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Sutter Health
Sutter Roseville Medical Center

Origination: *N/A*
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Owner: *Alex Alba: Spvr, Laboratory*
Policy Area: *Lab - Hematology*
References:
Applicability: *Sutter Roseville Medical Center*

Operating the Aerospray Hematology Pro Slide Stainer and Cytocentrifuge, HC.NON04.11-/RV.XX

Purpose

This procedure describes the operation and maintenance of the model 7152 Aerospray Hematology Pro Slide Stainer and Cytocentrifuge.

Equipment

Aerospray Hematology Pro Slide Stainer and Cytocentrifuge Model 7152

Reagents

Note: All Reagents are stable after opening until the printed expiration date.

- Buffer (pH 6.8) Concentrate (SS-171A)
- Thiazin Stain (SS-071B)
- Eosin Stain (SS-071C)
- Reagent Grade Methanol (SS-MeOH)
- Aerofix Additive for methanol (SS-148)
- D.I. water

Supplies

- 5L and 500 ml reagent bottles
- Stain carousel
- Glass slides
- Nozzle Maintenance Kit
- Nozzle Cleaning solution
- Aerospray Stain Residue Solvent
- Ethanol (70% to 100%) for cleaning
- Cytopro rotor
- Cytopro single specimen chambers
- Cytopro pre-treated or untreated microscope slides

Specimen Requirements

For staining: Prepared and labeled slides of peripheral blood, bone marrow, and body fluids.

For cytocentrifugation: Appropriate body fluid. See *Manual Cell Count and Differential in Body Fluids*.

Staining

STEP	ACTION
1.	Prepare and label slides. Allow to dry completely. Note: pre-fixing the slides is not recommended.
2.	Load staining carousel: <ul style="list-style-type: none">• Place blocking slides in front of position 1 and 2, if carousel is not full.• Use a blank slide to balance the carousel if needed.• Load slides with labeled/frosted end toward the center hub.• Load slides with the specimen facing the clockwise direction.• NEVER load chipped or cracked slides. These are likely to break.
3.	Lock staining carousel lid firmly in place.
4.	Insert loaded carousel into stainer and close the instrument lid.
5.	Select the number of slides to be stained. <ul style="list-style-type: none">• The stainer will default to the full carousel setting after every run.• If you have an odd number of slides, select the next highest number displayed.• Do not include blocking slides in the number of slides to be stained.
6.	Select stain program. <ul style="list-style-type: none">• The previously used stain program will be displayed. If no changes are needed, go to step 7.• Press PROGRAMS to display available staining programs and select desired program.
7.	Press the green START arrow to begin the cycle.
8.	Use the emergency STOP button if there is abnormal vibration or noise.
9.	The display will show the progress of the program and there is a signal beep at the end of the cycle. <ul style="list-style-type: none">• Do not attempt to open lid until cycle is complete.
10.	Remove carousel from stainer, remove lid from carousel, and unload slides.

Cytocentrifugation

STEP	ACTION
1.	Label slides and load in Cytopro rotor. <ul style="list-style-type: none">• Pre-treated Cytopro slides are available for improved cell adherence.• The labeled/treated side should face the center of the rotor.• Balance rotor if less than 8 specimens are to be loaded.• NEVER load chipped or cracked slides. These are likely to break.

2.	Load specimen chamber in the rotor, load specimen into the chamber, and place caps on the chamber.
3.	Lock rotor lid firmly in place.
4.	Lower loaded rotor onto drive hub and close the lid. <ul style="list-style-type: none"> • Rotate rotor until it fits over drive hub if necessary. • Be sure that the rotor is firmly seated on the hub.
5.	Press CYTO to enter cytocentrifuge mode.
6.	Select cytocentrifuge program.
7.	Press the green START arrow to begin the cycle.
8.	Use the emergency STOP button if there is abnormal vibration or noise.
9.	The display will show the progress of the program and there is a signal beep at the end of the cycle. <ul style="list-style-type: none"> • Do not attempt to open lid until cycle is complete.
10.	Open the stainer lid and remove rotor.
11.	Transport rotor to the biological safety hood.
12.	Remove rotor lid and check for residual fluid in the chamber tunnel. <ul style="list-style-type: none"> • Repeat the cytocentrifugation process if the fluid is not completely absorbed.
13.	Remove slides from the rotor and allow to dry prior to staining.
14.	Discard specimen chamber in biohazard disposal.


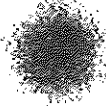
Loading Stain Reagent

STEP	ACTION															
1.	Protective equipment (lab coat, gloves, and eye protection) is required when handling reagents.															
2.	Determine reagent(s) to be replaced. <ul style="list-style-type: none"> • All the 500 mL reagent bottles have reagent level monitoring. • Monitor the display for low reagent volumes. • Visually inspect the reagent volume in the 5L reagent A container. • Do not allow reagent to run dry. Replace reagent before the bottle is completely empty. 															
3.	Prepare reagent if necessary. <table border="1" data-bbox="289 1535 1333 1927"> <thead> <tr> <th>Reagent</th> <th>Description</th> <th>Preparation</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Buffer (pH 6.8)</td> <td>Add DI water to the fill mark. Add entire bottle of concentrate (Ref# SS-171A) and mix.</td> </tr> <tr> <td>B</td> <td>Thiazin</td> <td>Ready to use.</td> </tr> <tr> <td>C</td> <td>Eosin</td> <td>Ready to use.</td> </tr> <tr> <td>D</td> <td>Methanol</td> <td>Add 15 mL of Aerofix to 500mL reagent methanol bottle and mix (if humidity is high). Use only the 500 ml reagent methanol (SS-ME OH) do not use histological grade methanol as a staining reagent.</td> </tr> </tbody> </table>	Reagent	Description	Preparation	A	Buffer (pH 6.8)	Add DI water to the fill mark. Add entire bottle of concentrate (Ref# SS-171A) and mix.	B	Thiazin	Ready to use.	C	Eosin	Ready to use.	D	Methanol	Add 15 mL of Aerofix to 500mL reagent methanol bottle and mix (if humidity is high). Use only the 500 ml reagent methanol (SS-ME OH) do not use histological grade methanol as a staining reagent.
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4. Press reagent bottle icon on right side of the main menu to enter Reagent Information menu.
 - Select desired reagent and press CHANGE.
5. Use barcode scanner or manually enter reagent information when prompted.
 - For the methanol reagent, scan the methanol bottle. Manually change the expiration data to the expiration of the Aerofix if it is shorter than the reagent methanol expiration.
6. Unscrew and remove the dip tube from the empty bottle. Place the dip tube in the new bottle and screw on cap.
 - Do not add remaining reagent from old bottle to the new bottle.
7. Place the new bottle in the tray (reagents B, C, and D.)

Daily Maintenance and QC

Daily maintenance will be performed every day of patient use. These actions may be performed additionally on any shift as needed for troubleshooting. Daily maintenance can be performed by either SLA, MLT or CLS staff. However, only CLS staff may assess the stain quality of the QC slide.

STEP	ACTION
1.	Protective equipment (lab coat, gloves, and eye protection) is required when performing maintenance.
2.	Check reagent levels and expiration dates <ul style="list-style-type: none"> • Replace reagents when near empty or expired. • Never allow reagents to run dry.
3.	<p>Perform Hub Pattern test for all reagents.</p> <ul style="list-style-type: none"> • From the Maintenance menu, press PATTERN TEST. • Hold paper towel near drive hub facing the nozzle. • Press button corresponding to the appropriate reagent. • Evaluate pattern <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p><i>Incorrect Hub Pattern Test Result</i></p>  </div> <div style="text-align: center;"> <p><i>Correct Hub Pattern Test Result</i></p>  </div> </div> <ul style="list-style-type: none"> • If pattern is not acceptable, clean nozzle with brush from the maintenance kit. Recheck hub pattern. If still not acceptable, disassemble and clean nozzle (refer to manual for instructions.) • Resolve unacceptable hub patterns before resuming sample staining. • Repeat steps until all hub pattern evaluated on all reagents. • Document result of test when prompted on analyzer by entering result and then SAVE. • Document hub pattern test completion on maintenance log. Document any corrective action on log as needed.
4.	<p>Daily Cleaning</p> <ul style="list-style-type: none"> • Load empty slide carousel and close lid. • Run carousel clean cycle.

- After automatic cleaning process is complete, spray and wipe bowl, interior lid, and nozzles with ethanol.
- Wipe down exterior of instrument with ethanol.
- Document on log.

5. Stain a peripheral blood sample as a daily QC slide.
- A slide from each stainer must be evaluated every day that the stainer is used to stain patient slides.
 - A CLS will examine the slide. The QC slide is acceptable if cells are adhered to slide, staining is even and free of significant artifacts and precipitate, and cytoplasmic and nuclear staining is normal.
 - Resolve unacceptable staining before resuming sample staining.
 - Document QC and any corrective action on log.

Weekly Maintenance

STEP	ACTION						
1.	Protective equipment (lab coat, gloves, and eye protection) is required when performing maintenance.						
2.	Perform Hub Pattern test for all 4 reagents (see daily maintenance section.)						
3.	<p>Perform Volume test for all 4 reagents.</p> <ul style="list-style-type: none"> • From the Maintenance menu, press VOLUME TEST. • Hold a volume test tube to the nozzle. • Press button corresponding to the appropriate reagent. • Record volume when prompted on analyzer and on log. • Repeat steps until volume test is completed for all reagents. • Document result of test when prompted on analyzer by entering volume and then SAVE. • Document volumes on maintenance log. Document any corrective action on log as needed. • Nozzle volumes that are slightly lower or high than the expected range may be acceptable if : <ul style="list-style-type: none"> ◦ the nozzle B and C volumes are within in 1 ml or each other and ◦ QC slides are acceptable • Spray volumes <7.5 mL or >13.0 mL are not acceptable. Resolve problem before resuming sample staining. • Volume Test Expected Volumes <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Nozzle/Reagent Line</th> <th>Volume Range (mL)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>9-11</td> </tr> <tr> <td>B,C,D</td> <td>9.5-12</td> </tr> </tbody> </table>	Nozzle/Reagent Line	Volume Range (mL)	A	9-11	B,C,D	9.5-12
Nozzle/Reagent Line	Volume Range (mL)						
A	9-11						
B,C,D	9.5-12						
4.	Wipe down nozzles, carousel tray, and carousel lid with ethanol						
5.	<p>Flush drain line with 200-300 mL ethanol. Verify that the drain is flowing properly.</p> <ul style="list-style-type: none"> • Document on log. 						

Monthly Maintenance

STEP	ACTION
1.	Protective equipment (lab coat, gloves, and eye protection) is required when performing maintenance.
2.	Disassemble and manually clean both nozzles with stain residue solvent (SS-230). Reinstall nozzles after cleaning. <ul style="list-style-type: none">• Refer to manual for instructions.• Return nozzles to the same location in the stainer.• Do not mix or interchange nozzle parts.• Hub Pattern and Volume test must be done following nozzle maintenance.
3.	Perform Hub Pattern test (see daily maintenance section.)
4.	Perform Volume test (see weekly maintenance section.)
5.	Disinfect reusable Reagent A bottle. <ul style="list-style-type: none">• Use a 1:10 dilution of bleach.• Let sit for 10 minutes.• Rinse thoroughly with DI water.• Document on log.

As Needed Maintenance

Refer to user manual for other maintenance procedures to be performed as needed for troubleshooting. Document as needed maintenance procedures on log.

Troubleshooting

Refer to the user manual for information on general troubleshooting and on resolving abnormal staining results, instrument malfunctions, and system errors.

ELITech Group technical services may be contacted at 1-800-453-2725 for support as needed.

References

- Aerospray Hematology Pro Model 7152 Slide Stainer/Cytocentrifuge Application Manual
- Cytopro Cytocentrifuge Rotor AC-160 Applications Manual
- Cytopro Cytocentrifuge Methods Manual

All revision dates:

Attachments:

Aerospray maintenance log.xls

Approval Signatures

Step Description	Approver	Date
Medical Director	Lindsey Westerbeck: Dir, Lab	pending
Laboratory Director	Lindsey Westerbeck: Dir, Lab	10/29/2019

Aerospray Stainer Maintenance Log

Stainer: SN 7152191267

Month/Year

Daily Maintenance		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
Check Reagents																																		
Perform Hub Pattern test																																		
Dayshift Clean (carousel and surfaces)																																		
PM shift Clean (carousel and surfaces)																																		
Tech code																																		
Daily Quality Control																																		
Slide QC review (CLS only)																																		
Tech code																																		
Weekly Maintenance																																		
<ul style="list-style-type: none"> Clean carousel and surfaces with ethanol Flush drain line with ethanol Perform Volume Test Perform Hub Pattern test Clean nozzles with stain residue solvent if Hub pattern and/or volume test not acceptable 																																		
Tech code																																		
Monthly Maintenance																																		
<ul style="list-style-type: none"> Disassemble and clean nozzles with stain residue solvent Perform Hub Pattern test Perform Volume Test Disinfect Reagent A bottle 																																		
Tech code																																		
Volume Check																																		
Nozzle (Acceptable range)																																		
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D (9.5-12 mL)																																		
Acceptable (Y/N)?																																		
Tech Code																																		
As Needed Tasks (List Task with Date and Tech Code)																																		

List any corrective actions on back of log. NOTE: Blank spaces = Not applicable
Document # HC.NON04.11-F:A-RV.01

Reviewed by / Date: _____