

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

Targeting the Root of PDAC: Selective Eradication of Pancreatic Cancer Stem Cells

Cash et al. (2020). Induction of Lysosome Membrane Permeabilization as a Therapeutic Strategy to Target Pancreatic Cancer Stem Cells; *Cancers*, 12, 1790. DOI: 10.3390/cancers12071790

3D Sphere; pancreatic cancer stem cells	
Index	SC10
Standardization	X
Counting	
Viability	
Volume	X

The Challenge:

Pancreatic ductal adenocarcinoma (PDAC) remains highly lethal due to a sub-population of chemoresistant pancreatic cancer stem cells (PaCSCs) that drive tumor growth, metastasis, and relapse. Standard therapies like gemcitabine often fail because they target the bulk tumor while enriching for these resilient stem cells.

CASY's Contribution:

The CASY Cell Counter was instrumental in quantifying the self-renewal capacity of PaCSCs grown in 3D sphere cultures. By utilizing pulse area analysis, CASY provided automated measurements of sphere count, concentration, and volume. This enabled researchers to precisely track the depletion of the stem cell compartment following treatment with lysosomal membrane permeabilization (LMP) inducers.

Key Benefits to Researchers:

- **Automated 3D Quantification:** CASY allowed for the high-precision counting of spheres larger than 40µm, removing the subjectivity and labor-intensity of manual microscopy.
- **Multi-Parametric Sizing:** The system provided detailed size distributions (40–80µm, 80–120µm, and >120µm), which was essential for characterizing the inhibitory effects of compounds on sphere growth.
- **Standardized Self-Renewal Metrics:** Provided the objective physical baseline needed to confirm that Series 1 compounds—but not gemcitabine—effectively ablate the sphere-forming capacity of patient-derived PDAC cells.

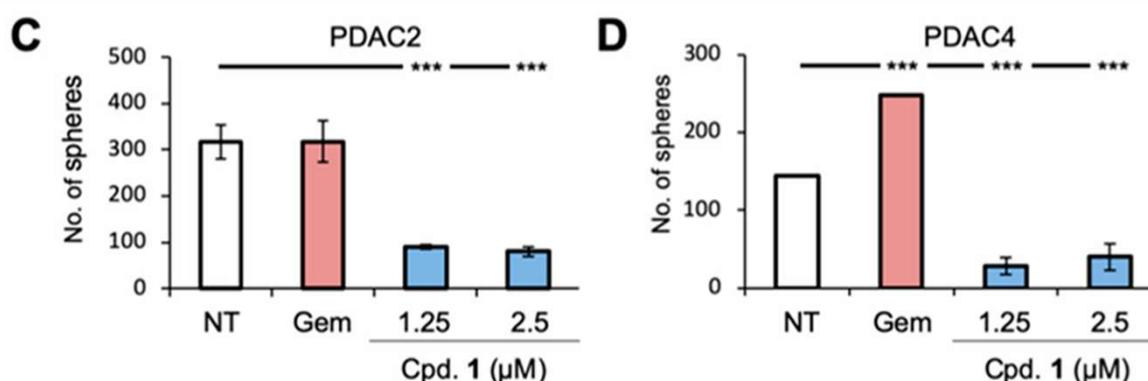


Figure 3C and 3D: (Number of spheres/mL). These bar graphs represent the core functional data for the study's in vitro validation. CASY was used to generate these counts, demonstrating that while gemcitabine often increased sphere formation, the novel LMP-inducing compounds significantly reduced the number of viable CSC-enriched spheres across multiple patient-derived models.