

AIR-FREE SUPERCOOLING TECHNIQUE FOR THE EXTENDED PRESERVATION OF IN VITRO LIVING SYSTEMS

Tech ID: 34226 / UC Case 2026-015-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

While organoids offer unparalleled advantages over traditional models for disease modeling and drug screening, their clinical translation is hindered by the difficulty of preserving their complex structures and functions. UC Berkeley researchers have addressed this by developing an air-free supercooling platform that maintains these systems in a liquid state at sub-zero temperatures without ice nucleation. By utilizing an engineered sealing system, this technology enables the extended preservation of complex 3D models at hypothermic temperatures without toxic cryoprotectants. This approach ensures high cell viability and functional integrity upon recovery, even protecting samples from vibration or accidental impact during transport.

SUGGESTED USES

- » Extended short-term storage and transport of organ-on-a-chip devices and complex 3D organoids.
- » Preservation of primary cell cultures and sensitive cell lines without traditional cryopreservation.
- » Cold chain management for cell-based therapies and regenerative medicine products.
- » High-throughput screening workflows requiring controlled pauses in biological activity.
- » Stabilization of biological samples for international shipping and multi-site research collaborations.

ADVANTAGES

- » Prevents damaging ice crystal formation even at temperatures significantly below the freezing point.
- » Eliminates the need for toxic chemical additives.
- » Maintains a stable supercooled state during handling and shipping.
- » Compatible with standard laboratory vessels.
- » Significantly extends the window of metabolic stasis compared to traditional 4°C storage.

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OTHER INFORMATION

CATEGORIZED AS

- » **Biotechnology**
- » Health
- » Other
- » **Research Tools**
- » Cell Lines
- » Other

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