

## Module to Freeze and Store Frozen Tissue

### Summary (1024-character limit)

Researchers at the National Cancer Institute (NCI) have developed an engineered storage unit for frozen tissue, that provides a permanent base on which to mount tissue frozen in OCT and an enclosure for storage. The unit provides for chain-of-custody labeling and acts as an insulating container to protect the specimen. Other elements include devices for freezing the tissue to the base, as well as a holder for the base to facilitate cryosectioning. Application of the storage system allows a frozen tissue specimen to be moved between storage and cryosectioning without loss of label, deformation of tissue, or thermal alterations.

### NIH Reference Number

E-173-2015

### Product Type

- Devices

### Keywords

- Pathology
- Diagnostic
- Freezing
- Biopsy
- Storage
- Frozen Tissue
- Biorepository
- Cryosectioning

### Collaboration Opportunity

This invention is available for licensing and co-development.

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### Description of Technology

Tissue obtained for both clinical and research purposes is routinely frozen, commonly in Optimal Cutting

Temperature (OCT), an embedding media, for eventual downstream analysis, commonly including sectioning on a cryostat. Though OCT is the standard compound used for freezing, there is no standard freezing protocol. Thus, current methods of handling, labeling, and storing OCT-embedded tissue vary widely, and specimens are often damaged or degraded due to undesirable temperature fluctuations during handling and freezing.

To address these issues, researchers from the NCI [Laboratory of Pathology \(LP\)](#) have engineered a system that employs a plastic enclosure that also functions as a tissue platen for cryosectioning, which is then enclosed with a lid for storage. This plastic enclosure also has an integrated space for labeling (written, barcode, RFID, etc.). The lid snaps closed to protect the specimen from deformation and/or thermal shock. This 'freezing system' is particularly unique since it is modular (i.e. designed to fit in commonly used research/clinical storage units) and affordable. Additionally, the module can be designed to work with any manufacturer's tissue holders for cryosectioning.

### Potential Commercial Applications

- This is a novel enclosure that provides a standardized method of freezing, labeling, and storing fresh tissue samples for diagnostic and/or research purposes
- This 'freezing system' would be particularly useful for rare or fragile specimens, since it can significantly reduce the possibility of deformation or thermal shock
- Tissue is frozen as a sandwich directly onto plastic enclosure, using an OCT and a pre-existing mold

### Competitive Advantages

- This is a novel device that addresses an unmet need in frozen tissue storage and evaluation
- Enclosure has integrated external labeling, for minimal disturbance of sample
- Enclosure has a snap-closed lid for added sample protection
- Enclosure is plastic-insulative properties (i.e. slow to adjust to changes in external temperature)
- Enclosure is modular and versatile; it will fit in most commonly used storage units in research and clinical settings
- Enclosure is affordable; each unit is designed for single use
- A model is available for clinical application, in which a frozen specimen can be subject to cryosectioning and then directly enclosed into an open unit for immediate fixation and processing as formalin fixed, paraffin embedded tissue, for confirmation of diagnosis

### Inventor(s)

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### Development Stage

- Discovery (Lead Identification)

### Patent Status

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/403,585, Filed 03 Oct 2016

NCI Technology Transfer Center

<https://techtransfer.cancer.gov/pdf/e-173-2015.pdf>

### Related Technologies

- E-052-2013 - Argon to Improve Bioanalyte Stability in Fixed Tissue Specimens
- E-139-2015 - Novel Fixative for Improved Biomolecule Quality from Paraffin-Embedded Tissue

### Therapeutic Area

- Cancer/Neoplasm
- Infectious Diseases
- Immune System and Inflammation
- Eye and Ear, Nose & Throat
- Hormonal Systems, Endocrine, and Metabolic Diseases
- Cardiovascular Systems
- Gastrointestinal
- Kidney and the Genitourinary
- Musculoskeletal
- Reproductive
- Skin and Subcutaneous Tissue