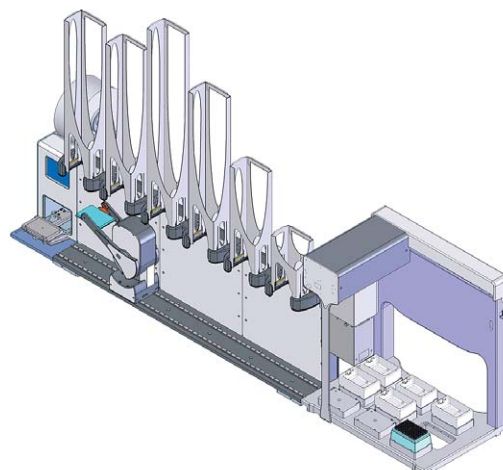
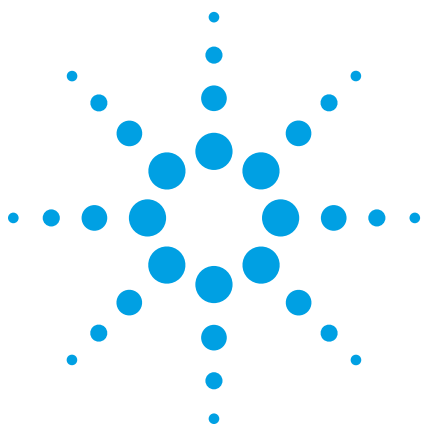


Agilent gDNA Isolation Workstation Application Bulletin



gDNA Isolation Workstation consisting of an Agilent PlateLoc Thermal Microplate Sealer (left), Agilent BenchCel Microplate Handling Workstation (center), and an Agilent Bravo Automated Liquid Handling Platform (right).

Summary

- A flexible workstation providing high-throughput gDNA isolation
- Up to 10 microplates can be processed in one run without user intervention
- Microplate processing time is approximately 10 min per microplate (excluding incubation times)

Introduction

Efficient isolation of high-yield gDNA is an important step in high-throughput analysis of the genome. Isolating gDNA can be accomplished by a number of approaches. Automated liquid-handling workstations can be used to isolate gDNA in a reliable, repeatable, and contamination-free manner. This application bulletin outlines a protocol for the Invitrogen ChargeSwitch EasyPlex gDNA kit using the gDNA isolation workstation in which up to 10 microplates (96-well) can be processed simultaneously.

System Description

The workstation contains an Agilent Bravo Automated Liquid Handling Platform, an Agilent BenchCel Microplate Handling Workstation, and an Agilent PlateLoc Thermal Microplate Sealer. Microplates and tipboxes are delivered to the Bravo Platform by the BenchCel Workstation. The Bravo gripper transports microplates and tipboxes around the platform. Four reservoirs containing Binding and Lysis (B+L) buffer, DNA sample solution, Wash-buffer 1 (W10), and Wash Buffer 2 (W12) are placed on the Bravo deck. A recirculating reservoir is used for liquid waste, and one deck location is dedicated for solid waste (tips, tipboxes). All tips are exchanged after each step except for the addition of the lysis buffer. After the washing steps, the microplates are sealed with the PlateLoc Sealer and stored in the BenchCel Workstation for downstream use.

Materials

Component List

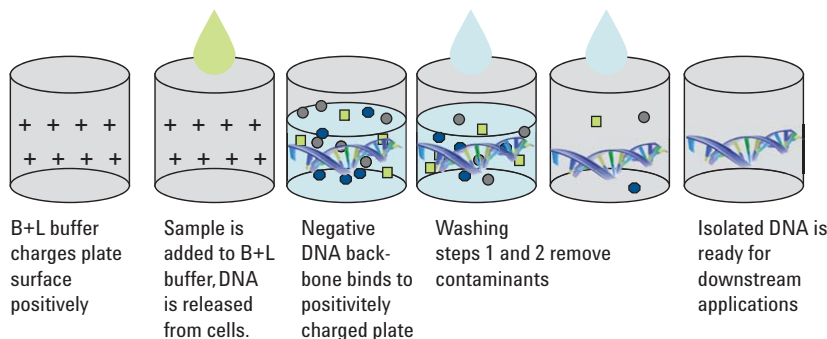
- Bravo Platform with gripper, 96LT disposable tip pipette head, 4 reservoirs, Liquid Waste Station
- PlateLoc Sealer
- BenchCel Workstation (Series R with 6 stackers)
- Agilent VWorks Automation Control software

Labware List

- Microplate A: Invitrogen EasyPlex 96-well gDNA microplates
- Tipbox A, B: Agilent Tips 96LT 200 µL

Reagent List

- Reservoir A: Binding and lysis (B+L) Buffer
- Reservoir B: DNA sample
- Reservoir C: Wash buffer W10
- Reservoir D: Wash buffer W12

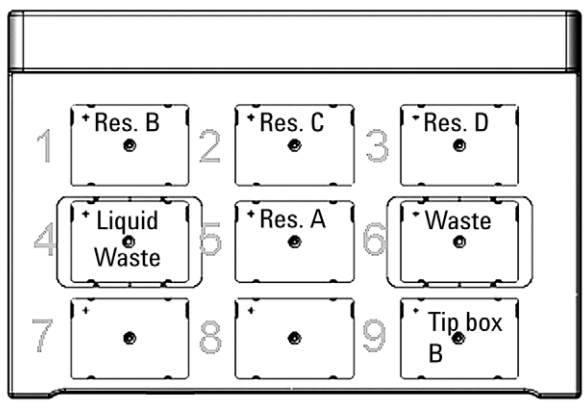


Overview of the ChargeSwitch EasyPlex gDNA Isolation process

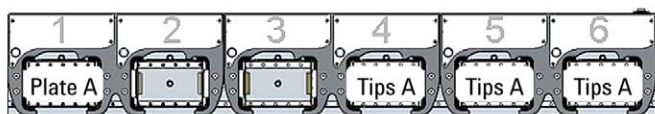


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Instrument Layout



The Agilent Bravo deck (top view) with four reagent reservoirs (locations 1-3, 5), a solid waste station (location 6), and a liquid waste station (location 4).



The Agilent BenchCel 6-stacker (top view) with microplates in stacker 1 and tipboxes in stackers 4-6 (can store up to 50 tip boxes)

Protocol Workflow

1. Move tipbox A from BenchCel stacker 4 to Bravo location 7.
2. Move tipbox A from location 7 to 8.
3. Move microplate A from BenchCel stacker 1 to Bravo location 7.
4. Press on tips at location 9.
5. Aspirate 100 μ L Lysis buffer from reservoir A and dispense into microplate A.
6. Release tips at location 9.
7. Press on tips at location 8.
8. Aspirate 10 μ L of sample from reservoir B and dispense into microplate A.
9. Mix 5 times with tips.
10. Release tips at location 8.
11. Move tipbox from location 8 to 6.
12. Move microplate A from location 7 to BenchCel stacker 2.
13. Incubate 30 min.
14. Move microplate A from BenchCel stacker 2 to location 7.
15. Move microplate A from location 7 to 8.
16. Move tipbox A from BenchCel stacker 4 to location 7.
17. Press on tips at location 7.
18. Aspirate from microplate A, and empty tips at liquid waste on location 4.
19. Release tips at location 7.
20. Move tipbox from location 8 to 6.
21. Move tipbox A from BenchCel stacker 4 to Bravo deck location 7.
22. Press on tips at location 7.
23. Aspirate 120 μ L Wash buffer from reservoir C at location 2 and dispense into microplate A at location 8.
24. Mix two times with tips.
25. Aspirate from microplate A at location 8, and empty tips to liquid waste at location 4.
26. Release tips at location 7.
27. Move tipbox from location 7 to Waste at 6.
28. Press on tips at location 7.
29. Aspirate 120 μ L Wash buffer from reservoir D at location 3 and dispense into microplate A at location 8.
30. Mix two times with tips.
31. Aspirate from microplate A, empty to liquid waste at location 4.
32. Release tips at location 7.
33. Move tipbox from location 7 to waste at 6.
34. Move microplate A from location 8 to 7.
35. Move microplate A from location 7 to PlateLoc Sealer.
36. Apply seal to microplate A.
37. Move microplate A to BenchCel stacker 3.

Conclusions

The Agilent gDNA Isolation Workstation, utilizing the Invitrogen ChargeSwitch EasyPlex kit, provides the throughput, and walk-away time necessary to keep up with the demands of genomic applications. The Agilent Bravo Automated Liquid Handling Platform has the capacity for the necessary reagents, plates, and tips in a space-saving size. The integration of three Agilent BenchCel stackers for tipboxes provides an uninterrupted supply of tips without user intervention. The Agilent PlateLoc Thermal Microplate Sealer securely seals the plate after processing, and is easily integrated into the process workflow. The estimated throughput of the outlined protocol is 10 minutes for each plate processed (depending on exact liquid handling procedures). Agilent VWorks Automation Control software uses a simple drag-and-drop method to create the event-driven protocol for the entire process. VWorks software includes error checking, error recovery, event reporting, and user-access management.

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