SIGNALCHEM
DIAGNOSTICS

User Manual

SignalChem Diagnostics

Fusarium oxysporum One-Pot Detection Kit

To enable point-of-care testing for the immediate detection of Fusarium oxysporum in plant samples

Diagnostic Reagents For Accurate And Reproducible Results

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Introduction

Testing kit designed for early rapid detection of pathogens in plants. The kit is self sufficient, so there is no need for the end user to send samples elsewhere for analysis. The kit is designed to work with an instrument (CRISPOT Detection Device, Cat# CSP01-V19A, SOLD SEPARATELY), which screens for the presence of a portion of the pathogen's genome in all samples, thus identifying infected plants. It is important for the end-user to label the samples according to the plants they were extracted from to avoid confusion. The user is expected to spend around 30 minutes on sample preparation and setting up the device. Once set-up is complete, running the test on the detection device will take 25 minutes.

Disclosure

This product is not to be used as a drug, medical device, food additive, cosmetic, or household chemical. It is not to be used in therapeutic, consumer, or pesticidal applications. Not for resale.

Support

For inquires and assistance, please contact us at:
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Table of Contents

Kit Components

Starter Kit-Only Components

#	Component	Amount
1	Tube Rack	1
2	Magnetic Rack	1
3	200 µL Pipette (grey plunger)	1
4	25 µL Pipette (green plunger)	1

Not Provided

Gloves
Pipette tips
(not included with test kits, available as a separate add-on)

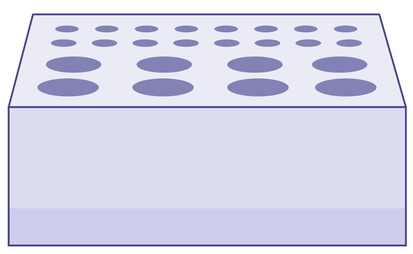
Standard Kit Components

#	Component	Amount
5	Pipette Tips	170
6	Grommets	16
7	Red PCR tube strips with Lysis buffer	2 (8-well) red strip tubes
8	PCR tube strips with Buffer-Bead Mix	2 (8-well) strip tubes
9	Wash Buffer A	7 mL
10	Wash Buffer B	7 mL
11	Elution Buffer	750 µL
12	PCR tube strips with Reaction Buffer	2 (8-well) blue strip tubes
13	PCR tube strips with Master Mix	2 (8-well) strip tubes
14	User Manual	1

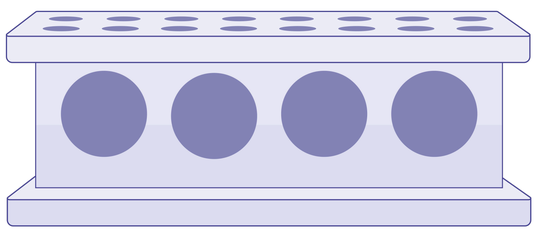
Kit Components: Visual Guide

Starter Kit-Only

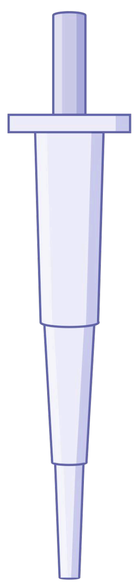
1 Tube Rack



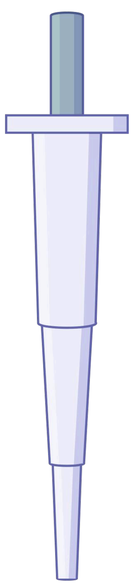
2 Magnetic Rack



3 200 µL Pipette (grey plunger)

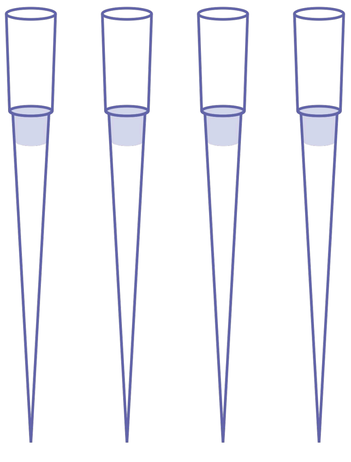


4 25 µL Pipette (green plunger)

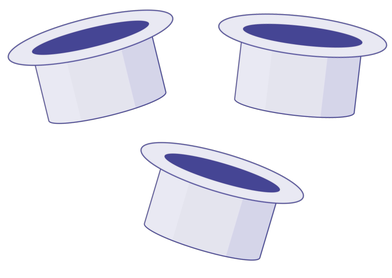


Standard Kit

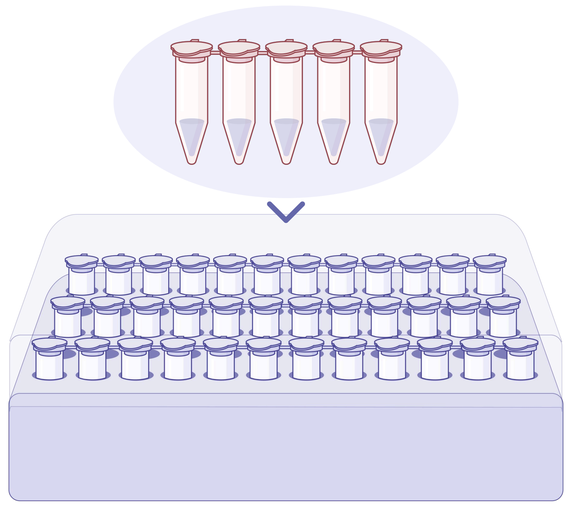
5 Pipette Tips



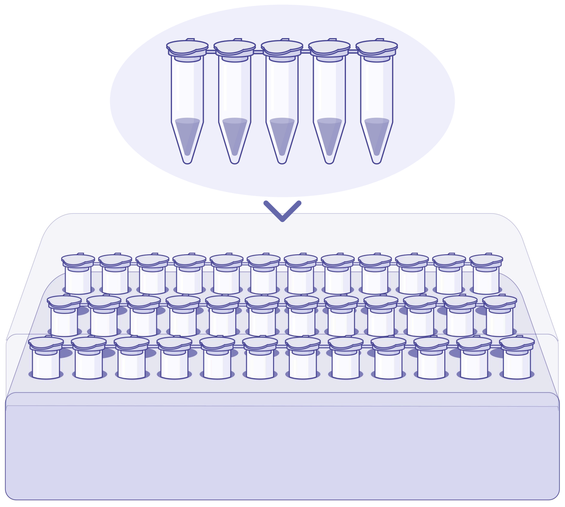
6 Grommets



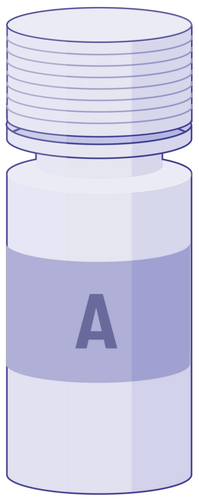
7 Red PCR tube strips with Lysis buffer



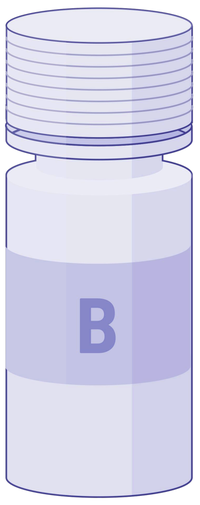
8 PCR tube strips with Buffer-Bead Mix



9 Wash Buffer A



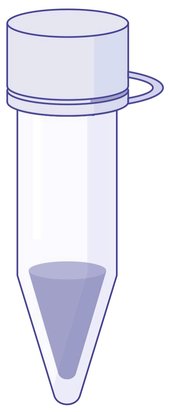
10 Wash Buffer B



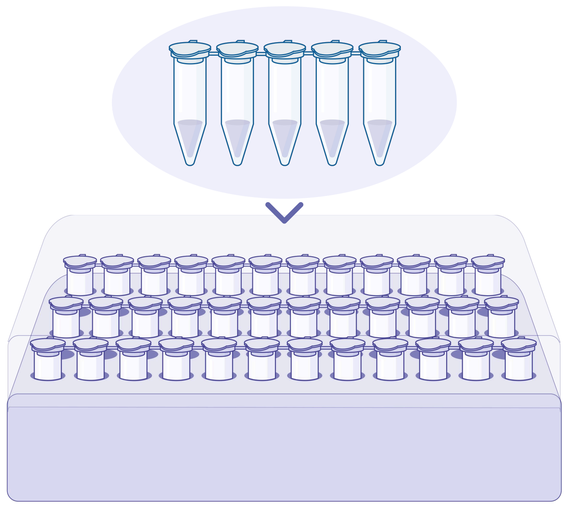
Kit Components: Visual Guide

Standard Kit (Continued)

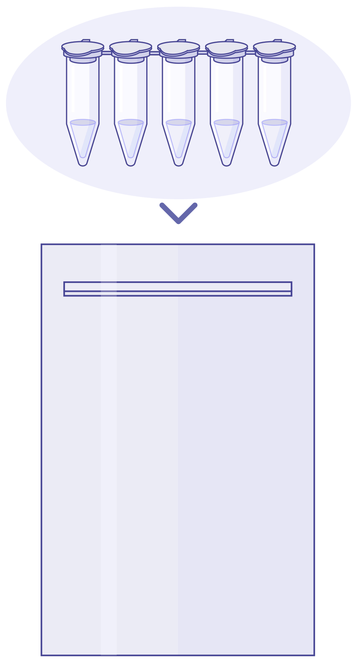
11 Elution Buffer



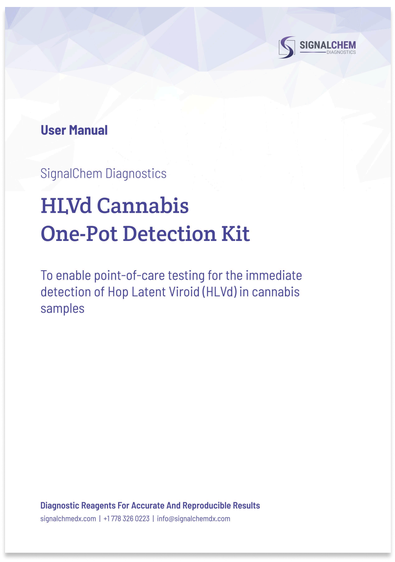
12 Blue PCR tube strips with Reaction Buffer



13 PCR tube strips with Master Mix



14 User Manual



Storage and Precautions

Kit Storage

Store all kit components at 2-25°C for up to 6 months.

The premixtures in the PCR tubes (component 13) should be protected from light. The foil bag with desiccant offers light and moisture protection as long as the bag is tightly closed. Always keep the strips in the bag when not in use, as exposure to light can cause deterioration and lead to inaccurate results.

Precautions

- Ensure the working environment is clean before starting the experiment.
- Always wear a new pair of examination gloves when handling samples and performing the assay.
- Remove the appropriate number for tubes from the strip tubes containing the buffers and pre-mix based on the number of samples being tested.
- The presence of inhibitors can lead to invalid or false-negative results.
- Mutations in the target regions of the Fusarium oxysporum genome, covered by the primers in this kit, may prevent the detection of the pathogen.
- Adhere to good laboratory practices to ensure proper use of this kit. Keep both the kit and reactions free from contamination. Carefully inspect all reagents for signs of contamination, and do not use any reagents that appear contaminated.

Sample Preparation

Protocol

1. Using the provided clean grommet (6), collect plant tissue from areas with suspected infection. Collect either two stem pieces, two petiole pieces, or four leaf pieces, and place them directly into a red tube containing lysis buffer (7). Close the lid securely.
    a. Folding or stacking of layers of leaves can be done to save time.
    b. Do no exceed four discs, as the purification process can be overloaded.
2. Incubate the tube with leaf discs and lysis buffer in the CRISPOT device using the heating program.
    a. Using the top and middle button of the portable device, select the heating program.
    b. Start the program by pressing the bottom button.
3. Transfer the entire volume of lysis buffer into a tube containing the Buffer-Bead Mix (8) using the 200 µL pipette (3). Mix thoroughly by pipetting up and down several times, then incubate in the CRISPOT device using the heating program.
4. Place the tube on the magnetic rack (2) to allow the beads to collect next to the magnet.
5. Remove the buffer without disturbing the pellet of beads using the 200 µL Pipette (3).
6. Remove the tube from the magnetic rack (2) and resuspend the beads in Wash Buffer A (9) using the 200 µL pipette (3).
7. Repeat steps 4 to 6 again for a second wash with Wash Buffer A (9).
8. Repeat steps 4 to 7 using Wash Buffer B (10), for a total of 4 washes (2 using Wash Buffer A and 2 with Wash Buffer B).
9. For the final wash, leave the tube on the magnetic rack (2) and use the 200 µL pipette (3) to remove any remaining wash buffer without disturbing the beads.
10. Allow the beads to dry at room temperature for 5 minutes, uncovered, on the magnetic rack (2).
    a. Ensure as much wash buffer as possible is removed, as any residual wash buffer can inhibit the reaction and lead to false negatives.
    b. Do not allow the beads to over-dry, as this may make it difficult to elute the target material.
11. Remove the tube from the magnetic rack (2) and resuspend the beads in Elution Buffer (11) using the 25 µL pipette (4).
12. Incubate the tube in the CRISPOT device using the heating program.
13. Place the tube on the magnetic rack (2) to allow magnetic beads to collect next to the magnet.
14. Using the 25 µL pipette (4), transfer the entire liquid into a new tube with Reaction Buffer (12), avoiding disturbance of the beads.
15. Mix thoroughly by pipetting up and down using the 25 µL pipette (4) and transfer 25 µL of the diluted reaction buffer into a tube containing Master Mix (13).
16. Mix the solution by pipetting up and down using the 25 µL pipette (4). Close the lid and place into the CRISPOT machine. Run the test using Program 1.
    a. If a microcentrifuge is available, briefly centrifuge the tube to bring the entire volume to the bottom and eliminate any air bubbles.

Sample Preparation

Protocol (Continued)

17. After the run is completed, the Fusarium oxysporum infection status of each sample will be displayed: red for positive and green for negative.
    a. Record the results by writing them down or taking a photo, as they will be erased if any buttons are pressed or the machine is turned off.

Using the Pipette

The pipettes are calibrated to either 25 µL (green plunger) or 200 µL (grey plunger).

1. Press the plunger down to the first stop.
2. Insert the pipette tip into the liquid.
3. Slowly release the plunger to draw up the desired volume.
4. Move the tip to the target container.
5. Press the plunger firmly to the stop to dispense the entire volume.
6. While keeping the plunger pressed, withdraw the tip from the liquid to avoid drawing any back in.

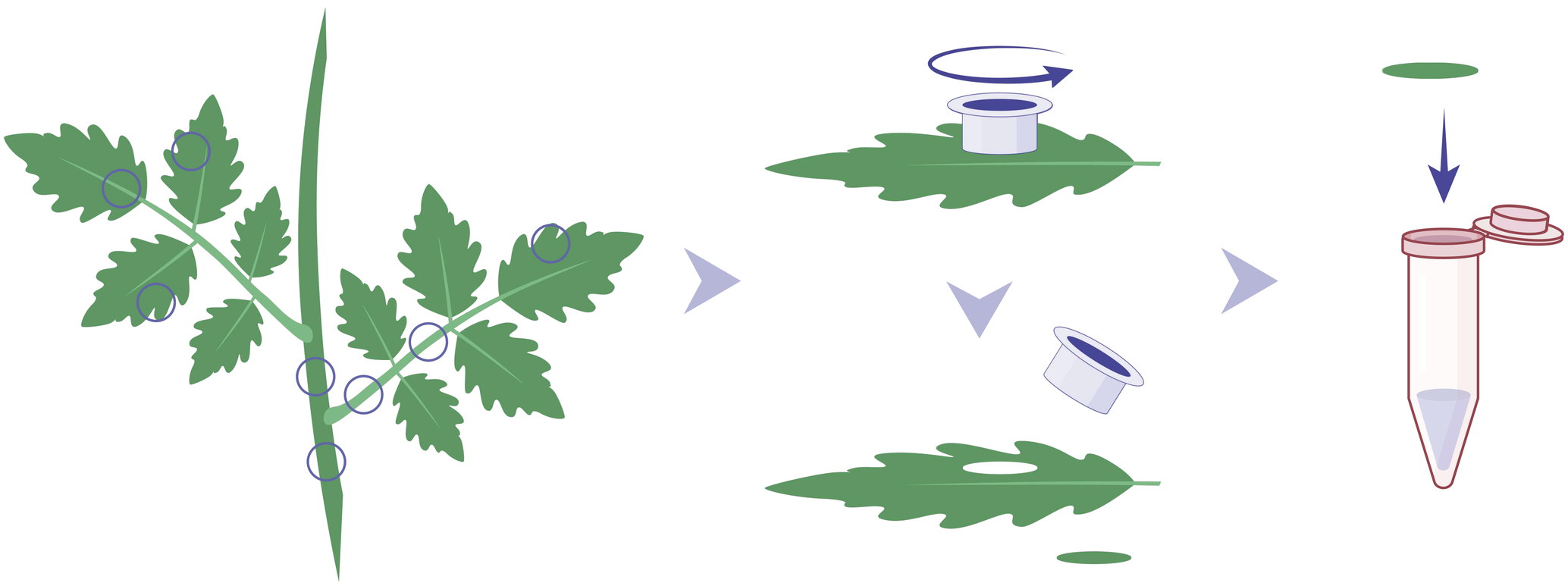
Warning

- Ensure all plant material is fully submerged in the lysis buffer before incubating in the CRISPOT device.
- Change gloves and grommets between each sampling to avoid cross-contamination.
- Use a new pipette tip for each sample transfer or wash to prevent cross-contamination.
- Dispose of used materials in the regular trash.

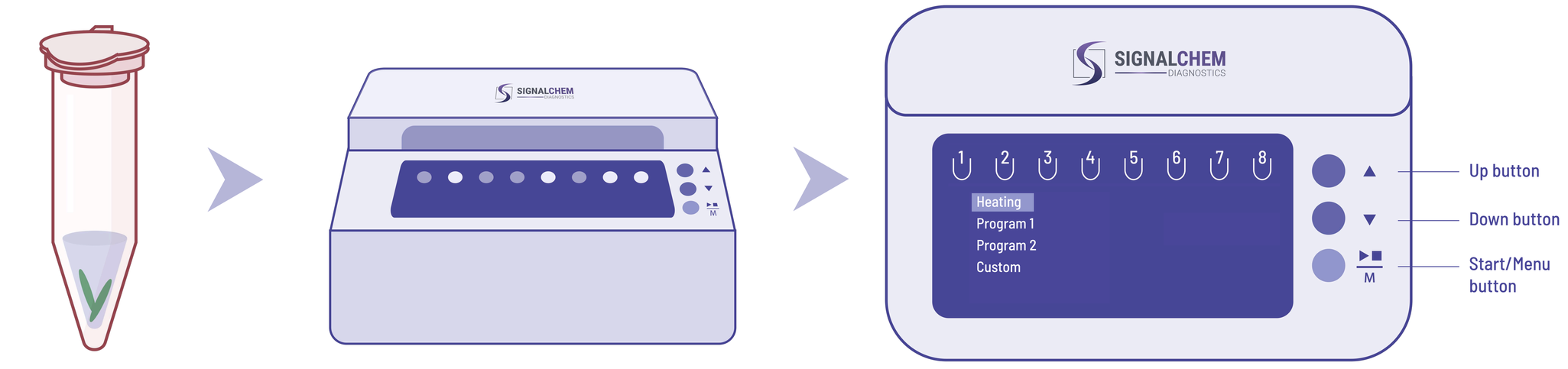
Sample Preparation: Visual Guide

Protocol

1. Using the provided clean grommet (6), collect plant tissue from areas with suspected infection. Collect either two stem pieces, two petiole pieces, or four leaf pieces, and place them directly into a red tube containing lysis buffer (7). Close the lid securely.
    a. Folding or stacking of layers of leaves can be done to save time.
    b. Do no exceed four discs, as the purification process can be overloaded.



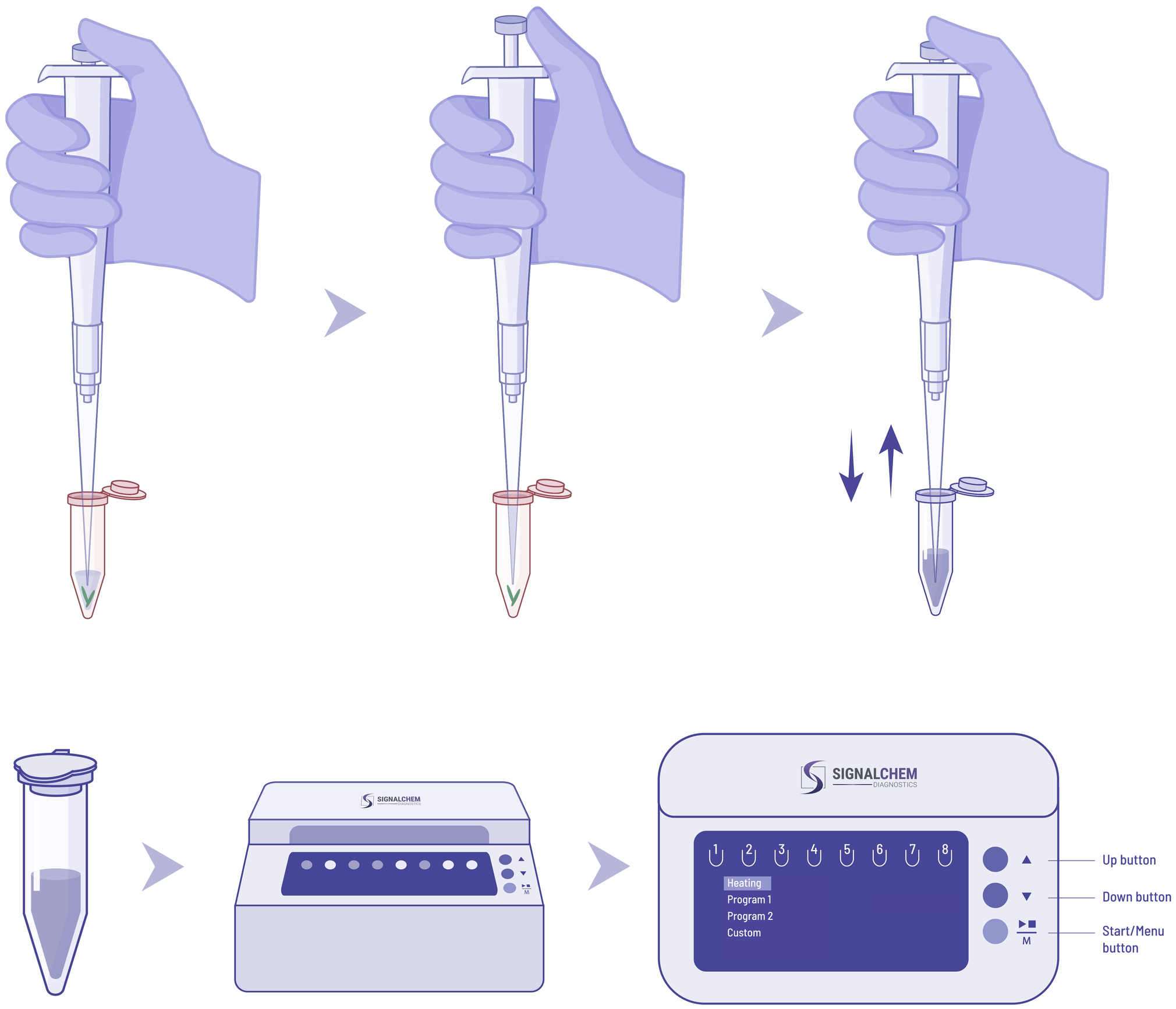
2. Incubate the tube with leaf discs and lysis buffer in the CRISPOT device using the heating program.
    a. Using the top and middle button of the portable device, select the heating program.
    b. Start the program by pressing the bottom button.



Sample Preparation: Visual Guide

Protocol

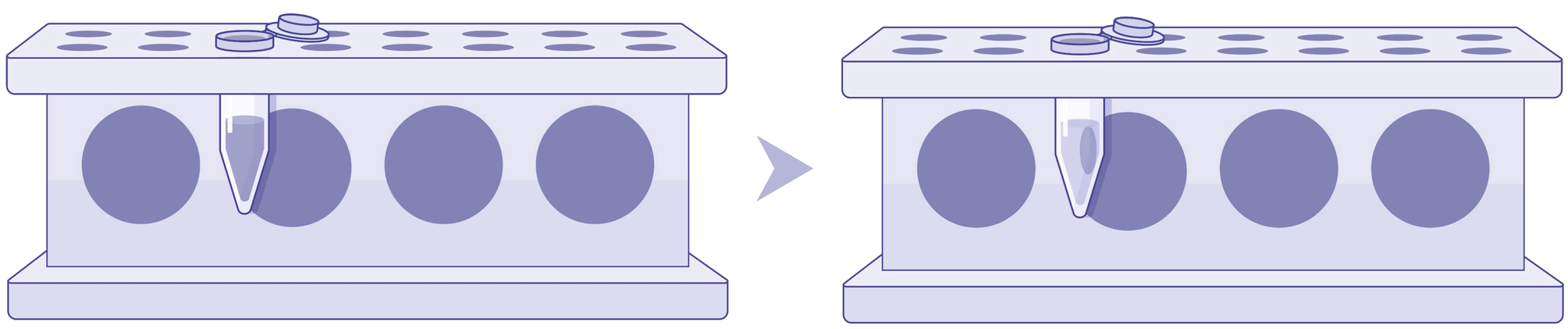
3. Transfer the entire volume of lysis buffer into a tube containing the Buffer-Bead Mix (8) using the 200 µL pipette (3). Mix thoroughly by pipetting up and down several times, then incubate in the CRISPOT device using the heating program.



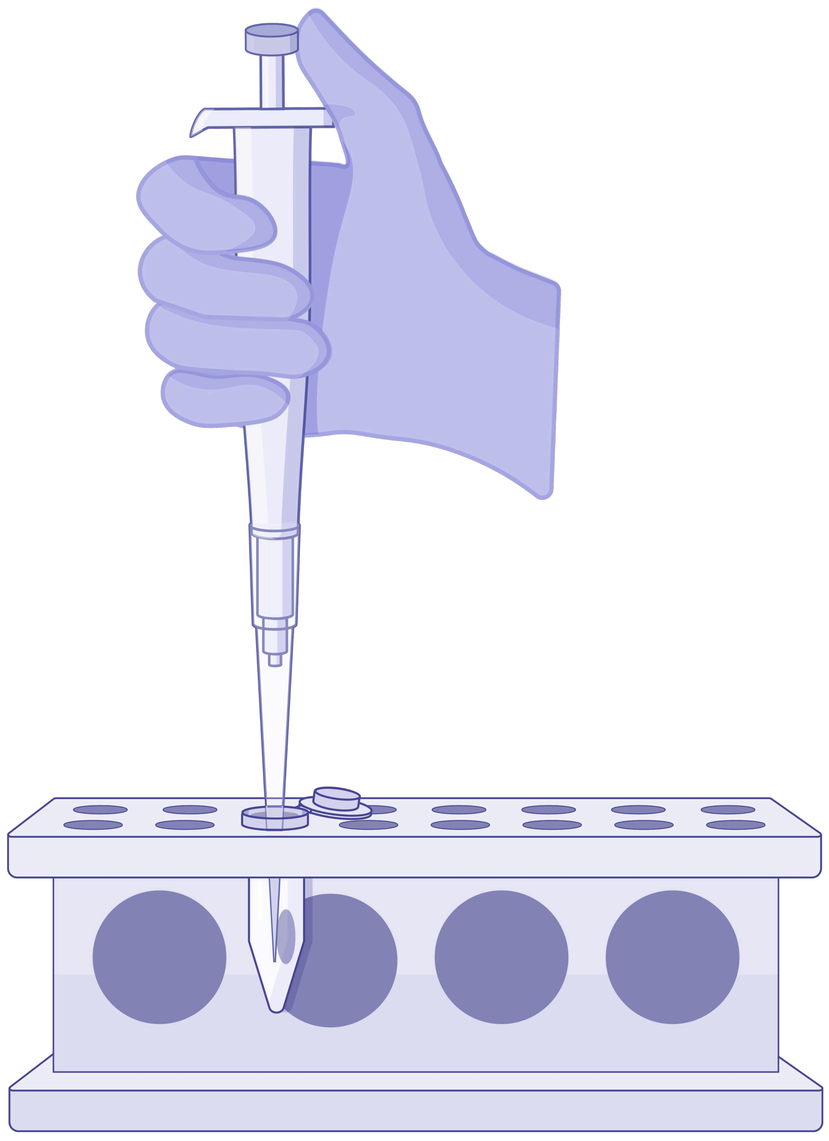
Sample Preparation: Visual Guide

Protocol

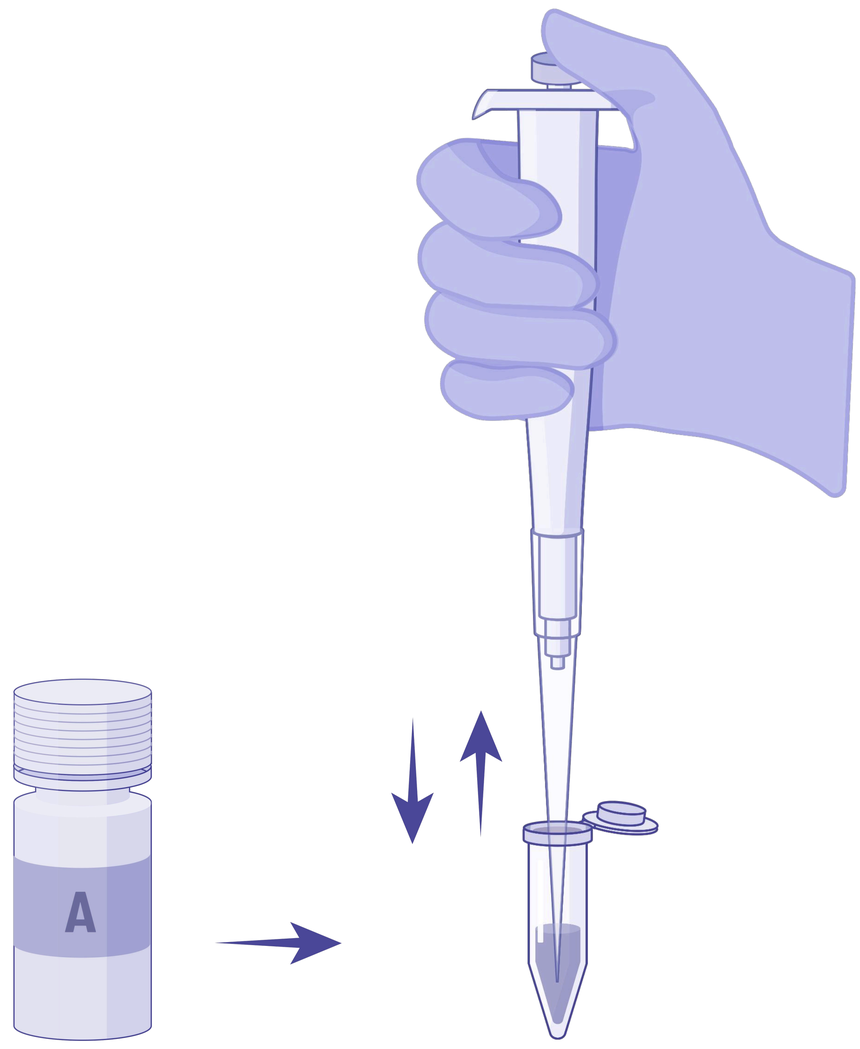
4. Place the tube on the magnetic rack 2 to allow the beads to collect next to the magnet.



5. Remove the buffer without disturbing the pellet of beads using the 200 µL Pipette 3.



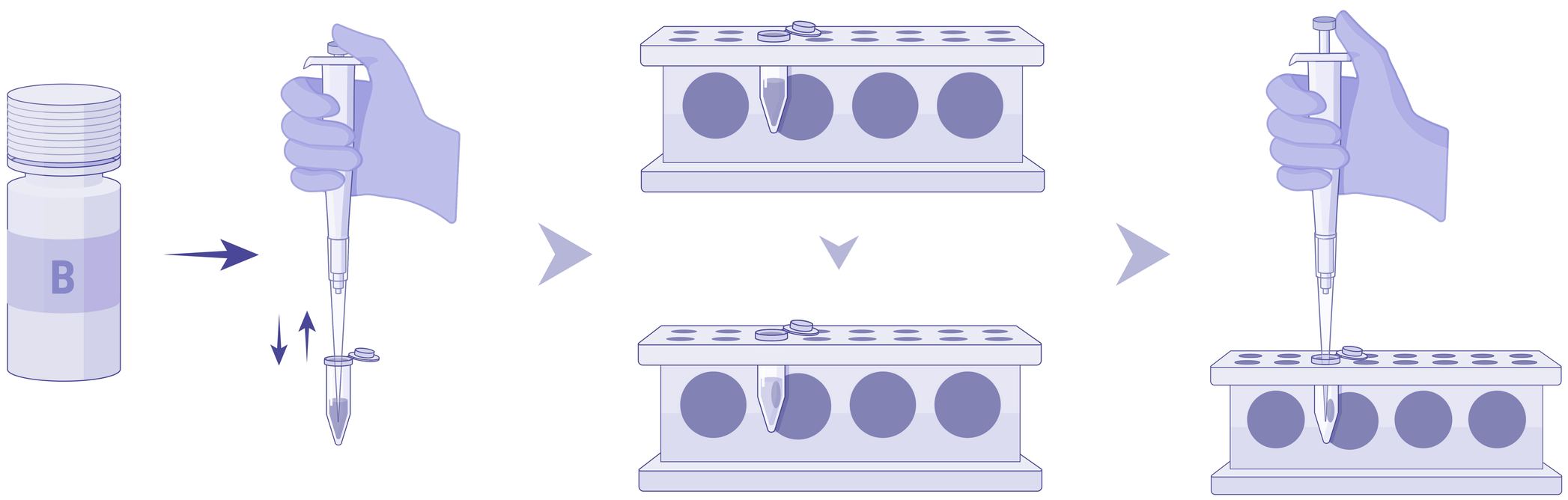
6. Remove the tube from the magnetic rack 2 and resuspend the beads in Wash Buffer A 9 using the 200 µL pipette 3.



Sample Preparation: Visual Guide

Protocol

7. Repeat steps 4 to 6 again for a second wash with Wash Buffer A (9).
8. Repeat steps 4 to 7 using Wash Buffer B (10), for a total of 4 washes (2 using Wash Buffer A and 2 with Wash Buffer B).
9. For the final wash, leave the tube on the magnetic rack (2) and use the 200 µL pipette (3) to remove any remaining wash buffer without disturbing the beads.



10. Allow the beads to dry at room temperature for 5 minutes, uncovered, on the magnetic rack (2).
    a. Ensure as much wash buffer as possible is removed, as any residual wash buffer can inhibit the reaction and lead to false negatives.
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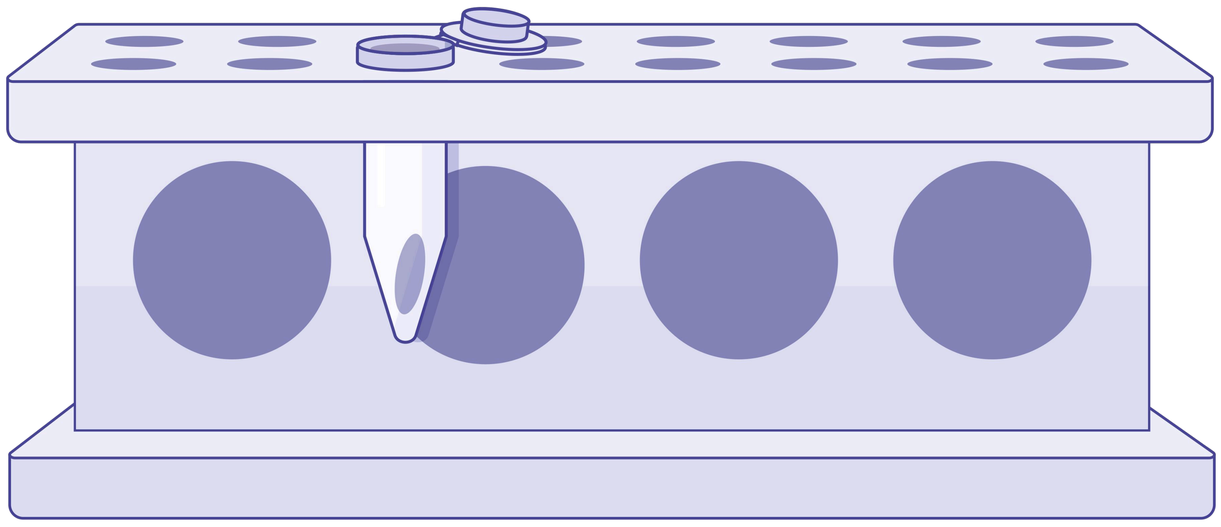
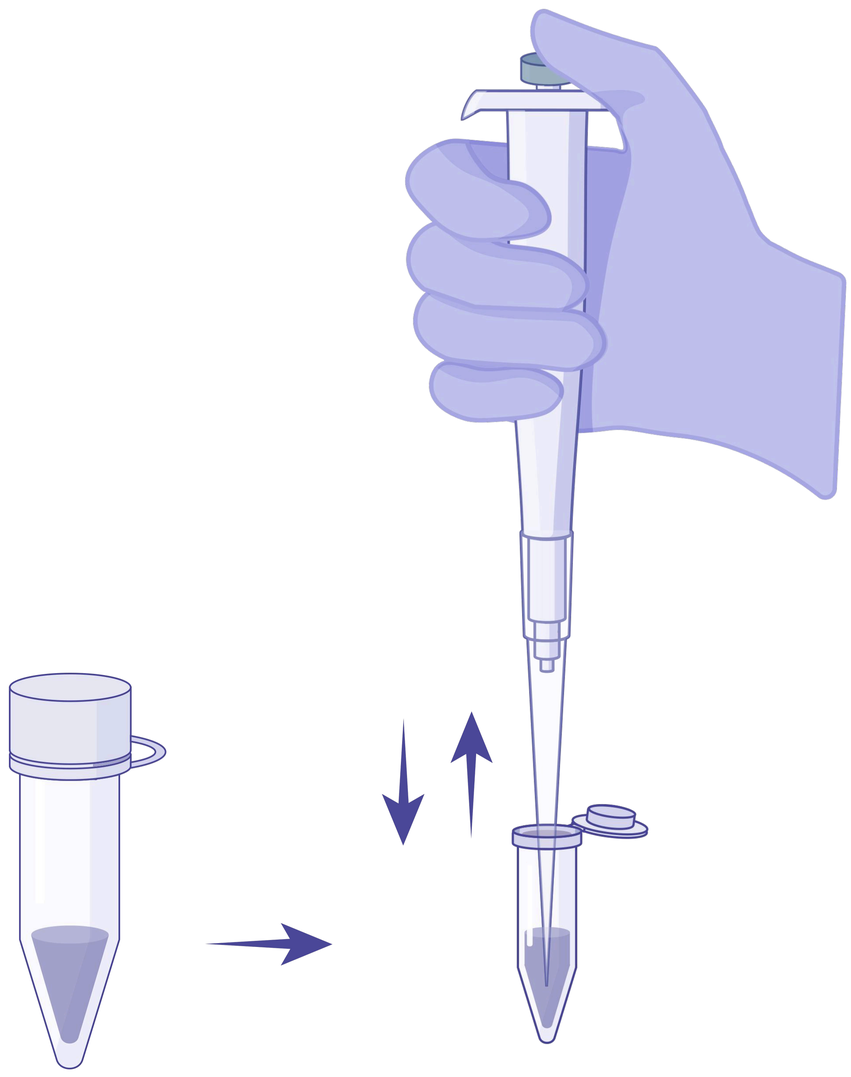


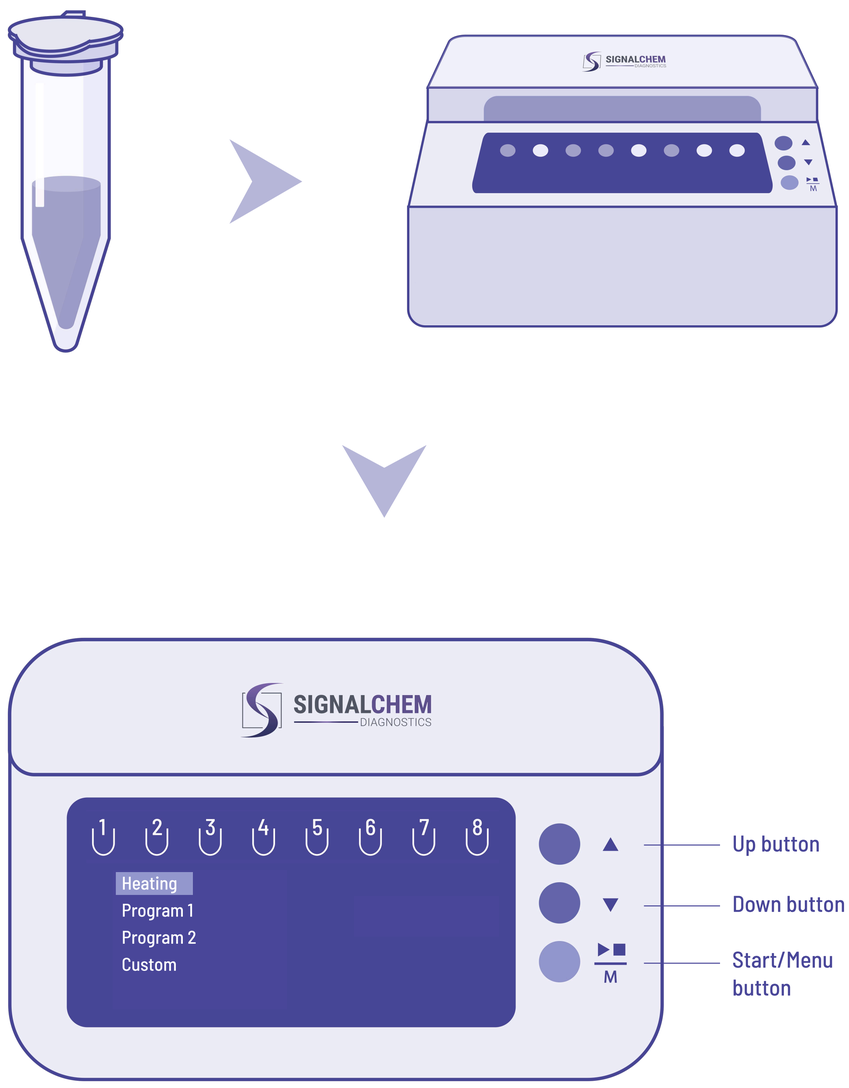
Sample Preparation: Visual Guide

Protocol

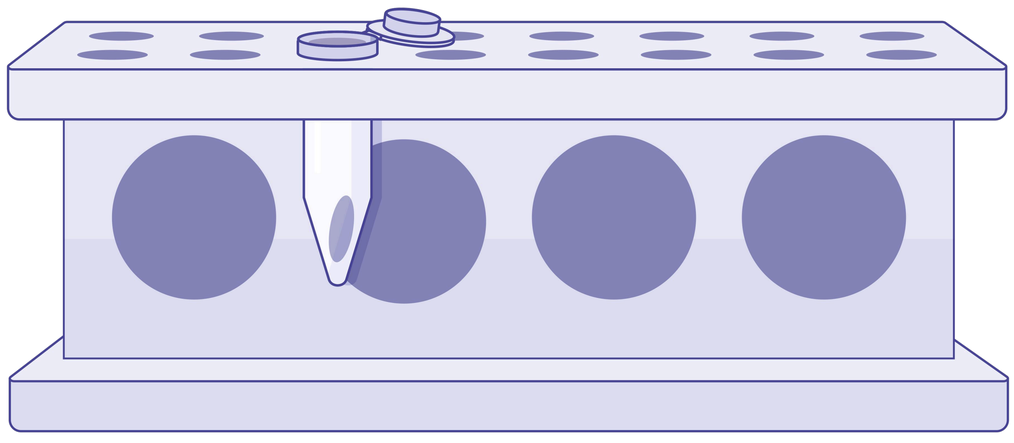
11. Remove the tube from the magnetic rack (2) and resuspend the beads in Elution Buffer (11) using the 25 µL pipette (4).



12. Incubate the tube in the CRISPOT device using the heating program.



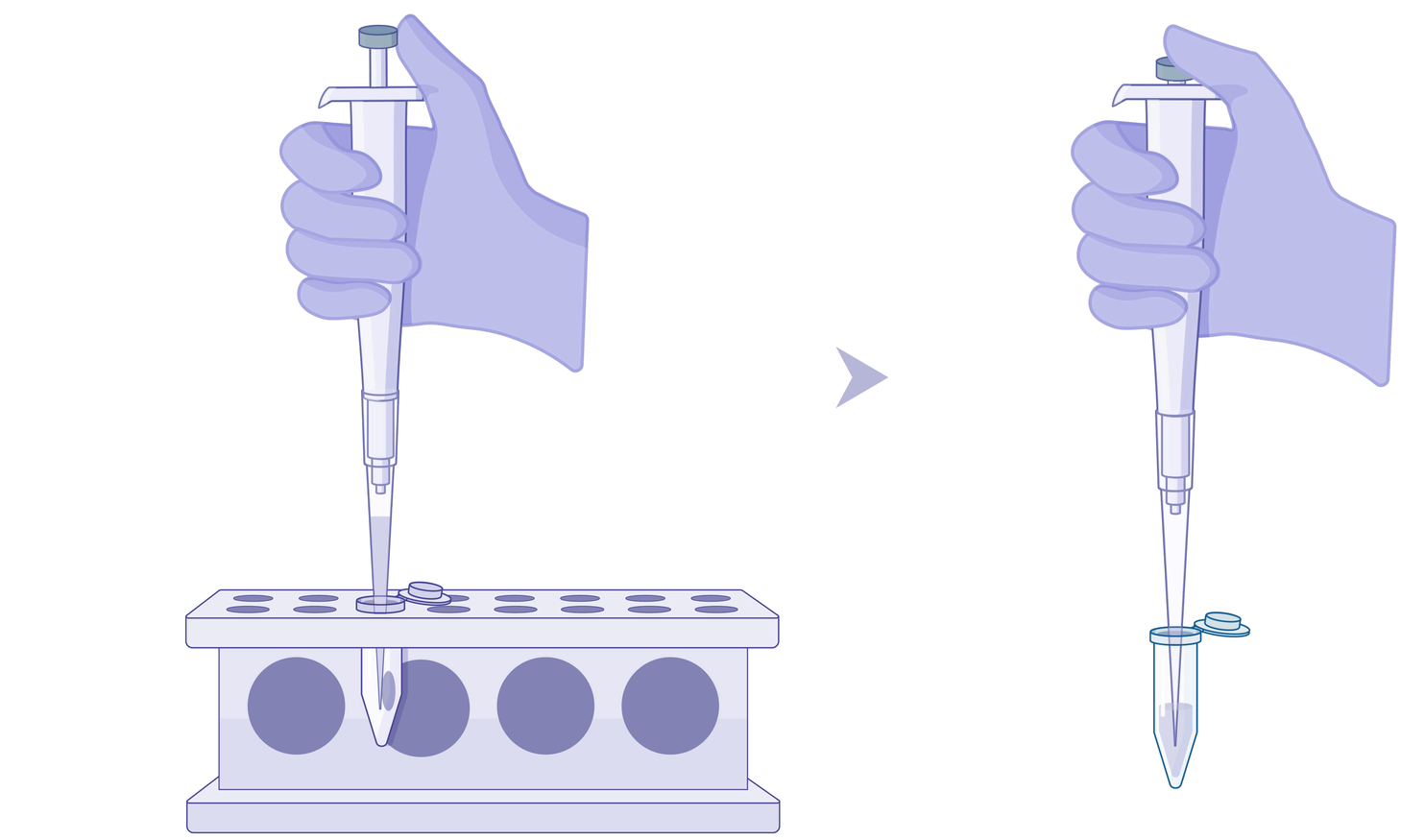
13. Place the tube on the magnetic rack (2) to allow magnetic beads to collect next to the magnet.



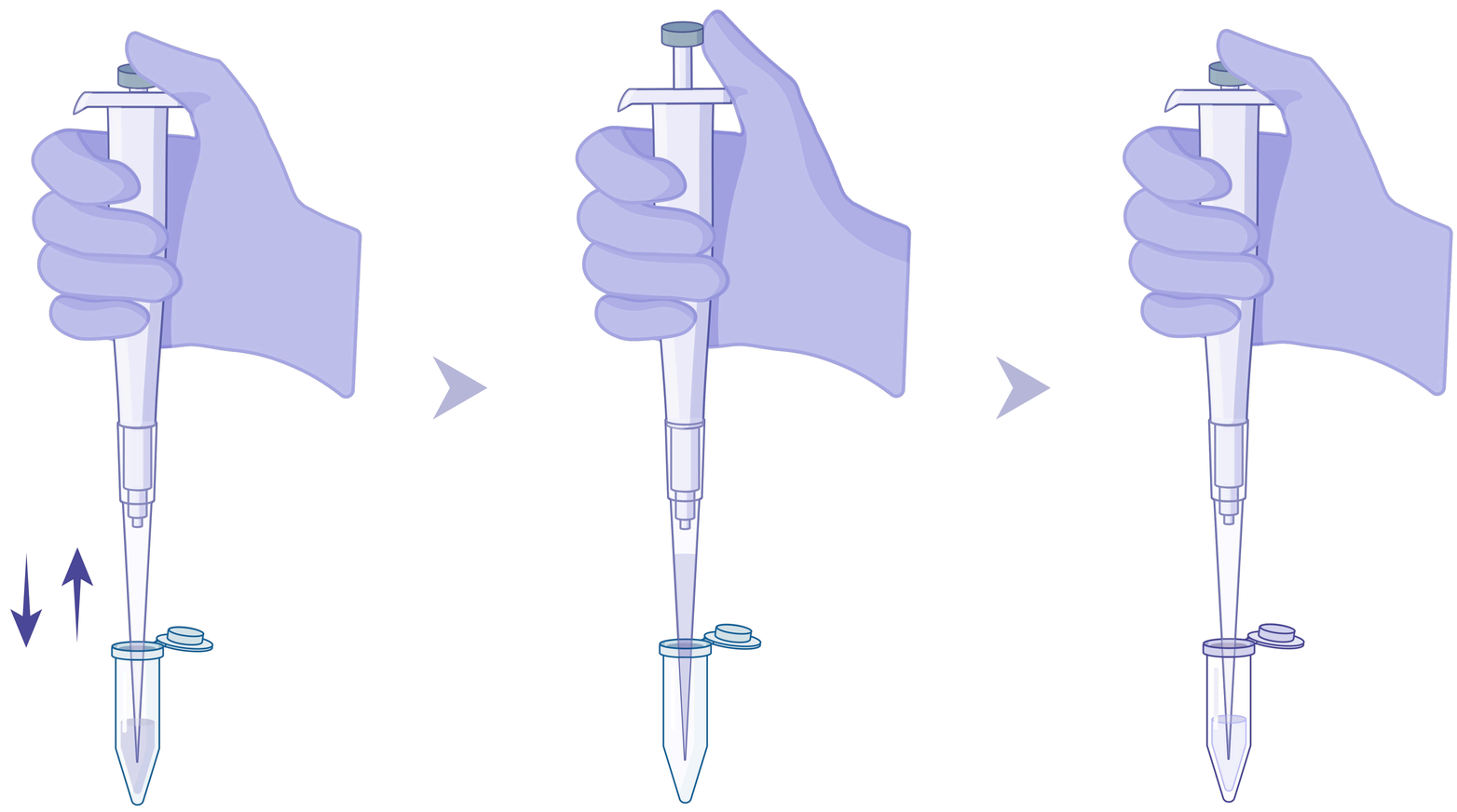
Sample Preparation: Visual Guide

Protocol

14. Using the 25 µL pipette (4), transfer the entire liquid into a new tube with Reaction Buffer (12), avoiding disturbance of the beads.



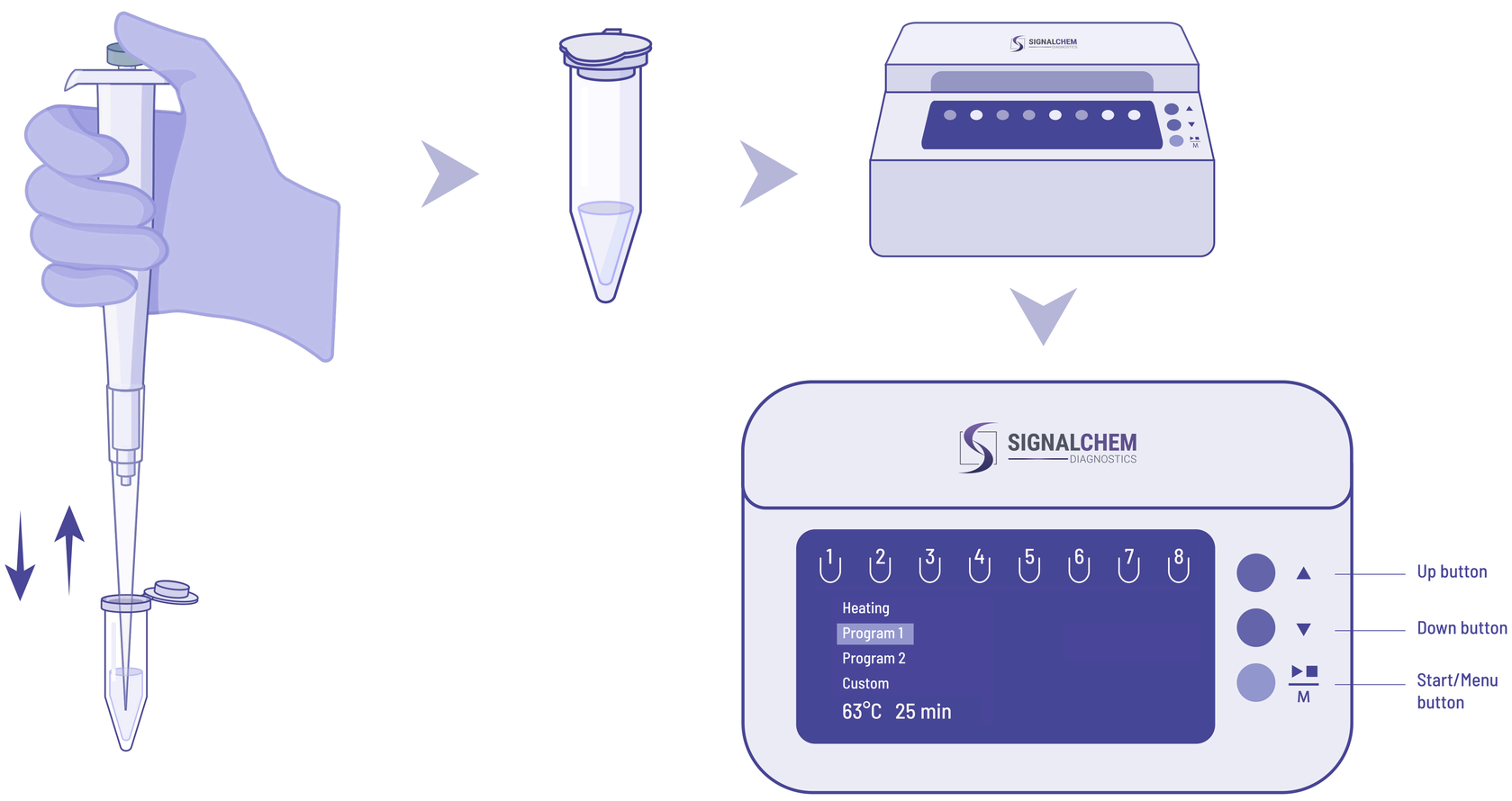
15. Mix thoroughly by pipetting up and down using the 25 µL pipette (4) and transfer 25 µL of the diluted reaction buffer into a tube containing Master Mix (13).



Sample Preparation: Visual Guide

Protocol

16. Mix the solution by pipetting up and down using the 25 µL pipette (4). Close the lid and place into the CRISPOT machine. Run the test using Program 1.
    a. If a microcentrifuge is available, briefly centrifuge the tube to bring the entire volume to the bottom and eliminate any air bubbles.



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