

# **Medicinal Genomics MaGiC Lysis Automation on BMS Myra Liquid Handler**

## **User Guide**

This user guide provides instructions for using the Bio Molecular Systems Myra Liquid Handler to perform MaGiC Lysis.

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## Overview

Medicinal Genomics has partnered with Bio Molecular Systems (BMS) to streamline and enhance qPCR and RT-qPCR testing workflows. The integration of the Myra Liquid Handling Platform with the Mic qPCR Instrument enables users to automate multiple key processes, including MaGiC™ Lysis, qPCR master mix preparation, positive control dilutions, qPCR setup, and data analysis—resulting in a faster, more consistent, and highly efficient workflow.



Image 1: BMS Myra Liquid Handler and MIC qPCR Instruments

## Biological Safety

Handle biological material with care and in accordance with the required safety regulations. Always wear safety glasses, gloves, and a lab coat. The user must take the necessary precautions to ensure that the surrounding workplace is safe and that the instrument operators are suitably trained and not exposed to hazardous levels of infectious agents.

## Decontamination of Instrument

Surfaces of the Myra instrument, including the deck and pipette head, can be decontaminated using a solution of sodium hypochlorite (NaOCl). A solution containing 1 g/L available chlorine will be suitable for sanitation in a general lab environment; stronger solutions (5 g/L) are recommended when dealing

with high risk situations. A Hepa Filter and UV light are also available for decontamination (see UV Light in the Workbench User Manual).

### Software Installation

- Install the Myra Software, located on the provided USB Flash drive, onto a PC. Ensure that the PC meets the following minimum requirements:
  - Windows® 10, 64-bit (English version) Operating System
  - .NET Framework 4.5 or higher
  - Intel i5 processor, 2.4 GHz
  - 8 GB of RAM
  - 1 GB free hard drive capacity
  - Pointer device
  - USB Drive
  - Adobe® Reader® must be installed to be able to view reports in PDF format.
- The latest version of the BMS Workbench Software can be found on the BMS website: <https://biomolecularsystems.com/media-downloads/myra-downloads/>
  - Registered users will be notified via email upon release of a new software version. To register go to <https://biomolecularsystems.com/customer-registration/>
- Follow the instructions that appear in the Setup Wizard.
  - If the computer is connected to a network, network policy settings may prevent you from completing this procedure. For more information, contact your system administrator.
- When the software has been successfully installed, the *Workbench* software icon will appear on the PC desktop.



### Upgrading Firmware

Some new releases of software will require a firmware update. The software will notify the user of the requirement to upgrade firmware upon selection of an instrument following the software update. Select

the *Upgrade Firmware* option in the drop-down list after selecting the *Instrument icon*. The instrument will begin to flash the front LED indicator to notify the user that the firmware is being updated.

## Using the Myra

The deck is divided into five SBS positions labelled A through to E. The sixth position is used for the Waste Tub.

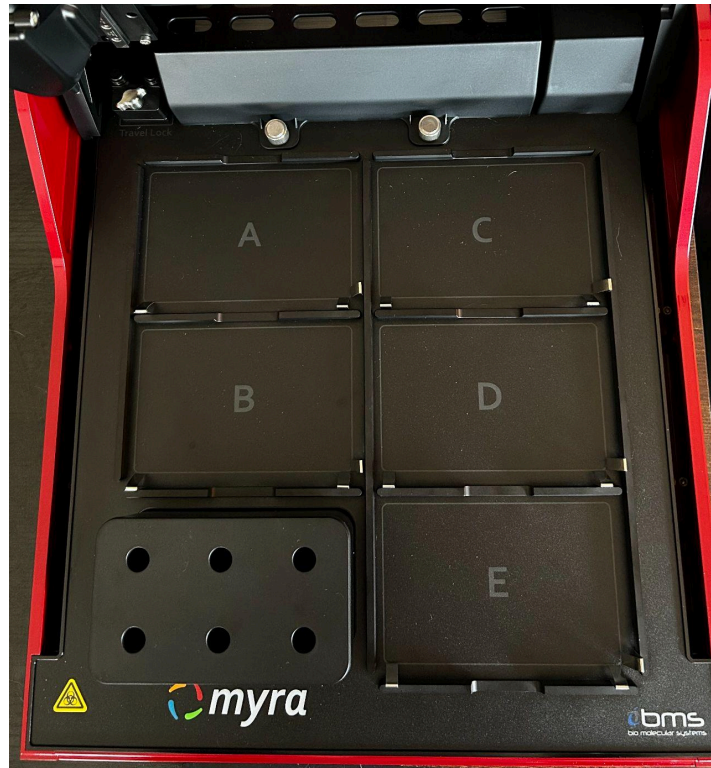


Image 2: Labeled deck positions of the Myra.

Insert the Waste Tub into the empty socket position of the deck and place the lid on top. Tips will be discarded evenly across the small holes in the lid of the waste tub using the BMS Smart-Capture-Tip™ program. The lid is designed to reduce the potential for contamination after the tips are discarded. Always empty the waste tub at the end of a run.

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**CAUTION**

Do not allow the waste tub to fill up to more than 75% of the tub volume. Over filling the waste tub will prevent the tips from being discarded and can cause damage to the head.

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The waste tub can be decontaminated with a solution containing 1 g/L available chlorine.

## MaGiC Lysis on Myra Advanced Settings

MGC recommends keeping all of the advanced settings selected as shown in the default configuration below.

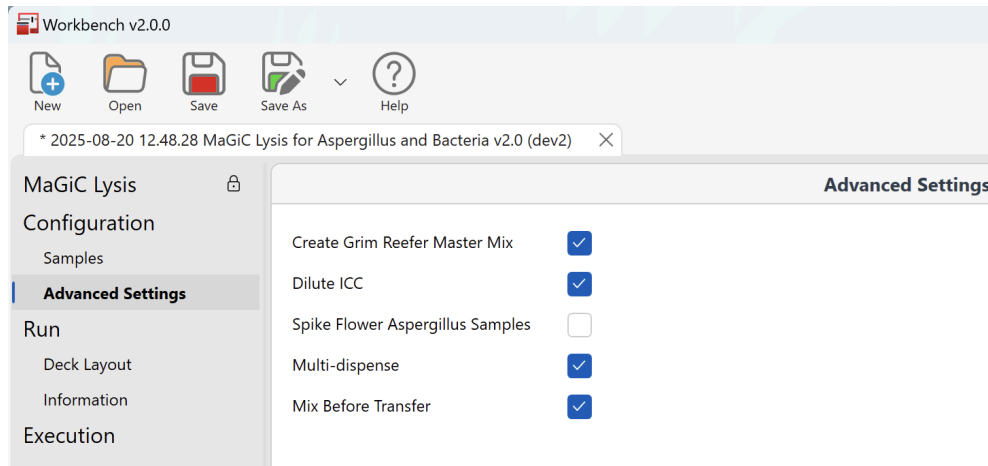


Image 3: Advanced Settings

### **Advanced Settings Descriptions:**

**Create Grim Reefer Master Mix** - Mixes the Grim Reefer Buffer and Grim Reefer Enzyme together before adding to the samples.

**Dilute IC** - Creates three internal control dilutions for sample spikes. If you already prepared these dilutions, you can deselect this option and reuse them for up to one week.

**Spike Flower Aspergillus Samples** - Adds IC, 1:50K dilution, to Aspergillus flower samples. Flower samples being tested for Aspergillus should only need synthetic IC spiked if the samples are of poor quality cannabis or hemp.

**Multi-dispense** - If checked, aspirates 50 uL of diluted IC, and dispenses into 9 samples. If not checked Myra uses a new tip to add diluted IC to each sample.

**Mix Before Transfer** - Mixes the lysed samples after the heated lysis step, then transfers them to the MaGiC Stabilization Buffer and mixes again. This mirrors the recommended manual procedure outlined in the user guide.

## Preparing to perform MaGiC Lysis on Myra

1. Open Workbench v2 software.
  - a. To open the software, double click on the Workbench v2 Icon on the desktop



Image 4: Workbench v2 Icon

2. Select the proper Myra Template to perform MaGiC Lysis:
  - a. **MaGiC Lysis for Aspergillus and Bacteria v2.0** - If prepping samples for testing on both assays
  - b. **MaGiC Lysis for Bacteria Only** - If prepping samples for bacterial tests only
  - c. Select **New+** in the top left corner if a template is already open on the Workbench software then choose the correct template

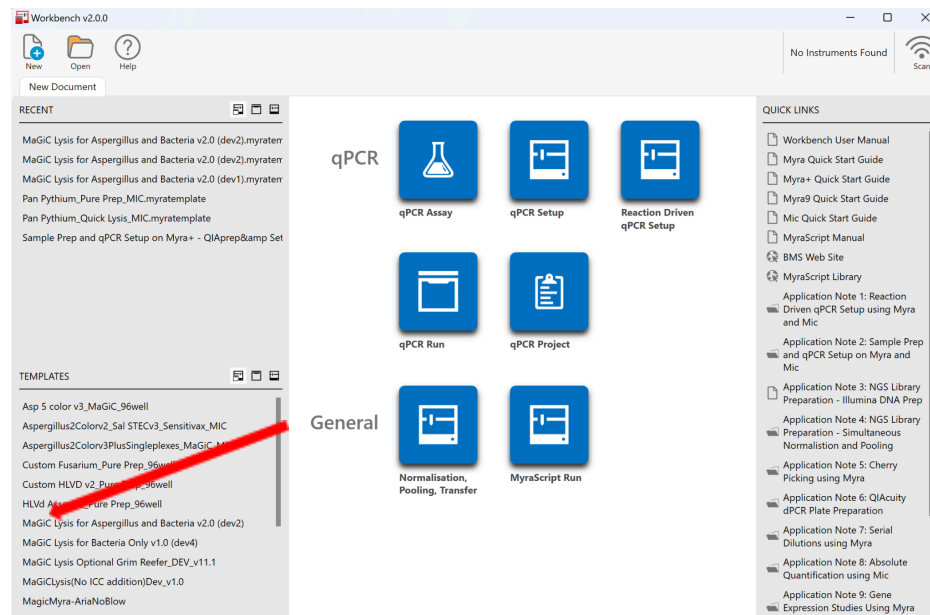
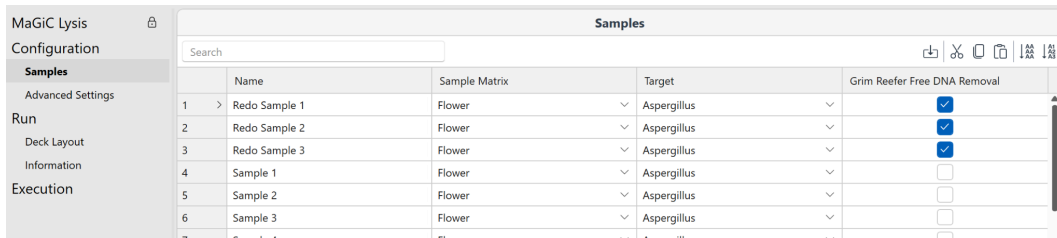


Image 5: Myra Template Selection

3. Input sample information by clicking on the *Samples* tab under Configuration.
  - a. Enter Sample Name(s)
  - b. Choose Sample Matrix type by using the drop down menu: Flower, MIP, or Chocolate.
  - c. Select the checkbox in the Grim Reefer Free DNA Removal column **only** if Grim Reefer will be used. This step applies **exclusively** to samples being tested for Aspergillus.



| Samples |               |               |             |  |                                     |
|---------|---------------|---------------|-------------|--|-------------------------------------|
|         | Name          | Sample Matrix | Target      |  | Grim Reefer Free DNA Removal        |
| 1       | Redo Sample 1 | Flower        | Aspergillus |  | <input checked="" type="checkbox"/> |
| 2       | Redo Sample 2 | Flower        | Aspergillus |  | <input checked="" type="checkbox"/> |
| 3       | Redo Sample 3 | Flower        | Aspergillus |  | <input checked="" type="checkbox"/> |
| 4       | Sample 1      | Flower        | Aspergillus |  | <input type="checkbox"/>            |
| 5       | Sample 2      | Flower        | Aspergillus |  | <input type="checkbox"/>            |
| 6       | Sample 3      | Flower        | Aspergillus |  | <input type="checkbox"/>            |

Image 6: Sample Input

4. Initiate communication with the Myra robot
  - a. Select the robot at the top right of the software and click connect to start communication with the robot.

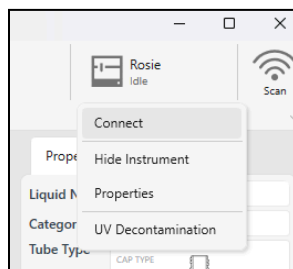


Image 7: Connect Myra

5. Designate lysed sample locations and final sample (destination) locations to the Myra Deck
  - a. Click on the *Deck layout* tab under Run.

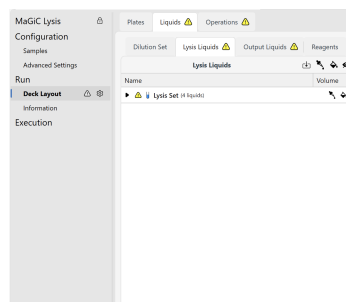


Image 8: Deck Layout

1. Click the **Lysis** or **Output Liquids** tab, then use the **fill-bucket icon** to distribute the liquids to their designated plate positions.
2. Lysed samples are placed in **position E**, and output liquids are dispensed to **position D**.

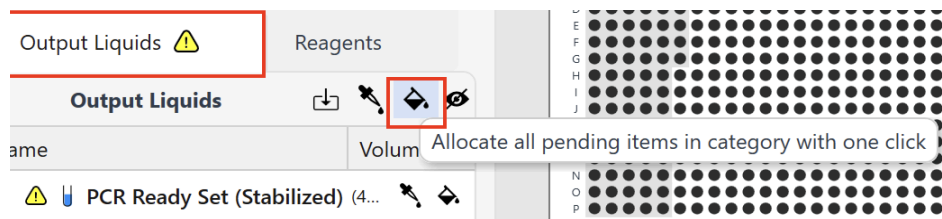


Image 9: Output Liquids Tab

3. Allocate Lysis Samples to position E.

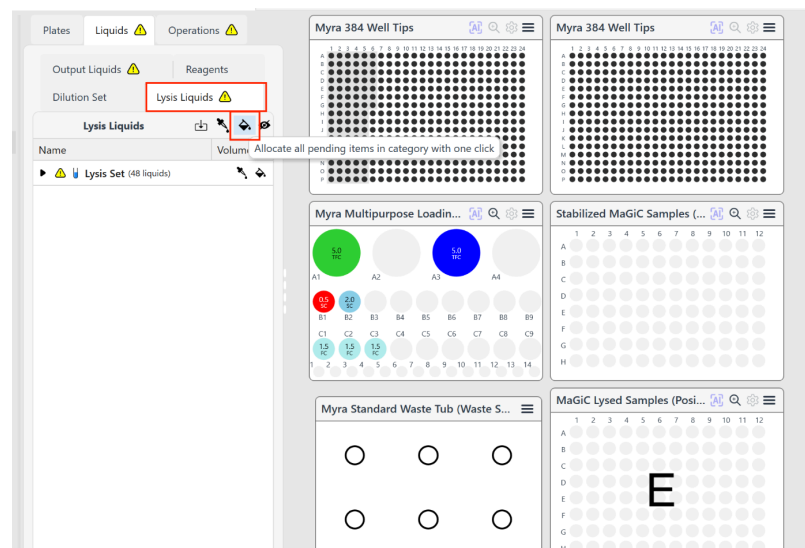


Image 10: Allocating Liquids to Pos E

4. Allocate Output Liquids to position D.

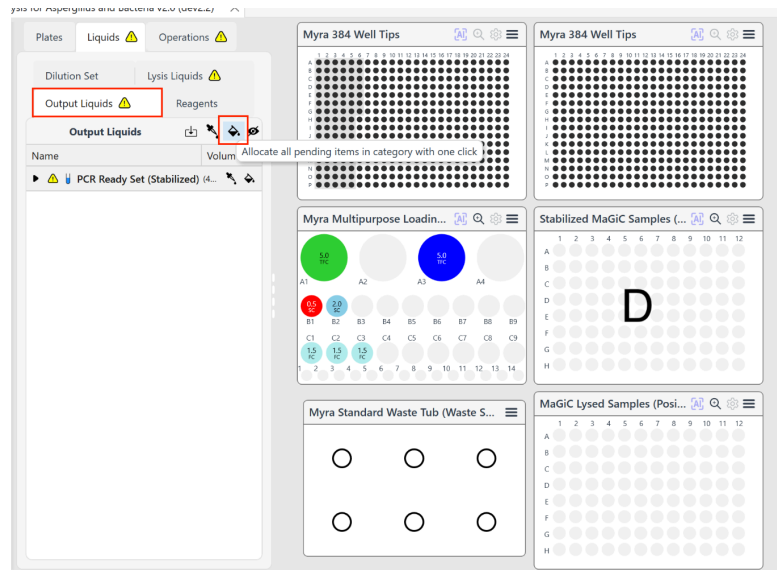


Image 11: Allocating Liquids to Pos D

5. Hover over the desired plate, then press the **space bar** to toggle the sample distribution between **column-wise** and **row-wise**. Click on well A1 to complete the liquid allocation.

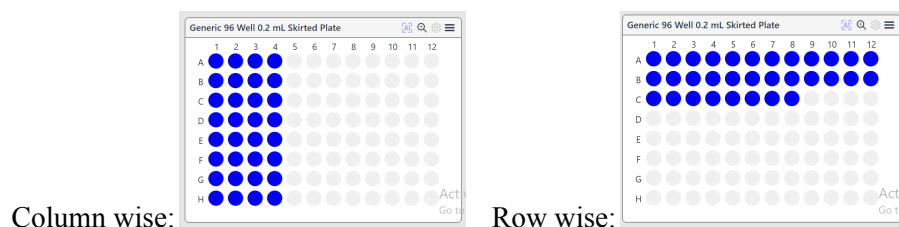


Image 12: Allocating liquids columnwise or row wise

6. Transfer reagents to deck layout

- a. Place MaGiC Lysis, Stabilization Buffer, IC, and any other necessary reagents in the Myra multipurpose loading block.

- i. Hover over each reagent in the Deck Layout to view the required volume. Add at least 10% extra volume beyond what the software requests, and place the reagents in their designated positions on the Multipurpose Loading Block. Make sure the correct tube type is selected for each reagent.
- b. Ensure that the physical tip layout matches the tip layout on the Deck Layout in the software.
- c. Ensure that the appropriate plate types, 0.2 mL fully skirted, are placed into locations D and E of the deck.

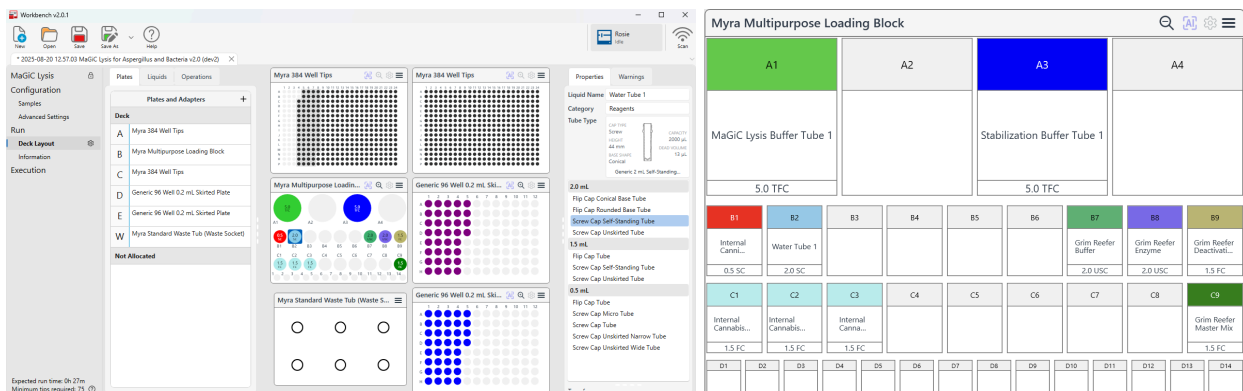


Image 13: Multipurpose Loading Block

## Running the MaGiC Lysis Myra Template

1. Press the Play button to start the run.

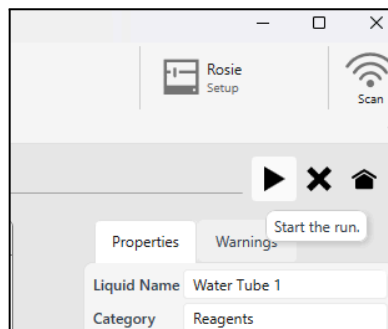


Image 14: Start Run

- a. A confirmation window will appear. Verify that all pipette tips are properly installed and that the waste tub has been emptied. Click **Start Deck Scan** to proceed.

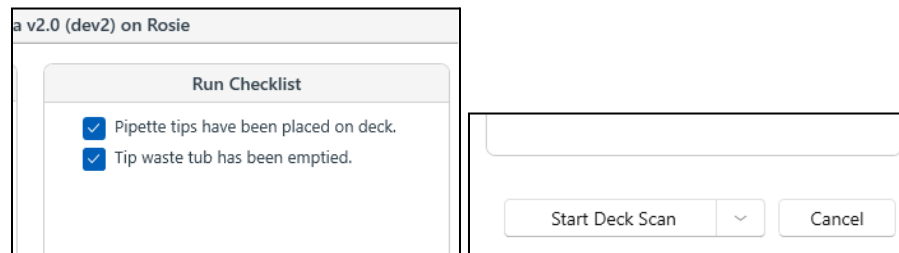


Image 15: Run Checklist and Deck Scan

- b. Once the scan is complete if all checks passed, click Start to begin the run.



Image 16: Start Run

- c. If the Deck Scan fails, fix the warnings and restart the run.

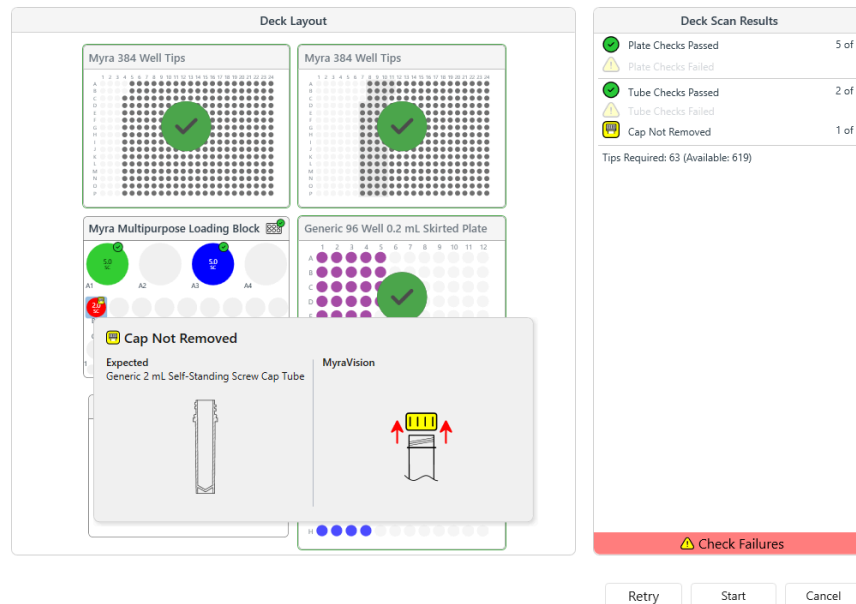


Image 17: Deck Scan Failure

Automated Steps for MaGiC Lysis without Grim Reefer treatment:

1. Myra creates IC (Internal Control) dilutions then adds MaGiC Lysis Buffer and IC to an empty 96-well PCR plate in position E.
2. Transfer enriched samples to the 96-well PCR Plate that contains MaGiC lysis and IC in position E.
  - a. Manually pipette mix 5-15 times after addition of each sample.
3. Seal and spin down the plate. Place on a thermal cycler for lysis heat step.
  - a. 95 °C for 10 minutes. Cool to 25°C.
  - b. While lysis is occurring, Click “OK” and the Myra transfers MaGiC Stabilization Buffer to clean plate in Myra deck location D.
4. Remove the lysed sample plate from the cycler, spin the plate down, and carefully remove the seal.
5. Load the lysed sample plate onto Myra deck location E and click “OK”. Myra will transfer lysed samples to the MaGiC Stabilization buffer in the plate loaded at Myra deck location D.

6. MaGiC Lysis complete. Seal the plate and store at -20 °C or continue to the qPCR Setup Template.

|                                 |                                   |                                    |    |                            |    |    |    |    |     |     |     |     |     |
|---------------------------------|-----------------------------------|------------------------------------|----|----------------------------|----|----|----|----|-----|-----|-----|-----|-----|
| Myra Multipurpose Loading Block |                                   |                                    |    |                            |    |    |    |    |     |     |     |     |     |
| A1                              |                                   | A2                                 |    | A3                         |    | A4 |    |    |     |     |     |     |     |
| MaGiC Lysis Buffer              |                                   |                                    |    | MaGiC Stabilization Buffer |    |    |    |    |     |     |     |     |     |
| 5 ml screw cap                  |                                   |                                    |    | 5 ml screw cap             |    |    |    |    |     |     |     |     |     |
| B1                              | B2                                | B3                                 | B4 | B5                         | B6 | B7 | B8 | B9 |     |     |     |     |     |
| Internal Cannabis Control       | Nuclease Free H <sub>2</sub> O    |                                    |    |                            |    |    |    |    |     |     |     |     |     |
| 0.5 ml SC                       | 2.0 ml SC                         |                                    |    |                            |    |    |    |    |     |     |     |     |     |
| C1                              | C2                                | C3                                 | C4 | C5                         | C6 | C7 | C8 | C9 |     |     |     |     |     |
| Empty tube ICC Dilution 1 1:50  | Empty tube ICC Dilution 2 1:5,000 | Empty tube ICC Dilution 3 1:50,000 |    |                            |    |    |    |    |     |     |     |     |     |
| 1.5 ml FC                       | 1.5 ml FC                         | 1.5 ml FC                          |    |                            |    |    |    |    |     |     |     |     |     |
| D1                              | D2                                | D3                                 | D4 | D5                         | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 |
|                                 |                                   |                                    |    |                            |    |    |    |    |     |     |     |     |     |

Image 18: Myra Multipurpose Loading Block Layout for MaGiC Lysis without Grim Reefer

Automated Steps for MaGiC lysis with Grim Reefer treatment:

1. Transfer enriched samples that will be treated with Grim Reefer to an empty 96-well PCR plate.
2. Once samples have been added, place the sample plate onto the deck in position E.
3. Click “OK” and Myra adds Grim Reefer Buffer and Enzyme to samples and mixes.
4. Once prompted, seal the plate and place it on the thermal cycler for Grim Reefer enzymatic step:  
37 °C for 10 minutes.
  - a. Click “OK” and Myra creates IC dilutions during the Grim Reefer incubation.
5. Once Grim Reefer incubation is complete, spin down the sample plate and carefully remove the seal.
6. Place the sample plate onto deck position E and click “OK”.
7. Myra adds GR Deactivation Buffer to Grim Reefer treated samples and mixes.
8. Myra transfers MaGiC Lysis Buffer to all sample wells.
9. Myra transfers diluted IC to all appropriate wells (hovers over samples, multi-dispenses).
10. Once prompted, remove the plate from the deck and transfer any enriched samples to the plate that will NOT be receiving Grim Reefer enzymatic treatment.
  - a. Pipette tip mix after addition of sample 5-15 times.
11. Seal plate and place on thermal cycler for lysis heat step.
  - a. 95 °C for 10 minutes. Cool to 25 °C.
12. While lysis is occurring, click “OK” and Myra transfers the MaGiC Stabilization Buffer to an empty 96-well PCR plate in position D.
13. Once heated lysis is complete remove the lysed sample plate from the cycler, spin the plate down, and carefully remove the plate seal.
14. Place lysed sample plate on Myra deck location E and click “OK”.
15. Myra transfers lysed samples to plate with MaGiC Stabilization buffer on Myra deck location D.
  - a. If “**Mix Before Transfer**” is checked in the advanced settings the Myra will mix the lysed samples before transferring to the stabilization buffer and mix again.
16. MaGiC Lysis complete. Seal plate and store at -20 °C or continue to qPCR Setup Template.

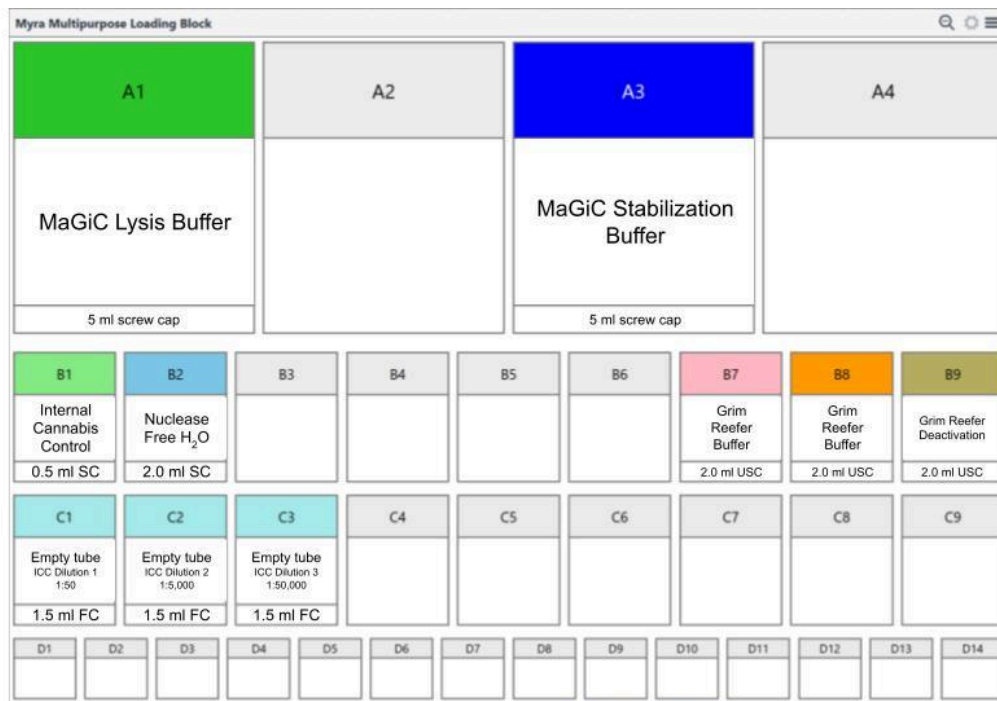


Image 19: Myra Multipurpose Loading Block Layout for MaGiC Lysis with Grim Reefer

#### Myra Setup for MaGiC Lysis for Bacterial Testing (only), NO Grim Reefer

Can be used for the following Assays with MaGiC Lysis:

- Salmonella & STEC
- Listeria
- Pseudomonas & Staphylococcus

1. Transfer enriched samples to 96-well PCR Plate and place the plate or tubes onto the deck in position E and click “OK”
2. Myra transfers 50 uL MaGiC Lysis Buffer to all sample wells.
3. Myra transfers diluted IC to all appropriate wells (hovers over samples, multi-dispense).
4. When prompted, remove the plate from the deck. Seal the plate and spin it down. Place on thermal cycler for lysis heat step.
  - a. 95 °C for 10 minutes. Cool to 25 °C.

5. Once heated lysis is complete remove the lysed sample plate from the cycler, spin the plate down, and carefully remove the plate seal.
6. Place lysed sample plate onto Myra deck location E.
7. Myra transfers the MaGiC Stabilization Buffer to all lysed samples.
8. MaGiC Lysis complete. Seal plate and store at -20 °C or continue to qPCR Setup Template.

## Appendix I: Troubleshooting

In the instance that results are not as expected, a support package will be requested to aid in troubleshooting

1. In the workbench software click the Help ? button and select Create Support Package.
2. Choose the save location, then select save.
3. Support Package files are often too large to send by email. You can share them instead using a Google Drive link, Dropbox, or another file-sharing service

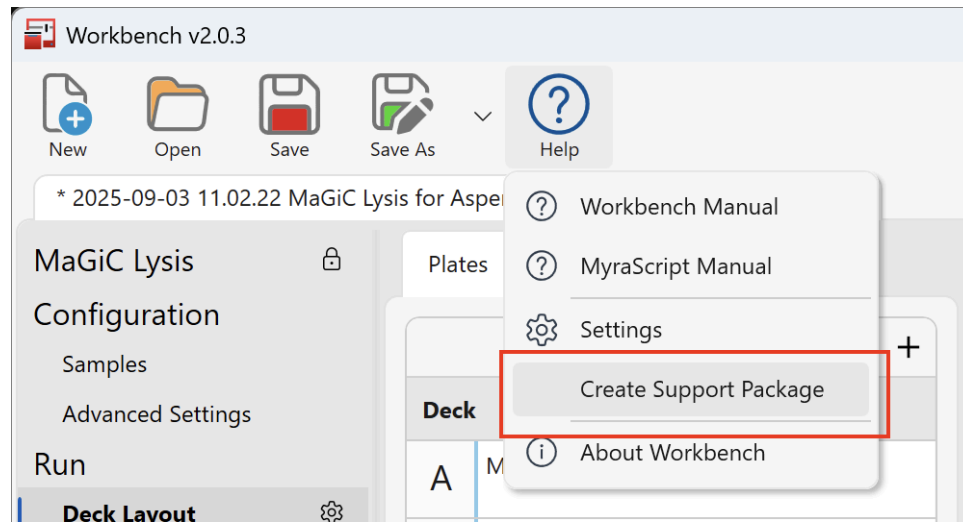


Image 20: Create Support Package

## REVISION HISTORY

| Version | Date      | Description                                   |
|---------|-----------|-----------------------------------------------|
| v1      | June 2025 | Automation Release                            |
| v2      | Nov 2025  | Workbench v2 updates included in the document |

## DISCLAIMER

This test was developed, and its performance characteristics determined by Medicinal Genomics Company, for laboratory use. Any deviations from this protocol are not supported by MGC. The results may vary based on laboratory conditions.

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