



# Protocol 1006: Snap Freezing Samples in Dry Ice Using a Thermoconductive Tube Rack Module

## Introduction

There are a variety of Thermoconductive Tube Rack modules to fit many commonly used sample vessels including the Thermoconductive Tube Rack series, M-PF series, and the CF series. This document shows a Thermoconductive Tube Rack and an Ice-Free Cooling Workstation as an illustrative example of how to snap freeze in an efficient and reproducible manner. The Thermoconductive Tube Rack module allows you to snap freeze samples with dry ice alone. No alcohol is required.

## Materials

- Thermoconductive Tube Rack module
- Ice-Free Cooling Workstations or insulative ice pan
- Dry ice

## Snap-Freezing with a Thermoconductive Tube Rack Module

Use either a Cooling Workstation for use with Smaller Thermoconductive Tube Rack or an insulative ice pan to contain the dry ice. No alcohol is required in this method.

1. Place the Thermoconductive Tube Rack module directly on crushed or cake dry ice. A buzzing sound coming from the metal-ice contact is normal and safe.
2. The Thermoconductive Tube Rack module will cool to dry ice temperature in approximately 5-7 minutes ( $-78^{\circ}\text{C}$ ).
3. Place a sample tube in Thermoconductive Tube Rack module at any time after it reaches temperature.

4. The sample will snap freeze in 1-3 minutes and may be left in place while the remaining samples are being processed.
5. All samples will remain at  $-78^{\circ}\text{C}$  while the Thermoconductive Tube Rack is in direct contact with dry ice.
6. Remove samples for freezer archive. The Thermoconductive Tube Rack module with snap-frozen samples in place may also be placed directly into a storage freezer.

## Using an Ice-Free Cooling Workstation base

Using a Cooling Workstation for use with Smaller Thermoconductive Tube Rack requires a minimal amount of dry ice and is an efficient way to snap freeze samples.

1. Fill a Cooling Workstation with 200 cc of crushed dry ice. Place the rack module directly on the dry ice and allow approximately 5-7 minutes to cool to dry ice temperature. (Figure 1)
2. Place a sample in the Thermoconductive Tube Rack module. (Figure 2)



Figure 1



Figure 2



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- The sample will snap freeze in 1 to 3 minutes and may be left in place as long as dry ice remains in contact with Thermoconductive Tube Rack module. One charge of dry ice in a workstation can last up to 10 hours with the lid closed. (Figure 3)
- All samples may be transferred to a storage freezer when the procedure is complete. Use protective gloves if handling a frozen Thermoconductive Tube Rack module to avoid skin-freezing burns. (Figure 4)



Figure 3



Figure 4

## Using an Insulated Ice Pan

- Fill an insulated pan with 1 to 2 inches of cake or crushed dry ice. Place the Thermoconductive Tube Rack module directly on the dry ice and allow 7 minutes to reach dry ice temperature. (Figure 1)
- Place a sample in the Thermoconductive Tube Rack module. (Figure 2)
- The sample will snap freeze in 1 to 3 minutes and may be left in place as long as dry ice remains in contact with Thermoconductive Tube Rack module. (Figure 3)
- All samples may be transferred to a storage freezer when the procedure is complete. Use protective gloves if handling a frozen Thermoconductive Tube Rack module to avoid skin-freezing burns. (Figure 4)



Figure 1

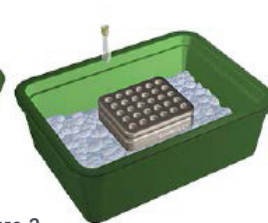


Figure 2



Figure 3



Figure 4

*Note: It is important to adhere to laboratory safety protocols when handling dry ice or liquid nitrogen. Thermoconductive Tube Rack and Thermoconductive Tray modules can cause skin burns when cooled to ultra-low temperatures. Use extreme caution and appropriate protective clothing and equipment.*