

## Using the MicroRT™ System for Room- and Low-Temperature Crystallography

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The MicroRT™ system replaces conventional glass capillaries and makes collecting data at room temperature as easy as at low temperatures. By allowing rapid room temperature screening and early weeding out of poorly diffracting crystals, MicroRT™ can increase your overall diffraction throughput by a factor of five or more.

- To prepare a sample, start by injecting your environment-stabilizing solution into the polyester tube using gel loading pipette tips. Try to **inject the solution all the way down to the sealed end**, so there's no gas bubble between the end and the liquid plug. This will help the liquid plug to stay put even if the sample is roughly handled, and eliminate plug motion caused by temperature changes.
- **Be generous with your plug size** (say 10-40  $\mu$ l), especially if you want the crystal to remain fully hydrated for several hours. There is some evaporation (roughly 80 nl/hour) through the very thin polyester wall.
- Mount your crystal on a MicroMount™ or MicroMesh™ that's been inserted into a goniometer base. Remove excess liquid, but don't let the crystal dry out entirely or it may fall off the mount.
- Slide the capillary tubing past your crystal and onto your goniometer base using the **MicroRT™ Aligner**. Alternatively, work under a magnifier or microscope, **draw the polyester tubing down over the crystal and mount and onto the goniometer base**, being careful not to bump the crystal. To make a better seal (required only if the crystal will sit for several hours), apply a tiny amount of grease (e.g., Dow-Corning #976V high vacuum grease) or oil to the tube-capturing tip of the goniometer base.
- Align the crystal manually or using an auto-alignment system, just as you would for a MicroMount™ without the tube. **Alignment is much easier than for crystals in glass capillaries** since the crystal doesn't contact the tubing wall and there's no optical distortion.
- After you've collected a desired number of frames, slide the polyester tubing off. You can then soak the crystal in any desired solution or replace the liquid plug with another solution (e.g., to vapor diffuse in a small molecule or to dehydrate the crystal), and then draw the tubing back over the crystal and take more frames.
- Once you've collected your room temperature frames, just pop off the tubing, plunge the MicroMount™ in your favorite liquid cryogen, and you're ready to collect low-temperature data.

If you want store your crystals for longer than 12 - 24 hours, replace the polyester tube with any 2 mm ID glass or thick-walled plastic tubing.

**Our goniometer bases are compatible with all standard hardware including plastic caps and CryoVials.** The MicroRT™ system can also be used with conventional nylon loop mounts. However, since the loops can have random positions and orientations relative to the pin and tube axis, there's a greater chance of bumping the loop and crystal when the tubing is slid in place.

The **MicroRT™ system** is also employed in our **Crystal Dehydration and Salvage Kit** designed to improve the diffraction properties of your crystals.

Please contact [xtals@jenabioscience.com](mailto:xtals@jenabioscience.com) with comments or suggestions.