Drucker Diagnostics

Pre-Analytic Sample Processing
Stout C, et al., 2015

WHITE PAPER

DRUCKER MODEL 842

With BD Vacutainer™ PST Lithium Heparin Tube

To validate that the Drucker 842 horizontal centrifuge provides STAT gel formation and platelet poor plasma of less than 10 x 10^3 platelets / uL in three (3) minutes when processing BD Vacutainer™ PST Lithium Heparin Tubes at 5,000 xg.

BACKGROUND

CLSI document GP44-A4 recommends following the tube manufacturer's instructions-for-use (I.F.U.), but also states that, *"advancements in technology may provide for adequate specimen preparation at different speeds and times of centrifugation." Additionally, the BD tube I.F.U. states, "Use of alternate centrifugation conditions (e.g., higher RCF and shorter spin time) may also provide acceptable performance; this should be evaluated and validated by the laboratory."*

The following study validates the centrifuge and tube functionality by achieving a packed and consistent gel layer and platelet counts under 10 x 10^3 platelets / uL in three (3) minutes.

METHODS

Thirty-two (32) blood specimen were collected with BD Vacutainer™ PST Lithium Heparin chemistry tubes and centrifuged using the Drucker Model 842 horizontal centrifuge set with the following settings:

RPM: 6,500
RCF: 5,000 xg
Time: 3 minutes
Braking: 4

The blood specimen were centrifuged one complete cycle and removed from the centrifuge within 2 minutes of the completion of the cycle. The thirty-two (32) blood specimen were analyzed for platelet count in random order after removal from the centrifuge. The platelet analyzer used was a standard Sysmex POCH 100i hematology analyzer.

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RESULTS

After collecting and centrifuging thirty-two (32) Vacutainer™ 3 mL green top tubes, each tube was inspected for proper separation and presence of hemolysis. In all cases, the gel layer had formed properly between the packed RBC's and plasma and no hemolysis or other specimen issues were noted.

All tubes were tested for Platelet count using a POCH 100i hematology analyzer.

- The Average platelet count for the first 18 samples was 0.11 x 10^3 plt / uL
- The Average platelet count for the second 14 samples was 0.50 x 10^3 plt / uL
- The Average platelet count for all 32 samples was 0.31 x 10^3 plt / uL
- One (1) outlier was noted with platelet counts less than 10 but higher than expected; this outlier platelet count was 7 x 10^3 plt / uL

CONCLUSIONS

It is the professional opinion of the laboratory manager that the Drucker 842 centrifuge with horizontal rotor and the listed settings is well suited to supply STAT platelet-poor-plasma with BD PST Lithium Heparin tubes in three (3) minutes. Due to the very low platelet counts achieved while using three (3) minutes, it is feasible that a two (2) minute centrifugation time would also yield acceptable gel layer formation as well as platelet poor plasma to be used for chemistry analysis. An additional study validating a two (2) minute run time is recommended.

The test data can be found in Addendum A. The test protocol was executed under the supervision of Beth Bubb, (MT) ASCP

TEST LOCATION

Drucker Diagnostics Laboratory
200 Shadylane Drive
Philipsburg, PA 16866

EQUIPMENT

Centrifuge Model: Drucker Model 842
Rotor: 6-Place Horizontal, Performance Plus
Test Tubes: BD Vacutainer™ 13mm x 75; Lithium Heparin PST (Green Tops)
Analyzer: POCH 100i S/N: A4263

CENTRIFUGE SETTINGS

Speed: 6,500 RPM
G-Force: 5,000 xg
Run Time: 3 minutes
Braking: 4

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ADDENDUM A

TEST DATA: NOVEMBER 10

SPECIMEN #	PLATELETS x 10^3 / uL
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	2
15	0
16	0
17	0
18	0
Average	**0.11 x 10^3 plt/uL**

TEST DATA: NOVEMBER 13

SPECIMEN #	PLATELETS x 10^3 / uL
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	7
28	0
29	0
30	0
31	0
32	0
Average	**0.50 x 10^3 plt/uL**

COMBINED AVERAGE: 0.31 x 10^3 plt/uL