

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

## Epigenetic Regulation of NR5A2: Disrupting Stemness in Colorectal Cancer

Liu et al. (2025). Epigenetic regulation of NR5A2 influences colorectal cancer cell stemness; Cell Communication and Signaling, 23:484. DOI: 10.1186/s12964-025-00484-z.

CRC; Colorectal cancer; Spheres	
Index	CC15
Standardization	X
Counting	X
Viability	
Volume	X

### The Challenge:

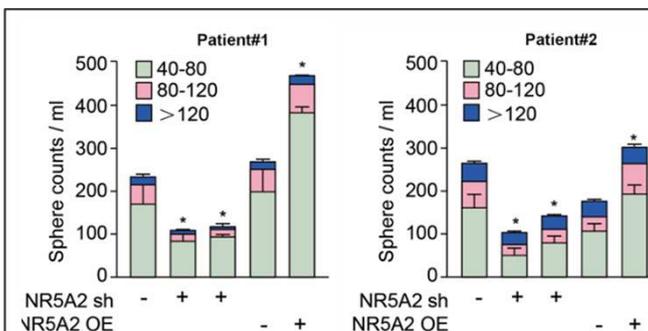
Colorectal cancer (CRC) is an aggressive malignancy where a subpopulation of cells known as cancer stem cells (CSCs) drive tumor initiation, metastasis, and resistance to therapy. Identifying and targeting the upstream epigenetic regulators of these stem cells is critical for preventing relapse and improving durable remission in patients.

### CASY's Contribution

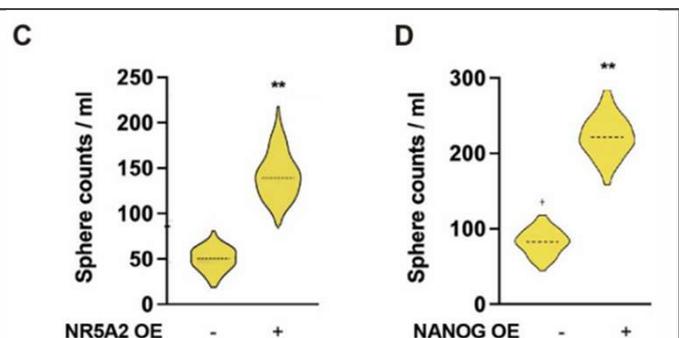
The CASY cell counter was utilized to perform high-precision, automated quantification of primary and secondary spheres in CSC-enriching cultures. By accurately determining sphere numbers and sizes, the system allowed researchers to objectively evaluate the impact of pharmacological inhibition (via Cmp3) and genetic modifications (knockdown and overexpression) on CSC self-renewal capacity.

### Key Benefits to Researchers:

- **Automated 3D Quantification:** CASY provided rapid and objective counts of primary and secondary spheres, eliminating the subjectivity of manual microscopy.
- **Self-Renewal Characterization:** The system enabled the precise tracking of secondary sphere-forming capacity, which is a gold-standard metric for assessing the functional persistence of the CSC pool.
- **Volumetric Standardization:** CASY helped characterize the dose-dependent reduction in both the number and physical size of spheres following treatment with the NR5A2 inhibitor Cmp3.
- **Kinetic Accuracy:** Enabled the robust analysis of 7-day culture cycles across multiple patient-derived lines, ensuring high statistical confidence in the anti-stemness effects of NR5A2 modulation.



**Figure 2 (F): (Secondary sphere-forming capacity).** This graph illustrates the significant decrease in sphere counts following NR5A2 knockdown and the increase following overexpression, with all counts standardized via CASY



**Figure 4 (C and D): (Sphere formation capacity).** These violin plots use CASY-generated sphere counts per milliliter to demonstrate that NR5A2 and its downstream target NANOG directly promote stemness in sorted CD133<sup>+</sup> CRC cells