Centre Universitaire Romand de Médecine Légale

Dr. Frank Sporkert

To all
Participants

Lausanne, February 28, 2011

Inter-laboratory proficiency test: ethyl glucuronide in hair
Examination period: 16 December 2010 – 16 January 2011

Your Laboratory code:

Dear participant,

Please find attached the report including the results from your laboratory obtained in the context of the proficiency test conducted during the 2-month examination period mentioned above.

Best regards

Frank Sporkert

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Participants:

Participating laboratories: 25
Laboratories having reported their results: 21
Number of samples to be analyzed: 2 (powdered hair samples A & B)

Applied techniques:

GC-MS-NCI: 3 labs
GC-MS/MS-EI: 2 labs
GC-MS/MS-NCI: 4 labs
LC-MS/MS: 12 labs
SPE: 15 labs

Control of homogeneity:

Homogeneity was tested before being used for the proficiency test. The control of homogeneity was assessed under repeatability conditions (variability within a day). The inter-sample variation of EtG was calculated using analysis of variance for samples A & B, respectively. The samples revealed to be homogenous, with the inter-sample variation coefficients less than 8%.

Statistical analysis:

Statistical analysis was based on robust estimators (median instead of the mean and interquartile range instead of standard deviation), which display the advantage to be less sensitive to extreme values. It was therefore not necessary to identify and remove the outlier values. All laboratory results were thus considered for calculations.
Results that were lower than the defined limit of quantification (LOQ) were not included in the statistical analysis.

Z-score:

The performance of each participating laboratory was assessed by Z-score.
Z-score values were calculated as follows:
$$Z = (x - \chi) / IQ_R$$

Where:
x   corresponds to the individual laboratory's value.
χ corresponds to the median value obtained from participating laboratories.
IQ_R corresponds to the interquartile range calculated as (Q1, 0.25) - (Q3, 0.75)
            (the lower quartile minus the upper quartile).

Decision criteria:

A median value of **+/- 2*IQ$_R$** ($|Z| \leq 2$) was defined as decision criteria for considering the test result positive.

Not passed in Sample A: 3 labs (all LC-MS/MS)
Not passed in Sample B: 2 labs (all LC-MS/MS)
No quantitative result in Sample A: 5 labs (2 LC-MS/MS, 1 GC-MS-NCI, 2 GC-MS/MS-EI)

Certificate of participation:

attached to this letter

Lab code	QC A pg/mg	Diff from Median pg/mg	Z-score	Passed
11	12.2	3.1	-0.74	yes
10	12.5	2.8	-0.67	yes
4	13	2.3	-0.55	yes
17	13	2.3	-0.55	yes
6	13.5	1.8	-0.43	yes
16	14	1.3	-0.31	yes
5	14.2	1.1	-0.26	yes
13	14.6	0.7	-0.17	yes
1	16	-0.7	0.17	yes
12	16	-0.7	0.17	yes
7	16.3	-1	0.24	yes
21	17	-1.7	0.40	yes
9	19.3	-4	0.95	yes
2	33	-17.7	4.21	no
18	40	-24.7	5.88	no
24	49	-33.7	8.02	no
3	ND			
8	NT			
14	ND			
19	ND			
23	< 20			

Average	19.6
SD	11.0
CV %	56.2
Median	15.3
Minimum	12.2
Quartile 25	13.4
Quartile 75	17.6
Maximum	49.0
IQR	4.2
2xIQR	8.4
Accepted range min	6.9
Accepted range max	23.7

Sample A

Z-score

Results PT EtG 2010 Sample A.xls
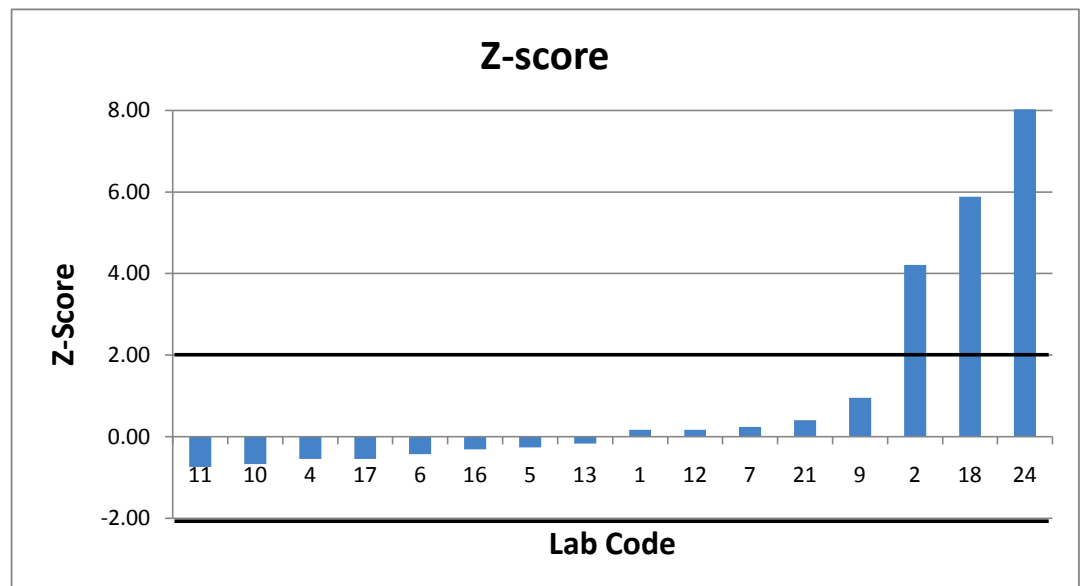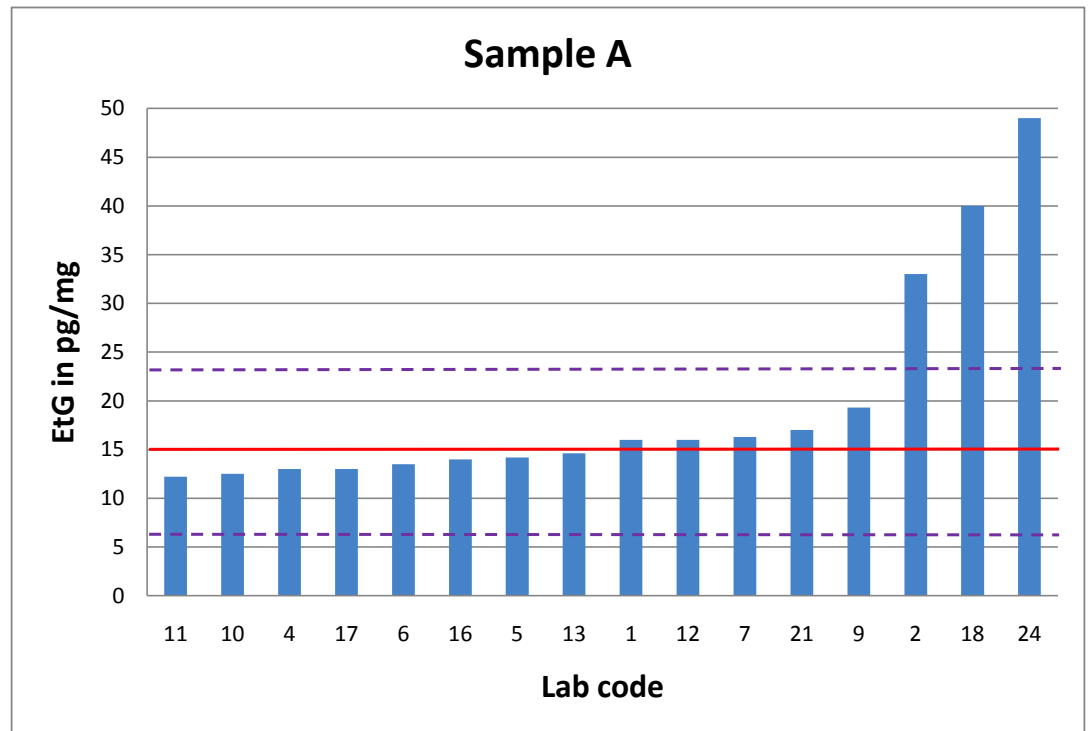
Lab code	QC B pg/mg	Diff from Median pg/mg	Z-score	Passed
3	31	7	-1.17	yes
5	33.8	4.2	-0.70	yes
16	35	3	-0.50	yes
17	35	3	-0.50	yes
24	35	3	-0.50	yes
12	36	2	-0.33	yes
14	36	2	-0.33	yes
23	36.6	1.4	-0.23	yes
4	37	1	-0.17	yes
6	37.4	0.6	-0.10	yes
1	38	0	0.00	yes
11	38.2	-0.2	0.03	yes
7	38.6	-0.6	0.10	yes
9	40.9	-2.9	0.48	yes
8	42	-4	0.67	yes
21	42	-4	0.67	yes
10	43	-5	0.83	yes
19	43.8	-5.8	0.97	yes
18	46	-8	1.33	yes
13	50.7	-12.7	2.12	no
2	67	-29	4.83	no

Average	40.1
SD	7.7
CV %	19.1
Median	38.0
Minimum	31
Quartile 25	36.0
Quartile 75	42.0
Maximum	67.0
IQR	6.0
2xIQR	12
Accepted range min	26
Accepted range max	50

Sample B

Z-score

Results PT EtG 2010 Sample B.xls