
Wadsworth Center

New York State Department of Health

ERYTHROCYTE PROTOPORPHYRIN

Proficiency Test Report

Event #1, 2006

April 10, 2006



STATE OF NEW YORK DEPARTMENT OF HEALTH

Wadsworth Center The Governor Nelson A. Rockefeller Empire State Plaza P.O. Box 509 Albany, New York 12201-0509

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

Dennis P. Whalen
Executive Deputy Commissioner

April 10, 2006

TOXICOLOGY - ERYTHROCYTE PROTOPORPHYRIN Event #1, 2006

Dear Laboratory Director:

Results of the first 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 February 14th, 2006, 400-mL of blood were drawn from each animal into separate plastic blood bags containing 750 mg K₂EDTA. Each animal yielded a separate blood pool with EP levels ranging from 42 µg/dL to 148 µg/dL. Aliquots of whole blood were transferred into additive-free evacuated glass tubes and shipped to extraction participants on February 15th, 2006. The remaining blood was prepared for hematofluorometer (HF) participants with EP levels ranging from 40 µg/dL to 181 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 March 1st, 2006.

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 May 24th, 2006.** Contact Wadsworth laboratory staff at (518) 474-4484 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 June 7th, 2006.** Contact Wadsworth laboratory staff at (518) 474-4484 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, 2006 Event # 1
PERFORMANCE OF PARTICIPATING LABORATORIES**

Lab Code	Method	Results ($\mu\text{g/dL}$ whole blood)					Normalized Mean	Info Only
		EP06-01	EP06-02	EP06-03	EP06-04	EP06-05		
Target Values:		105	120	148	71	42		
103	EtOAc	108	127	154	74	43	1.04	
108	EtOAc	100	112	135	65	40	0.93	
109	EtOAc	116	128	160	73	45	1.07	
110	EtOAc	113	124	150	73	45	1.04	
168	EtOAc	101	124	151	74	43	1.02	
174	EtOAc	91	103	129	56 ↓	35 ↓	0.84	
179	EtOAc	90	107	142	68	37	0.91	
206	EtOAc	105	120	147	69	41	0.99	

Percent satisfactory results for all participants: 95.0 %

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, 2006 Event # 1
STATISTICAL SUMMARY**

TARGET VALUE ASSIGNMENT AND STATISTICS

Lab Code	Method	Results ($\mu\text{g/dL}$ whole blood)				
		EP06-01	EP06-02	EP06-03	EP06-04	EP06-05
103	EtOAc	108	127	154	74	43
108	EtOAc	100	112	135	65	40
109	EtOAc	116	128	160	73	45
110	EtOAc	113	124	150	73	45
168	EtOAc	101	124	151	74	43
179	EtOAc	90	107	142	68	37
206	EtOAc	105	120	147	69	41
Number of Sample Measurements:		7	7	7	7	7
Mean (target value):		105	120	148	71	42
Standard Deviation:		8.8	7.9	8.1	3.5	2.9
RSD (%):		8.4	6.6	5.5	5.0	6.9
Acceptable Range:						
Upper Limit:		121	138	170	82	48
Lower Limit:		89	102	126	60	36

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, 2006 Event # 1
STATISTICAL SUMMARY BY CLASS

	Results ($\mu\text{g/dL}$ whole blood)				
	EP06-01	EP06-02	EP06-03	EP06-04	EP06-05
Evaluated					
Number of Sample Measurements:	1	1	1	1	1
Mean:	91.0	103.0	129.0	56.0	35.0
Standard Deviation:	?	?	?	?	?
RSD (%):	—	—	—	—	—
Reference					
Number of Sample Measurements:	7	7	7	7	7
Mean:	104.7	120.3	148.4	70.9	42.0
Standard Deviation:	8.8	7.9	8.1	3.5	2.9
RSD (%):	8.4	6.6	5.5	5.0	6.9
All Laboratories					
Number of Sample Measurements:	8	8	8	8	8
Mean:	103.0	118.1	146.0	69.0	41.1
Standard Deviation:	9.4	9.6	10.2	6.2	3.6
RSD (%):	9.2	8.1	7.0	9.0	8.9

notes: ? Insufficient data for SD calculation.

New York State Department of Health
Erythrocyte Protoporphyrin - Hematofluorometer Test Results, 2006 Event #1
PERFORMANCE OF PARTICIPATING LABORATORIES

Lab Code	Method	Results (µg/dL whole blood)					Normalized Mean	Info Only
		HF06-01	HF06-02	HF06-03	HF06-04	HF06-05		
Target Values:		40	139	181	156	76		
104	Aviv Hematofluorometry	39	140	>141	>141	74	0.99	Info
106	Aviv Hematofluorometry	42	140	180	154	78	1.01	
109	Aviv Hematofluorometry	38	142	184	160	75	1.00	
110	Aviv Hematofluorometry	41	134	178	150	75	0.98	
112	Aviv Hematofluorometry	42	151	200	171	80	1.08	
114	Aviv Hematofluorometry	41	141	176	153	76	1.00	
123	Aviv Hematofluorometry	40	141	185	156	73	1.00	
126	Aviv Hematofluorometry	48 ↑	156	194	172	85	1.12	
131	Aviv Hematofluorometry	41	138	173	150	77	0.99	
147	Aviv Hematofluorometry	34	124	166	136	68	0.89	
155	Aviv Hematofluorometry	42	148	173	161	174 ↑	1.28	Info
156	Aviv Hematofluorometry	42	149	191	165	78	1.05	
158	Aviv Hematofluorometry	40	138	182	160	80	1.02	
160	Aviv Hematofluorometry	44	153	199	168	85	1.10	
164	Aviv Hematofluorometry	41	149	192	167	80	1.06	
197	Aviv Hematofluorometry	40	144	188	165	77	1.03	
199	Aviv Hematofluorometry	43	146	188	164	80	1.05	
221	Aviv Hematofluorometry	38	134	178	152	72	0.96	
251	Aviv Hematofluorometry	42	123	160	146	72	0.94	
272	Aviv Hematofluorometry	39	146	187	167	77	1.03	
293	Aviv Hematofluorometry	29 ↓	116 ↓	151 ↓	124 ↓	61 ↓	0.80	Info
305	Aviv Hematofluorometry	43	137	174	151	75	1.00	
333	Aviv Hematofluorometry	40	126	174	146	75	0.96	
347	Aviv Hematofluorometry	4 ↓	168 ↑	250 ↑	212 ↑	77	1.24	Info
348	Aviv Hematofluorometry	38	136	175	150	75	0.97	
377	Aviv Hematofluorometry	36	130	169	146	69	0.92	

Percent satisfactory results for all participants: 91.5 %

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, 2006 Event #1
STATISTICAL SUMMARY

TARGET VALUE ASSIGNMENT AND STATISTICS

Lab Code	Method	Results ($\mu\text{g/dL}$ whole blood)				
		HF06-01	HF06-02	HF06-03	HF06-04	HF06-05
106	Aviv Hematofluorometry	42	140	180	154	78
109	Aviv Hematofluorometry	38	142	184	160	75
110	Aviv Hematofluorometry	41	134	178	150	75
112	Aviv Hematofluorometry	42	151	200	171	80
114	Aviv Hematofluorometry	41	141	176	153	76
123	Aviv Hematofluorometry	40	141	185	156	73
131	Aviv Hematofluorometry	41	138	173	150	77
147	Aviv Hematofluorometry	34	124	166	136	68
156	Aviv Hematofluorometry	42	149	191	165	78
158	Aviv Hematofluorometry	40	138	182	160	80
160	Aviv Hematofluorometry	44	153	199	168	85
164	Aviv Hematofluorometry	41	149	192	167	80
197	Aviv Hematofluorometry	40	144	188	165	77
199	Aviv Hematofluorometry	43	146	188	164	80
221	Aviv Hematofluorometry	38	134	178	152	72
251	Aviv Hematofluorometry	42	123	160	146	72
272	Aviv Hematofluorometry	39	146	187	167	77
305	Aviv Hematofluorometry	43	137	174	151	75
333	Aviv Hematofluorometry	40	126	174	146	75
348	Aviv Hematofluorometry	38	136	175	150	75
377	Aviv Hematofluorometry	36	130	169	146	69
Number of Sample Measurements:		21	21	21	21	21
Mean (target value):		40	139	181	156	76
Standard Deviation:		2.4	8.6	10.3	9.3	4.0
RSD (%):		6.0	6.2	5.7	6.0	5.2
Acceptable Range:						
Upper Limit:		46	160	208	179	87
Lower Limit:		34	118	154	133	65

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, 2006 Event #1
STATISTICAL SUMMARY BY CLASS

	Results ($\mu\text{g/dL}$ whole blood)				
	HF06-01	HF06-02	HF06-03	HF06-04	HF06-05
Evaluated					
Number of Sample Measurements:	1	1	1	1	1
Mean:	48.0	156.0	194.0	172.0	85.0
Standard Deviation:	?	?	?	?	?
RSD (%):	—	—	—	—	—
Info					
Number of Sample Measurements:	3	4	3	3	3
Mean:	36.7	143.0	191.3	165.7	70.7
Standard Deviation:	6.8	21.5	52.0	44.2	8.5
RSD (%):	—	15.0	—	—	—
Reference					
Number of Sample Measurements:	21	21	21	21	21
Mean:	40.2	139.1	180.9	156.0	76.0
Standard Deviation:	2.4	8.6	10.3	9.3	4.0
RSD (%):	6.0	6.2	5.7	6.0	5.2
All Laboratories					
Number of Sample Measurements:	25	26	25	25	25
Mean:	40.1	140.4	182.7	157.8	75.8
Standard Deviation:	3.6	11.3	18.2	15.9	5.1
RSD (%):	8.9	8.0	10.0	10.1	6.7

notes: ? Insufficient data for SD calculation.

New York State Department of Health
Erythrocyte Protoporphyrin - Hematofluorometer (ZPP) Test Results, 2006 Event # 1
PERFORMANCE OF PARTICIPATING LABORATORIES

Lab Code	Method	Results ($\mu\text{mol ZPP/mol heme}$)					Normalized Mean	Info Only
		HF06-01	HF06-02	HF06-03	HF06-04	HF06-05		
Target Values:		47	141	182	155	83		
109	Helena ZPP	46	140	182	154	80	0.99	
110	Helena ZPP	48	138	185	152	84	1.00	
201	Helena ZPP	48	139	182	158	81	1.00	
204	Helena ZPP	45	140	175	156	86	0.99	
206	Helena ZPP	47	140	181	152	82	0.99	
208	Helena ZPP	37 ↓	128	168	142	76	0.89	
290	Helena ZPP	51	150	192	164	84	1.05	
340	Helena ZPP	57 ↑	146	185	158	91	1.08	
401	Helena ZPP	47	137	174	150	81	0.97	

Percent satisfactory results for all participants: 95.6 %

notes: ↑ reported value outside upper limit Normalized mean: The average of each reported result divided by the corresponding target value. It measures bias.
↓ reported value outside lower limit Info only: results included for informational purposes only.

New York State Department of Health
Erythrocyte Protoporphyrin - Hematofluorometer (ZPP) Test Results, 2006 Event # 1
STATISTICAL SUMMARY

TARGET VALUE ASSIGNMENT AND STATISTICS

Lab Code	Method	Results ($\mu\text{mol ZPP/mol heme}$)				
		HF06-01	HF06-02	HF06-03	HF06-04	HF06-05
109	Helena ZPP	46	140	182	154	80
110	Helena ZPP	48	138	185	152	84
201	Helena ZPP	48	139	182	158	81
204	Helena ZPP	45	140	175	156	86
206	Helena ZPP	47	140	181	152	82
290	Helena ZPP	51	150	192	164	84
401	Helena ZPP	47	137	174	150	81
Number of Sample Measurements:		7	7	7	7	7
Mean (target value):		47	141	182	155	83
Standard Deviation:		1.9	4.3	6.1	4.7	2.1
RSD (%):		4.0	3.1	3.3	3.1	2.6
Acceptable Range:						
Upper Limit:		54	162	209	178	95
Lower Limit:		40	120	155	132	71

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, 2006 Event # 1
STATISTICAL SUMMARY BY CLASS

	Results ($\mu\text{mol ZPP/mol heme}$)				
	HF06-01	HF06-02	HF06-03	HF06-04	HF06-05
Evaluated					
Number of Sample Measurements:	2	2	2	2	2
Mean:	47.0	137.0	176.5	150.0	83.5
Standard Deviation:	14.1	12.7	12.0	11.3	10.6
RSD (%):	—	—	—	—	—
Reference					
Number of Sample Measurements:	7	7	7	7	7
Mean:	47.4	140.6	181.6	155.1	82.6
Standard Deviation:	1.9	4.3	6.1	4.7	2.1
RSD (%):	4.0	3.1	3.3	3.1	2.6
All Laboratories					
Number of Sample Measurements:	9	9	9	9	9
Mean:	47.3	139.8	180.4	154.0	82.8
Standard Deviation:	5.3	6.1	7.1	6.2	4.2
RSD (%):	11.1	4.3	3.9	4.0	5.1

notes: ? Insufficient data for SD calculation.