

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

Hydrostable Magnesium Phosphate Bone Adhesives

Renner et al. (2025). Hydrostable hard tissue adhesives based on organophosphates and magnesium phosphates... **Scientific Reports**, 15:29902. DOI: 10.1038/s41598-025-82001-w.

MG-63 osteoblastic cells	
Index	CC23
Standardization	X
Counting	X
Viability	
Volume	

The Challenge:

Developing bone adhesives that maintain high adhesive strength while remaining stable in a watery (hydrolytic) environment—a critical requirement for both surgical application and reliable long-term biological testing.

CASY's Contribution:

The CASY cell counter was utilized to perform high-precision automated quantification of MG-63 osteoblastic cells. It was used both to standardize the initial seeding density (exactly 50,000 cells/well) and to measure absolute cell numbers on the adhesive specimens at various time points (days 2, 4, 7, and 9).

Key Benefits to Researchers:

- **Precision Standardization:** Enabled exact cell dose adjustment (100 µl of suspension in 10 ml electrolyte) to ensure uniform starting conditions across six different adhesive formulations.
- **Multi-Modal Validation:** Provided automated, label-free cell counts that were cross-validated with DNA (PicoGreen) and metabolic (WST-1) assays to distinguish between changes in cell health and changes in actual cell population size.
- **Methodological Rigor:** Delivered the objective, reproducible metrics needed to confirm that the OPLS/MgP formulation actively promoted cell proliferation rather than just stimulating individual cell metabolism.

This graph plots the absolute MG-63 cell numbers over 9 days as measured by the CASY system. The data demonstrates that OPLS-containing magnesium phosphate cements (compositions 3 and 4) support significantly higher cell proliferation compared to reference materials.

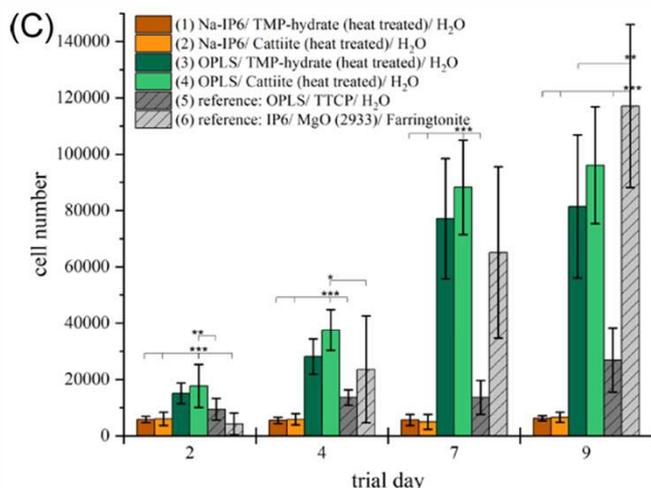


Fig. 6. After culturing MG-63 on adhesive cement test specimens (n = 4 each) for 9 days in two independent preparations, measurements were carried out to quantify cell activity and proliferation. ... **(C)** Cell number per test specimen.