells were analyzed every other day (mean ± SEM; n =3). Statistical significance was determined by two-way ANOVA and Bonferroni's multiple comparison test
- (*p < 0.05; ***p < 0.001).