

Standard Operating Procedure (SOP) for Dragonfly

1. PURPOSE:

This SOP outlines the correct usage, maintenance, and shutdown procedures for the Dragonfly dispensing system from SPTLabtech to ensure safe and consistent operation.

2. SCOPE:

This SOP applies to all authorized personnel operating the Dragonfly system within the laboratory.

3. RESPONSIBILITIES:

- Only trained personnel are permitted to operate the Dragonfly system.
- Operators must adhere strictly to this SOP.
- Maintenance and troubleshooting issues should be reported to the designated laboratory manager.

4. EQUIPMENT AND MATERIALS NEEDED:

- Dragonfly system (SPTLabtech)
- Computer with Dragonfly software installed
- Microplates (as per experimental requirements)
- Reagents and samples
- Personal Protective Equipment (PPE): Lab coat, gloves, and safety glasses

5. SAFETY PRECAUTIONS:

- Always wear appropriate personal protective equipment (PPE).
- Ensure the workspace around the Dragonfly system is clean and free of obstructions.
- Handle reagents and samples in accordance with their respective Safety Data Sheets (SDS).

6. STARTUP PROCEDURE:

6.1. Power on the System

- Inspect the Dragonfly system to ensure it is clean and free of debris.
- Turn on the main power switch on the Dragonfly unit.
- Power on the computer connected to the Dragonfly.

7. OPERATION PROCEDURE:

7.1. Set Up the Protocol

- Start the Dragonfly Designer software.
- In the design tab, open an existing protocol or create a new one.

7.2. Configure dispensing parameters, including:

- Plate type and layout
- Reagent volumes, concentrations, and pH
- Dispensing patterns and sequences
- In the Export tab, click "Calculate Optimization."
- Save the protocol in your designated folder and export it as a .csv file.
- Close the Dragonfly Designer software.

7.3. Load the Protocol

- Start the Dragonfly software.
- Open the previously created .csv file.
- In the gradient tab, adjust the parameters, including:
- Plate type and layout
- Reservoir volume
- Whether to use a mask (for viscous solutions)

7.4. Load Reagents and Samples

- Navigate to the Setup tab.
- Assemble the syringes and pistons and gently clip them into the required positions on the Dragonfly (a small green square should appear next to the syringe name in the software).
- Gently remove the metal reservoir frame and place the plastic trays in the appropriate positions.
- Fill the plastic trays with the required amount of reagent (add ~10% extra volume to avoid bubbles).
- Slide the reservoir tray into the park position.
- Click "Aspirate" to allow the robot to aspirate the solutions into the syringes.
- Check for bubbles in the syringes; if present, click "Purge" and repeat the aspiration process.

7.5. Load Microplates

- Prepare the microplates, ensuring they are clean and appropriately labeled.
- Place the microplates on the deck.

7.6. Run the Dispensing Protocol

- Review the protocol parameters and microplate positions.
- Click "Run" to start the dispensing process.
- Monitor the system during operation to ensure proper dispensing and address any software alerts or hardware issues immediately.

7.7. Mix the Plate

- Start the MX One Mixer software.
- Place the appropriate frame on the deck (e.g., MRC-2 well, Swiss plate 3 well).
- Attach the 96-well pin array to the Mixer.
- Place the microplate on the deck.
- Select the appropriate plate type in the software and run the 2-minute mixing protocol.
- Remove the plate after mixing is complete.

8. POST-OPERATION PROCEDURE:

8.1. Clean the Dragonfly System

- Click "Purge" in the Dragonfly software.
- Remove and disassemble the syringes, trays, and Mixer pin array, placing them in the large black plastic tray.
- Wash all components with water at the sink.
- Leave the components to air dry.

8.2. Clean the Exterior

- Wipe down the exterior surfaces of the Dragonfly system with a clean, lint-free cloth.

8.3. Save Data

- Save the dispensing data from the session to the appropriate location on the computer or network.
- Log any observations or issues encountered during the run in the lab notebook or digital log

9. SHUTDOWN PROCEDURE:

- Close the Dragonfly software and shut down the computer.
- Turn off the main power switch on the Dragonfly unit

10. MAINTENANCE:

- Weekly: Inspect the dispensing head and cassettes for wear and tear. Clean or replace as necessary.
- Monthly: Perform a full calibration of the system to ensure accurate dispensing.
- Annually: Schedule professional servicing from SPTLabtech or an authorized technician.

11. TROUBLESHOOTING:

- If the system displays an error, refer to the troubleshooting guide in the Dragonfly user manual.
- Contact the SBL platform officer for assistance.
- For persistent issues, contact SPTLabtech customer support

12. RECORD KEEPING:

- Maintain a log of each operation, including the operator's name, date, protocol used, and any issues encountered.
- Record calibration and maintenance activities in the maintenance log.

13. REFERENCES:

- Dragonfly User Manual (SPTLabtech)
- Laboratory Safety Guidelines