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**Wadsworth Center**

**New York State Department of Health**

**ERYTHROCYTE PROTOPORPHYRIN**

**Proficiency Test Report**

**Event #3, 2003**

**November 26, 2003**

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Antonia C. Novello, M.D., M.P.H.  
*Commissioner*

Dennis P. Whalen  
*Executive Deputy Commissioner*

November 26, 2003

**TOXICOLOGY - ERYTHROCYTE PROTOPORPHYRIN**  
**Event #3, 2003**

Dear Laboratory Director:

Results of the third proficiency test (PT) event for Erythrocyte Protoporphyrin (EP) have been evaluated and graded. The test materials were prepared from whole goat blood. Five animals were dosed with lead acetate prior to the test to generate elevated EP levels. On September 30th, 2003, 400-mL of blood were drawn from each animal into separate plastic blood bags containing 750 mg K<sub>2</sub>EDTA. Each animal yielded a separate blood pool with EP levels ranging from 18 µg/dL to 209 µg/dL. Aliquots of whole blood were transferred into additive-free evacuated glass tubes and shipped to extraction participants on October 1st, 2003. The remaining blood was prepared for hematofluorometer (HF) participants with EP levels ranging from 25 µg/dL to 260 µg/dL. To eliminate fluorescent artifacts, erythrocytes were separated from plasma, washed with normal saline and resuspended in a citrate-glycerol solution. Aliquots of the blood-product were transferred to additive-free evacuated glass tubes and shipped to all HF participants on October 15th, 2003.

Each laboratory will receive an individual performance summary for the last three PT test events under separate cover. To pass the PT for EP, a laboratory must achieve a minimum score of 80% (4 out of 5 correct) on two consecutive testing events, or two out of three consecutive testing events.

**EXTRACTION METHOD**

Target values are calculated using results from all participants (excluding outliers). **The next PT event for the extraction method is scheduled to be shipped March 3rd, 2004.** Contact Wadsworth laboratory staff at (518) 473-0452 if the PT materials have not arrived within five days of the scheduled mailout date.

**HEMATOFLUOROMETRY**

Target values for AVIV instruments are calculated using results from all participants (excluding outliers) and are reported as µg/dL, assumed hct 35. Target values for Helena Protofluor-Z instruments are calculated using results from all participants (excluding outliers) and reported as µmol ZPP/mol heme. **The next PT event for the hematofluorometer method is scheduled to be shipped March 17th, 2004.** Contact Wadsworth laboratory staff at (518) 473-0452 if the PT materials have not arrived within five days of the scheduled mailout date.

Thank you for your participation.

Sincerely,

Patrick J. Parsons, Ph.D.  
Section Head, Erythrocyte Protoporphyrin Proficiency Testing Program

**New York State Department of Health**  
**Erythrocyte Protoporphyrin - Extraction Test Results, 2003 Event # 3**  
**PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		EP03-11	EP03-12	EP03-13	EP03-14	EP03-15		
Target Values:		39	74	209	18	154		
103	EtOAc Extr.	45	82	226	20	164	1.10	
108	EtOAc Extr.	39	72	207	17	153	0.98	
109	EtOAc Extr.	38	69	182	14	140	0.89	
110	EtOAc Extr.	40	76	230	17	160	1.03	
168	EtOAc Extr.	40	76	223	22	156	1.07	
174	EtOAc Extr.	38	75	205	18	152	0.99	
179	EtOAc Extr.	37	74	209	18	161	1.00	
198	EtOAc Extr.	40	77	223	16	156	1.01	
206	EtOAc Extr.	37	71	191	17	155	0.95	
237	EtOAc Extr.	35	67	189	18	140	0.92	
254	EtOAc Extr.	32 ↓	62 ↓	167 ↓	14	127 ↓	0.81	

Percent satisfactory results for all participants: 92.7 %

**notes:** ↑ reported value outside upper limit  
↓ reported value outside lower limit

Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.  
Info only: results included for informational purposes only.

**New York State Department of Health**  
**Erythrocyte Protoporphyrin - Hematofluorometer Test Results, 2003 Event #3**  
**PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		HF03-11	HF03-12	HF03-13	HF03-14	HF03-15		
Target Values:		250	260	25	51	105		
104	Aviv Hemat.	265	277	34 ↑	62 ↑	120	1.17	Info
106	Aviv Hemat.	261	269	27	54	110	1.05	
108	Aviv Hemat.	231	214 ↓	19	48	90	0.86	Info
109	Aviv Hemat.	288	304 ↑	25	56	120	1.11	Info
110	Aviv Hemat.	236	249	22	46	101	0.93	
112	Aviv Hemat.	232	248	22	46	96	0.92	
114	Aviv Hemat.	252	270	29	55	109	1.06	
123	Aviv Hemat.	241	250	25	50	102	0.98	
126	Aviv Hemat.	260	280	28	54	108	1.06	
131	Aviv Hemat.	248	263	28	51	105	1.02	
132	Aviv Hemat.	238	232	24	48	96	0.93	
147	Aviv Hemat.	215	228	23	48	102	0.91	
155	Aviv Hemat.	248	249	27	49	108	1.00	
156	Aviv Hemat.	270	280	29	56	110	1.09	
158	Aviv Hemat.	250	268	27	52	107	1.03	
159	Aviv Hemat.	255	266	21	49	101	0.96	
160	Aviv Hemat.	269	247	25	52	103	1.01	
164	Aviv Hemat.	244	264	18 ↓	36 ↓	99	0.87	
197	Aviv Hemat.	288	301 ↑	25	49	111	1.07	
199	Aviv Hemat.	272	286	26	53	112	1.07	
221	Aviv Hemat.	258	264	22	47	106	0.97	
251	Aviv Hemat.	261	280	27	52	110	1.05	
272	Aviv Hemat.	255	263	23	51	110	1.00	
305	Aviv Hemat.	244	251	26	50	101	0.98	
333	Aviv Hemat.	255	276	22	51	105	0.99	
347	Aviv Hemat.	234	250	26	49	97	0.96	
348	Aviv Hemat.	281	295	30	60 ↑	118	1.15	

Percent satisfactory results for all participants: 94.1 %

**notes:** ↑ reported value outside upper limit  
↓ reported value outside lower limit

Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.  
Info only: results included for informational purposes only.

**New York State Department of Health**  
**Erythrocyte Protoporphyrin - Hematofluorometer (ZPP) Test Results, 2003 Event # 3**  
**PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ( $\mu\text{mol ZPP/mol heme}$ )					Normalized Mean	Info Only
		HF03-11	HF03-12	HF03-13	HF03-14	HF03-15		
Target Values:		300	330	36	69	131		
109	Helena Hemat.	294	315	33	59	120	0.92	
110	Helena Hemat.	274	307	35	66	124	0.94	
201	Helena Hemat.	335	358	38	75	138	1.08	
204	Helena Hemat.	288	346	38	63	134	1.00	
206	Helena Hemat.	286	312	31	62	125	0.92	
290	Helena Hemat.	>300	>300	34	71	136	1.00	
340	Helena Hemat.	300	319	40	74	136	1.04	
371	Helena Hemat.	325	352	37	79	134	1.07	

Percent satisfactory results for all participants: 100.0 %

**notes:** ↑ reported value outside upper limit  
↓ reported value outside lower limit

Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.  
Info only: results included for informational purposes only.

**New York State Department of Health  
Erythrocyte Protoporphyrin - Extraction Test Results, 2003 Event # 3  
STATISTICAL SUMMARY**

**TARGET VALUE ASSIGNMENT AND STATISTICS**

Lab Code	Method	Results (µg/dL whole blood)				
		EP03-11	EP03-12	EP03-13	EP03-14	EP03-15
103	EtOAc Extr.	45	82	226	20	164
108	EtOAc Extr.	39	72	207	17	153
109	EtOAc Extr.	38	69	182	14	140
110	EtOAc Extr.	40	76	230	17	160
168	EtOAc Extr.	40	76	223	22	156
174	EtOAc Extr.	38	75	205	18	152
179	EtOAc Extr.	37	74	209	18	161
198	EtOAc Extr.	40	77	223	16	156
206	EtOAc Extr.	37	71	191	17	155
237	EtOAc Extr.	35	67	189	18	140
Number of Sample Measurements:		10	10	10	10	10
<b>Mean (target value):</b>		<b>39</b>	<b>74</b>	<b>209</b>	<b>18</b>	<b>154</b>
Standard Deviation:		2.7	4.3	17.0	2.2	8.1
RSD (%):		6.9	5.9	8.1	12.2	5.3
Acceptable Range:						
Upper Limit:		45	85	240	24	177
Lower Limit:		33	63	178	12	131

**notes:** Results reported as less than the detection limits are treated as zero for statistical and grading purposes.

**New York State Department of Health**  
**Erythrocyte Protoporphyrin - Hematofluorometer Test Results, 2003 Event #3**  
**STATISTICAL SUMMARY**

**TARGET VALUE ASSIGNMENT AND STATISTICS**

Lab Code	Method	Results (µg/dL whole blood)				
		HF03-11	HF03-12	HF03-13	HF03-14	HF03-15
106	Aviv Hemat.	261	269	27	54	110
110	Aviv Hemat.	236	249	22	46	101
112	Aviv Hemat.	232	248	22	46	96
114	Aviv Hemat.	252	270	29	55	109
123	Aviv Hemat.	241	250	25	50	102
126	Aviv Hemat.	260	280	28	54	108
131	Aviv Hemat.	248	263	28	51	105
132	Aviv Hemat.	238	232	24	48	96
147	Aviv Hemat.	215	228	23	48	102
155	Aviv Hemat.	248	249	27	49	108
156	Aviv Hemat.	270	280	29	56	110
158	Aviv Hemat.	250	268	27	52	107
159	Aviv Hemat.	255	266	21	49	101
160	Aviv Hemat.	269	247	25	52	103
199	Aviv Hemat.	272	286	26	53	112
221	Aviv Hemat.	258	264	22	47	106
251	Aviv Hemat.	261	280	27	52	110
272	Aviv Hemat.	255	263	23	51	110
305	Aviv Hemat.	244	251	26	50	101
333	Aviv Hemat.	255	276	22	51	105
347	Aviv Hemat.	234	250	26	49	97
Number of Sample Measurements:		21	21	21	21	21
<b>Mean (target value):</b>		<b>250</b>	<b>260</b>	<b>25</b>	<b>51</b>	<b>105</b>
Standard Deviation:		14.1	15.9	2.5	2.8	4.9
RSD (%):		5.7	6.1	10.1	5.6	4.7
Acceptable Range:						
Upper Limit:		288	299	31	59	121
Lower Limit:		213	221	19	43	89

**notes:** Results reported as less than the detection limits are treated as zero for statistical and grading purposes.

**New York State Department of Health**  
**Erythrocyte Protoporphyrin - Hematofluorometer (ZPP) Test Results, 2003 Event # 3**  
**STATISTICAL SUMMARY**

**TARGET VALUE ASSIGNMENT AND STATISTICS**

Lab Code	Method	Results ( $\mu\text{mol ZPP/mol heme}$ )				
		HF03-11	HF03-12	HF03-13	HF03-14	HF03-15
109	Helena Hemat.	294	315	33	59	120
110	Helena Hemat.	274	307	35	66	124
201	Helena Hemat.	335	358	38	75	138
204	Helena Hemat.	288	346	38	63	134
206	Helena Hemat.	286	312	31	62	125
290	Helena Hemat.	>300	>300	34	71	136
340	Helena Hemat.	300	319	40	74	136
371	Helena Hemat.	325	352	37	79	134
Number of Sample Measurements:		7	7	8	8	8
<b>Mean (target value):</b>		<b>300</b>	<b>330</b>	<b>36</b>	<b>69</b>	<b>131</b>
Standard Deviation:		22.0	21.3	3.0	7.2	6.8
RSD (%):		7.3	6.5	8.4	10.4	5.2
Acceptable Range:						
Upper Limit:		345	380	42	79	151
Lower Limit:		255	281	30	59	111

**notes:** Results reported as less than the detection limits are treated as zero for statistical and grading purposes.

**New York State Department of Health**  
**Erythrocyte Protoporphyrin - Extraction Test Results, 2003 Event # 3**  
**STATISTICAL SUMMARY BY CLASS**

	Results ( $\mu\text{g/dL}$ whole blood)				
	EP03-11	EP03-12	EP03-13	EP03-14	EP03-15
<b>Evaluated</b>					
Number of Sample Measurements:	1	1	1	1	1
Mean:	32.0	62.0	167.0	14.0	127.0
Standard Deviation:	?	?	?	?	?
RSD (%):	—	—	—	—	—
<b>Reference</b>					
Number of Sample Measurements:	10	10	10	10	10
Mean:	38.9	73.9	208.5	17.7	153.7
Standard Deviation:	2.7	4.3	17.0	2.2	8.1
RSD (%):	6.9	5.9	8.1	12.2	5.3
<b>All Laboratories</b>					
Number of Sample Measurements:	11	11	11	11	11
Mean:	38.3	72.8	204.7	17.4	151.3
Standard Deviation:	3.3	5.5	20.4	2.3	11.1
RSD (%):	8.6	7.5	10.0	13.5	7.4

**notes:** ? Insufficient data for SD calculation.

**New York State Department of Health**  
**Erythrocyte Protoporphyrin - Hematofluorometer Test Results, 2003 Event #3**  
**STATISTICAL SUMMARY BY CLASS**

	Results ( $\mu\text{g/dL}$ whole blood)				
	HF03-11	HF03-12	HF03-13	HF03-14	HF03-15
<b>Evaluated</b>					
Number of Sample Measurements:	3	3	3	3	3
Mean:	271.0	286.7	24.3	48.3	109.3
Standard Deviation:	23.6	19.9	6.0	12.0	9.6
RSD (%):	—	—	—	—	—
<b>Info</b>					
Number of Sample Measurements:	3	3	3	3	3
Mean:	261.3	265.0	26.0	55.3	110.0
Standard Deviation:	28.7	46.2	7.5	7.0	17.3
RSD (%):	—	—	—	—	—
<b>Reference</b>					
Number of Sample Measurements:	21	21	21	21	21
Mean:	250.2	260.4	25.2	50.6	104.7
Standard Deviation:	14.1	15.9	2.5	2.8	4.9
RSD (%):	5.7	6.1	10.1	5.6	4.7
<b>All Laboratories</b>					
Number of Sample Measurements:	27	27	27	27	27
Mean:	253.7	263.9	25.2	50.9	105.8
Standard Deviation:	17.6	21.4	3.5	4.9	7.3
RSD (%):	7.0	8.1	13.9	9.7	6.9

**notes:** ? Insufficient data for SD calculation.