



Cryo-EM Merit Badge Independence Checklist

A Collaboration Among the NIH-Funded Cryo-EM National Centers

AutoLoader Loading Independence Test Checklist – CryoEM Merit Badges

Trainee: _____

LN2 handling

- ☐ ☐ Proper PPE is worn (gloves, goggles, face mask).
- ☐ ☐ Minimize spills when pouring.

Preparing tools

- ☐ ☐ Get NanoCab and lid.
- ☐ ☐ Prepare transfer station with accessories: Station, metal block, cassette gripper, top covers, side cover, autogrid tweezers, cassette tweezers, large forceps, autogridbox opening tool, dewars, grid boxes.
- ☐ ☐ Always wear gloves whenever touching the cassette.
- ☐ ☐ Use the correct cassette for the microscope being loaded.
- ☐ ☐ Assemble loading station, side window covered.
- ☐ ☐ Cool down loading station (with cassette in station if not retrieving one from a microscope).
- ☐ ☐ Cool down NanoCab - keep lid on as much as possible.

Docking and undocking NanoCab with the Autoloader

- ☐ ☐ Verify the microscope is idle, column valves are closed, apertures are out, & the microscope is cryogenic.
- ☐ ☐ Verify there is a LN₂ tank connected to the microscope.
- ☐ ☐ With the cryogen label facing you, remove the cover from the NanoCab, test that you can lift the cassette lock pin, then slide it onto the Autoloader dock.
- ☐ ☐ Dock the NanoCab, using the green Dock button, touch screen, or PC interface.
- ☐ ☐ When prompted, remove NanoCab from the dock. Visually verify the cassette was removed and replace the cover.

Attach Nanocab to loading station and position cassette for loading

- ☐ ☐ Take side cover off of transfer station and dock NanoCab, securing with the red clamp.
- ☐ ☐ If retrieving a cassette from the NanoCab, remove transfer station covers and use the cassette gripper to remove the cassette from the NanoCab and place into the metal block.
- ☐ ☐ Seat the cassette gripper back in its home position and replace covers.

Adding autogrids into the cassette and putting cassette into NanoCab

- ☐ ☐ Place grid boxes in the metal block, securing with lids in the appropriate screw holes.
- ☐ ☐ Cool autogrid tweezers.
- ☐ ☐ If removing grids from a full cassette, use the autogrid tweezers to pick up grids from the cassette and transfer into empty autogrid boxes.
- ☐ ☐ To put new grids in: use the autogrid tweezers to remove the autogrid from grid box, check that C-clip is secure and in the correct orientation (C-clip faces side of the station where NanoCab attaches), and place into cassette slot secured with the spring.
- ☐ ☐ Check that each grid is secured properly using the autogrid tweezer.
- ☐ ☐ Confirm there is an empty slot if there is a grid on the microscope stage.



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Transfer cassette into NanoCab

- ☐ ☐ Use the cassette gripper to pick up the cassette and transfer into the NanoCab.
- ☐ ☐ Return the cassette gripper to its home position.
- ☐ ☐ Put the covers back on the transfer station.
- ☐ ☐ Take the NanoCab off the transfer station and replace transfer station side cover. Top off with LN₂.
- ☐ ☐ Check the cassette lock by pulling on the metal cassette lock pin.
- ☐ ☐ Put cover on NanoCab and take it to the microscope.

Cleaning Up

- ☐ ☐ Empty LN₂ from NanoCab and place in incubator to dry.
- ☐ ☐ Disassemble the loading station and leave to dry.
- ☐ ☐ Place empty grid boxes in appropriate place.
- ☐ ☐ Return all tools to proper place and leave bench clean.

Supervising Staff 1: _____

Date: _____

Supervising Staff 2: _____

Date: _____