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

High-Precision Growth Analysis of Pterin-Auxotrophic Trypanosomatids

Leishmania major; *Crithidia fasciculata*; *Trypanosome* brucei	
Index	BP1
Standardization	
Counting	X
Viability	X
Volume	

Ong, H. B. et al. (2015). Comparative metabolism of conjugated and unconjugated pterins in Crithidia, Leishmania and African trypanosomes. *PLoS Neglected Tropical Diseases*, 9(12), e0004245. DOI: 10.1371/journal.pntd.0004245.

The Challenge: Investigating why kinetoplastid parasites are pterin auxotrophs and determining the specific structural requirements of pterin analogues needed to support their growth and survival.

CASY's Contribution: CASY enabled precise daily monitoring of cell densities to determine half-maximal growth GC_{50} values for various pterins. *T. brucei* and *C. fasciculata* have nearly identical growth preferences.

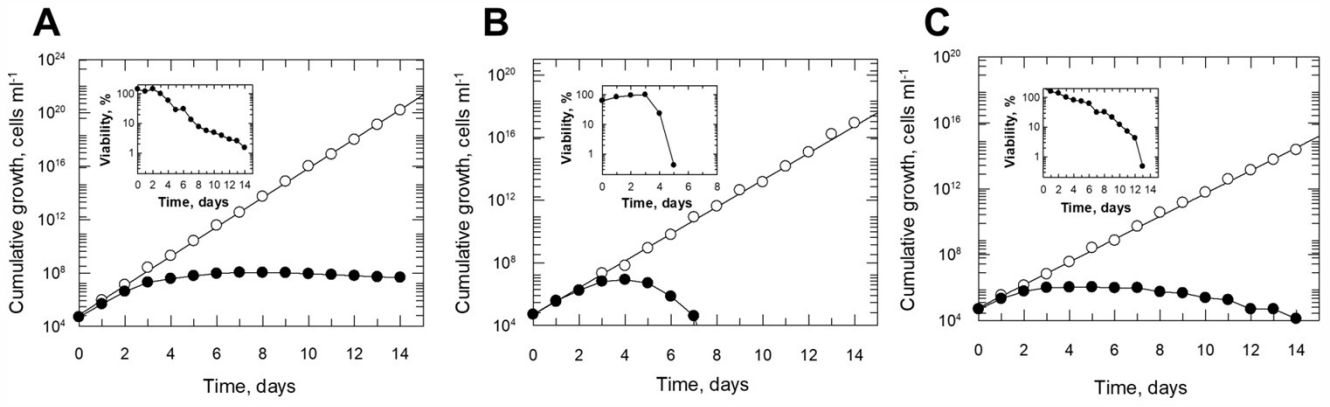
Key Benefits to Researchers:

Quantitative Precision: CASY provided the exact automated counts required to calculate precise half-maximal growth GC_{50} values for diverse pterin analogues.

Label-Free Efficiency: The system allowed for continuous, dye-free tracking of growth kinetics over 14-day periods, avoiding interference with delicate metabolic experiments.

Survival Validation: Automated monitoring definitively confirmed the timing of growth cessation and viability loss in the absence of essential pterin nutrients.

Figure 4 (Cumulative growth curves). This graph displays daily cell densities measured by the CASY system, illustrating the halt in growth and progressive loss of viability when parasites are deprived of biopterin.



CASY was **essential** for quantifying the nutritional requirements of these parasites. Its ability to provide precise, automated daily counts allowed researchers to definitively map the metabolic dependency of *T. brucei* on biopterin, validating pteridine reductase 1 as a key survival factor and a potential drug target.