IBBL

INTEGRATED BIOBANK OF LUXEMBOURG

FOR NEXT GENERATION HEALTHCARE

PROFICIENCY TESTING REPORT

DNA QUANTIFICATION AND PURITY

isber

INTERNATIONAL SOCIETY FOR BIOLOGICAL AND ENVIRONMENTAL REPOSITORIES

ENDORSED

Proficiency Testing Provider

IBBL (Integrated Biobank of Luxembourg)
6 Rue Nicolas Ernest Barblé
L-1210 Luxembourg
LUXEMBOURG

Coordinator

Fay BETSOU, PhD HDR, IBBL CBS

Contact us

Tel: +352 26970 - 520 (Mon-Fri 9 AM-5 PM CET)
Email: isberpt@ibbl.lu
Web: http://www.ibbl.lu

Round: DNAQ16R1

Preliminary ❐; Final ✓; Amended ❐
Date of Round Closure: 21st October 2016
Report Number: DNAQ16R1_Report01
Comments (reason for amendment or re-issue):

Participant's name: Okayama University Hospital Biobank
Participant Code: L261

SECTION 1 - General Information

Design of the DNA Quantification and Purity Scheme: The DNA used for this scheme was extracted from whole blood. Three different Test Items containing DNA at a different concentration and 260/280 ratio (i.e. Tube A, Tube B and Tube C) were provided to each Participant. No processing was required at reception. The Test Items were stored at -80°C and tested at room temperature.

For each Test Item (Tube A, Tube B and Tube C), the DNA concentration (µg/ml) and 260/280 ratio were measured following the Participant's usual routine testing method(s). The results were reported by all Participants through the website http://biospecimenpt.ibbl.lu, and were collected under the following methods: Spectrophotometry, Spectrofluorometry, Microfluidic LabOnchip, Trinean Spectrophotometry (with cDROP software) and Other.

Confidentiality: The identities of Participants and their results and performance are kept confidential and are known only to persons involved in the operation of the PT Scheme.

Subcontractors: IBBL is implementing this Program internationally in collaboration with ISBER, the International Society for Biological and Environmental Repositories, based at 375 West 5th Ave, Suite 201, Vancouver, BC, Canada V5Y 1J6. The ISBER PT Advisory Group participates in the development of the annual PT program, in the Value Assignment of the Test Items, and provides advice to PT Participants.

Technical data: For your reference, all information related to the description of the Test Item is included in the "Test Item Information Sheet" (TIIS) which was provided to you along with the samples. Extra copies can be downloaded on IBBL's website (http://www.ibbl.lu/ibbl-services/pt/proficiency-testing-schemes/).

Personalized Advice Service: Advice and educational feedback to Participants is available on demand (please contact IBBL using details on page 1 of this report).

Customer Satisfaction Survey: IBBL seeks the feedback of all Participants, both positive and negative, to be used and analysed to improve its management system, future Schemes, and customer service. Please complete our survey, available online: https://www.surveymonkey.com/r/IBBL2016PT

SECTION 2 – General Statistics

63 Participants registered for the DNA Quantification and Purity Round performed in 2016.

Geographic Origin of Participants

Country	Count	%
AUSTRALIA	1	2
BELGIUM	4	6
CANADA	3	5
CHINA	2	3
DENMARK	1	2
FRANCE	2	3
GERMANY	1	2
IRELAND	1	2
JAPAN	3	5
KOREA, REPUBLIC OF	5	8
LUXEMBOURG	1	2
NETHERLANDS	1	2
NIGERIA	1	2
NORWAY	2	3
SINGAPORE	2	3
SOUTH AFRICA	1	2
SPAIN	2	3
SWEDEN	2	3
SWITZERLAND	1	2
UGANDA	1	2
UNITED ARAB EMIRATES	1	2
UNITED KINGDOM	1	2
UNITED STATES	24	38

Type of Facilities

Facility	Count	%
not specified	42	67
Hospital Laboratory	9	14
Private Laboratory	5	8
University/Academic	7	11

Methodologies Used

DNA Concentration - Other	5
DNA Concentration - Spectrofluorometry	22
DNA Concentration - Spectrophotometry	45
DNA Concentration - Trinean Spectrophotometry	8
DNA Ratio 260/280 - Spectrophotometry	46
DNA Ratio 260/280 - Trinean Spectrophotometry	8

Type of Spectrophotometry Measurement Container

Container	Count	%
not specified	41	65
Cuvette	1	2
Microplate	9	14
Tube	12	19

Type of Spectrofluorometry Measurement Container

Container	Count	%
not specified	17	27
Microplate	6	10
Microspot	28	44
Other	12	19

Type of Trinean Spectrophotometry Container

Container	Count	%
not specified	54	86
DropPlate D+	1	2
DropPlate S	8	13

SECTION 3 – Data Analysis Results and Evaluation of Performance

Statistical Procedure Used

Statistical procedures used were those proposed by the International Harmonized Protocol for the Proficiency Testing of Analytical Chemistry Laboratories (IUPAC Technical Report 2006). The standard deviation for Proficiency Testing was determined by the ISBER Proficiency Testing Advisory Group. The outliers were calculated with the Grubb's test, and were excluded from the statistical summaries.

The scoring system is based on deviation from the assigned value.

Deviation from assigned value (z-score)	Consensus Score
< 1 standard deviation	0
≤ 2 standard deviation	1
> 2 standard deviation	2
> 3 standard deviation	3

Spectrophotometry DNA concentration and ratio assigned values were obtained with the spectrophotometry method and were based on the participant consensus value.

Spectrofluorometry DNA concentration assigned values were obtained with the spectrofluorometry method and were based on the participant consensus value.

Trinean cDrop DNA concentration and ratio assigned values were obtained with the Trinean cDrop method and were based on expert laboratories.

DNA Concentration - Spectrophotometry

YOU DID NOT SUBMIT RESULTS WITH THIS METHOD

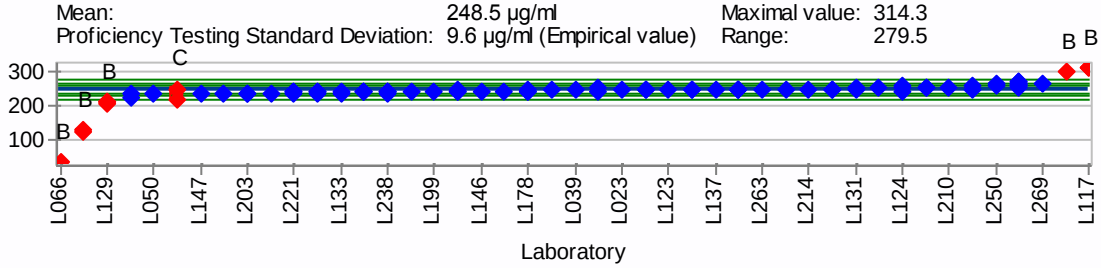
Expected Results

Panel Composition and expected result (mean values and participant data standard deviations)

Sample	Sample content	Mean (µg/ml)	Proficiency testing standard deviation (µg/ml)
Tube A	DNA	248.5	9.6
Tube B	DNA	119.5	5.9
Tube C	DNA	32.7	3.8

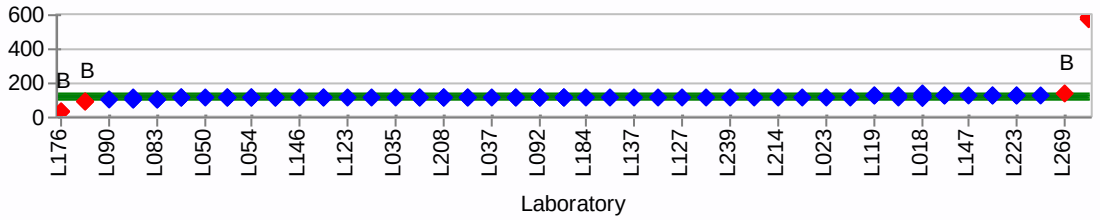
Tube A Results

No. of laboratories:	39	Median:	246.1
No. of outlier values:	11	Minimal value:	34.8
Mean:	248.5 µg/ml	Maximal value:	314.3
Proficiency Testing Standard Deviation:	9.6 µg/ml (Empirical value)	Range:	279.5



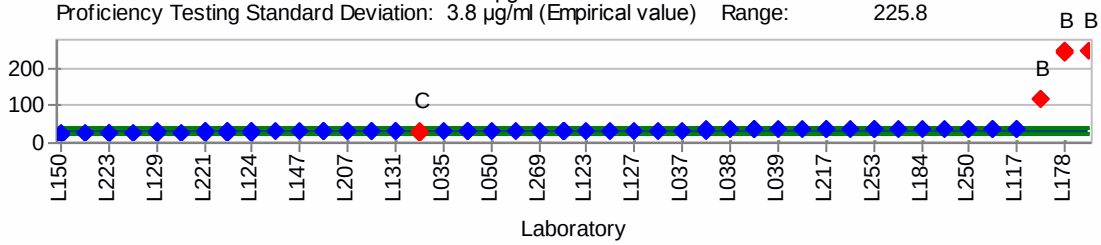
Tube B Results

No. of laboratories:	40	Median:	118.9
No. of outlier values:	7	Minimal value:	31.4
Mean:	119.5 µg/ml	Maximal value:	583.7
Proficiency Testing Standard Deviation:	5.9 µg/ml (Empirical value)	Range:	552.3

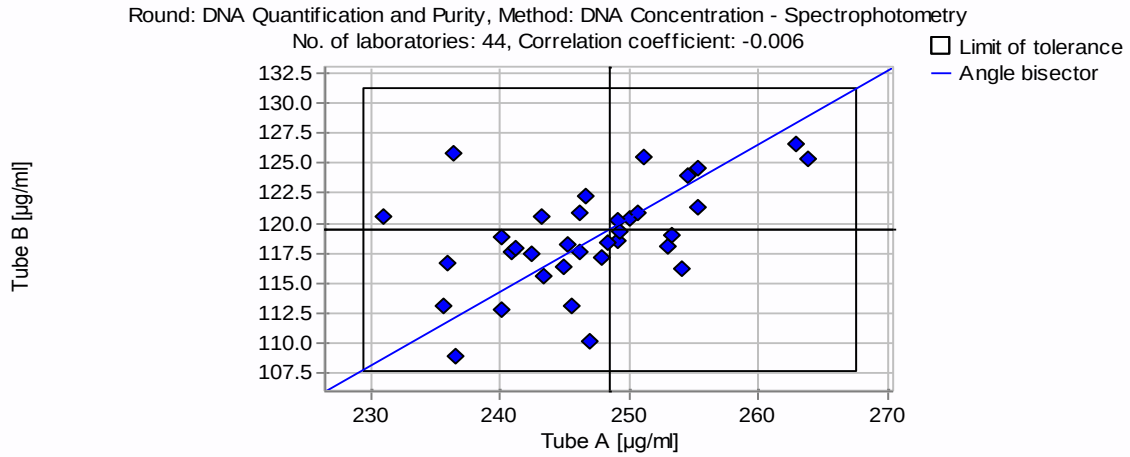


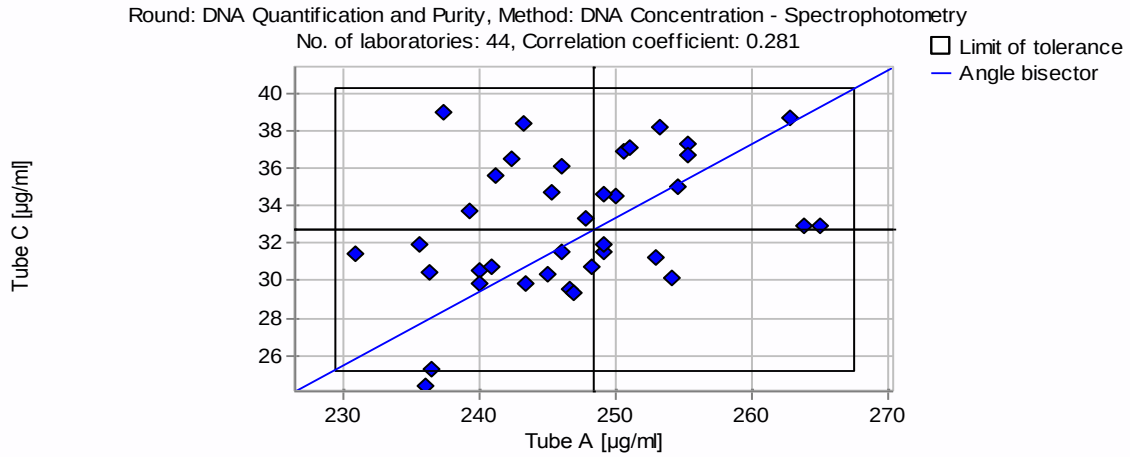
Tube C Results

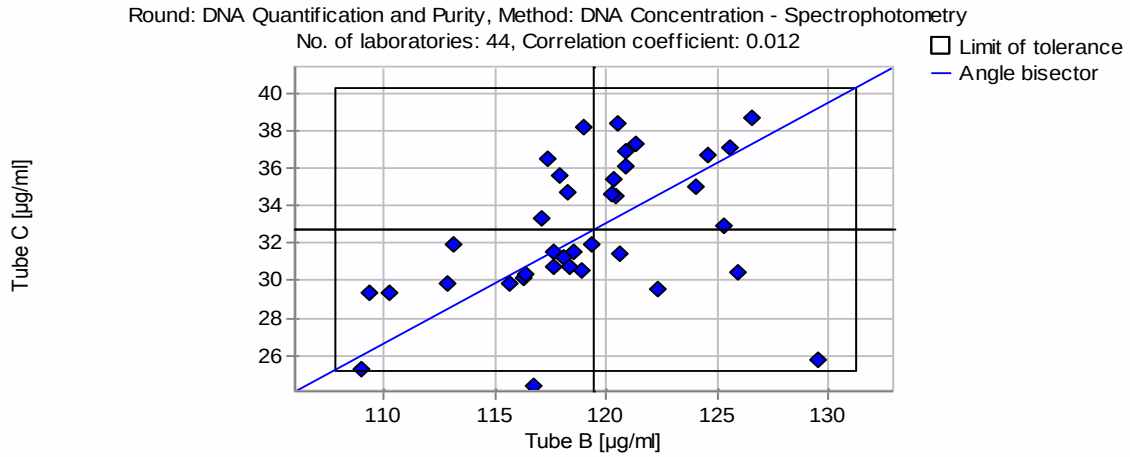
No. of laboratories:	40	Median:	33.2
No. of outlier values:	8	Minimal value:	23.4
Mean:	32.7 µg/ml	Maximal value:	249.2
Proficiency Testing Standard Deviation:	3.8 µg/ml (Empirical value)	Range:	225.8



Youden Plot For DNA Concentration - Spectrophotometry







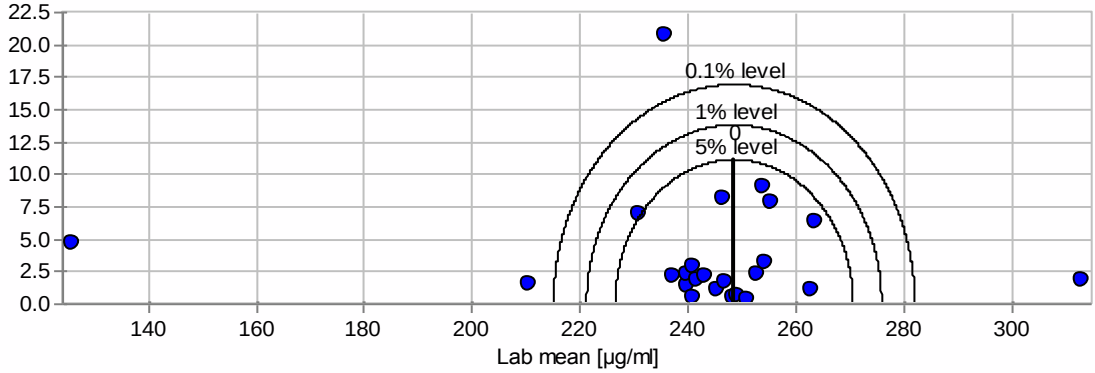
Comment on Youden Plot Interpretation

In the Youden plot, points that lie near the 45-degree reference line but far from the crossing of the assigned values indicate large systematic error. Points that lie far from the 45-degree line indicate large random error. Points outside the rectangle indicate large total error.

If your result is not visible in the graph, it means it falls outside the graph limits and corresponds to a high total error.

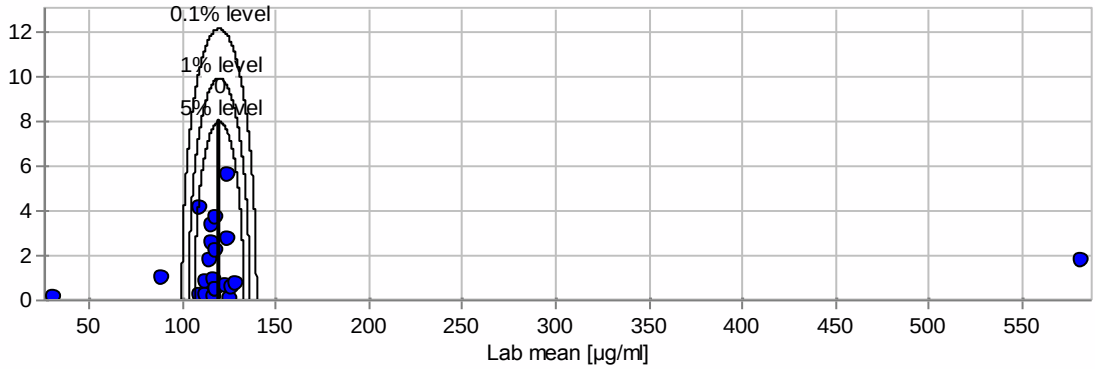
Lischer Plot For DNA Concentration - Spectrophotometry

Tube A Results



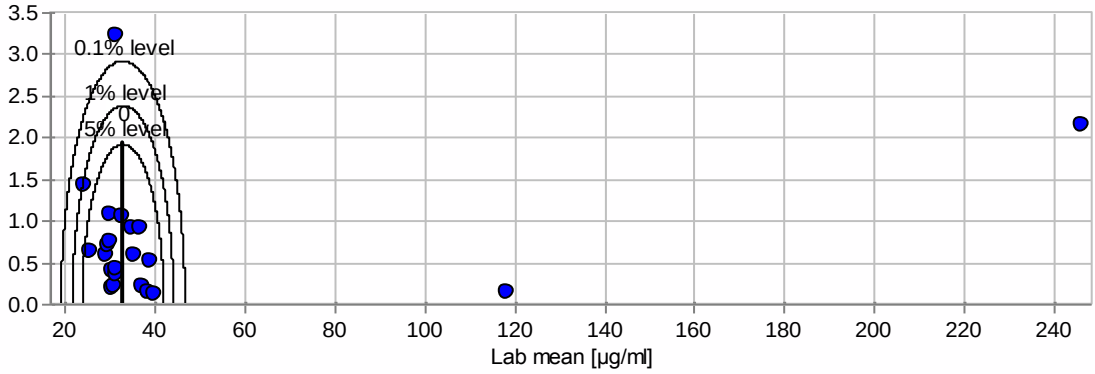
PROLab Plus

Tube B Results



PROLab Plus

Tube C Results



PROLab Plus

Comment on Lischer Plot Interpretation

Lischer plots are used to assess the within-laboratory variability for a method, which allows the identification of irregularities between different analyses in a laboratory (performed by different analysts or on different units of equipment or on different days). The Lischer plot was constructed by plotting the standard deviation against the corresponding laboratory mean value of test results across

all analyses. A confidence level of 95% was statistically calculated (line labelled "5% level"). The location of laboratory and method combinations inside this area indicate no significant differences for the test results within a laboratory.

You did not report measurement repetitions, therefore, no within-laboratory variability can be computed and shown in the chart.

Your History of Z-Scores

You did not participate with this method in the scheme nor did you participate with this method in any previous scheme. Therefore, no history of your Z-Scores is available yet.

DNA Concentration - Spectrofluorometry

YOU SUBMITTED RESULTS WITH THIS METHOD

Expected Results

Panel Composition and expected result (mean values and participant data standard deviations)

Sample	Sample content	Mean (µg/ml)	Proficiency testing standard deviation (µg/ml)
Tube A	DNA	175.7	43.2
Tube B	DNA	64.8	16.6
Tube C	DNA	20.5	6.0

Your Results

Sample	Sample content	Your result (µg/ml)	Lab-internal s.d. (2 replicates) (µg/ml)	Your consensus score
Tube A	DNA	184.5	12.0	0
Tube B	DNA	72.4	7.5	0
Tube C	DNA	20.9	0.1	0
Sum quantitative panel score				0

Your z-score for the 3 DNA Concentration - Spectrofluorometry measures is 0.204 (Tube A), 0.459 (Tube B) and 0.080 (Tube C).

Your z-score for DNA Concentration - Spectrofluorometry has been designated as "accurate" or "very satisfactory".

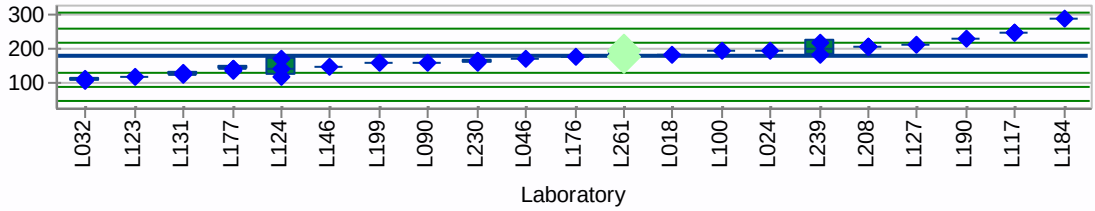
Your z-score for DNA Concentration - Spectrofluorometry has been designated as "accurate" or "very satisfactory".

Your z-score for DNA Concentration - Spectrofluorometry has been designated as "accurate" or "very satisfactory".

If your z-score has been designated as "questionable" or "requiring action", some additional feedback may be found at the end of this report.

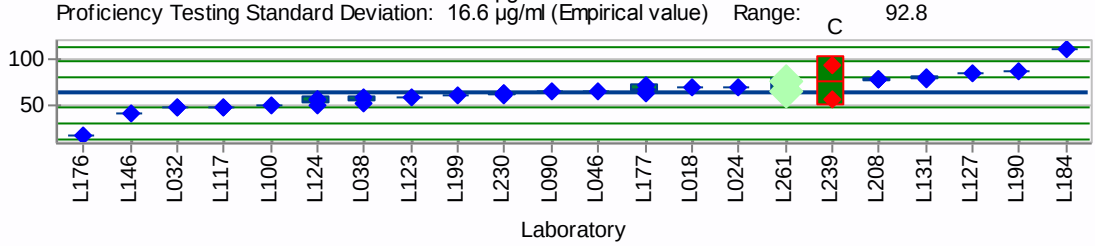
Tube A Results

No. of laboratories:	21	Median:	178.7
No. of outlier values:	0	Minimal value:	110.0
Mean:	175.7 µg/ml	Maximal value:	291.0
Proficiency Testing Standard Deviation:	43.2 µg/ml (Empirical value)	Range:	181.0



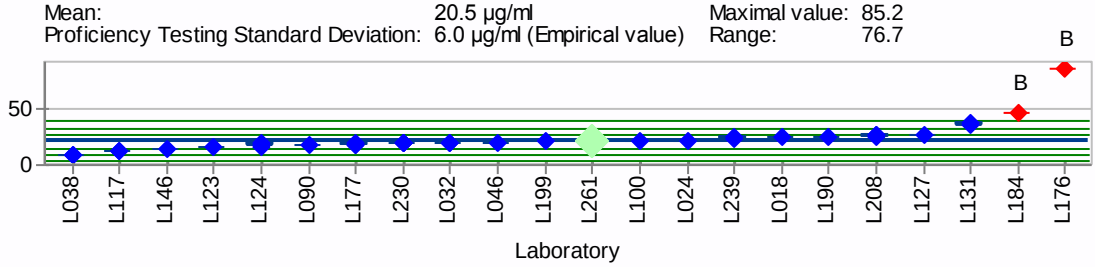
Tube B Results

No. of laboratories:	21	Median:	66.3
No. of outlier values:	2	Minimal value:	18.2
Mean:	64.8 µg/ml	Maximal value:	111.0
Proficiency Testing Standard Deviation:	16.6 µg/ml (Empirical value)	Range:	92.8



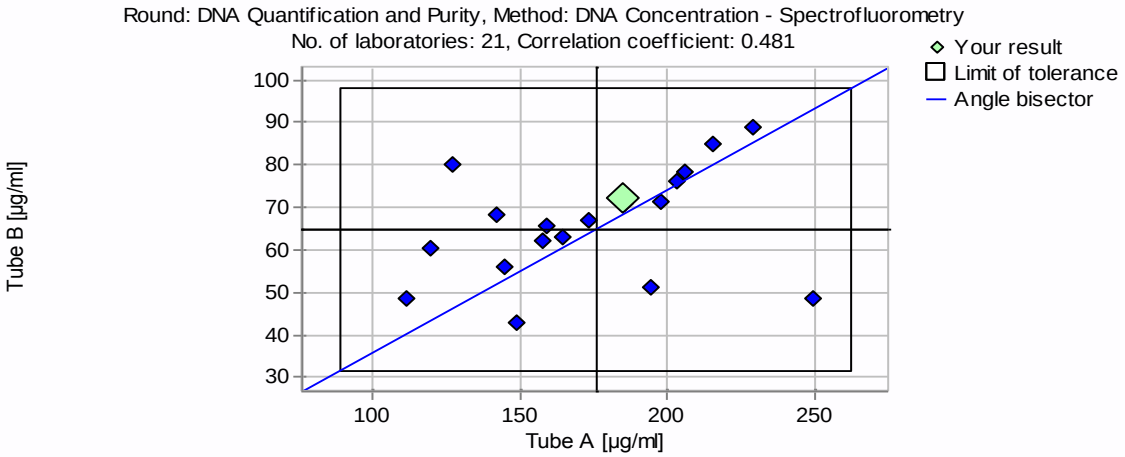
Tube C Results

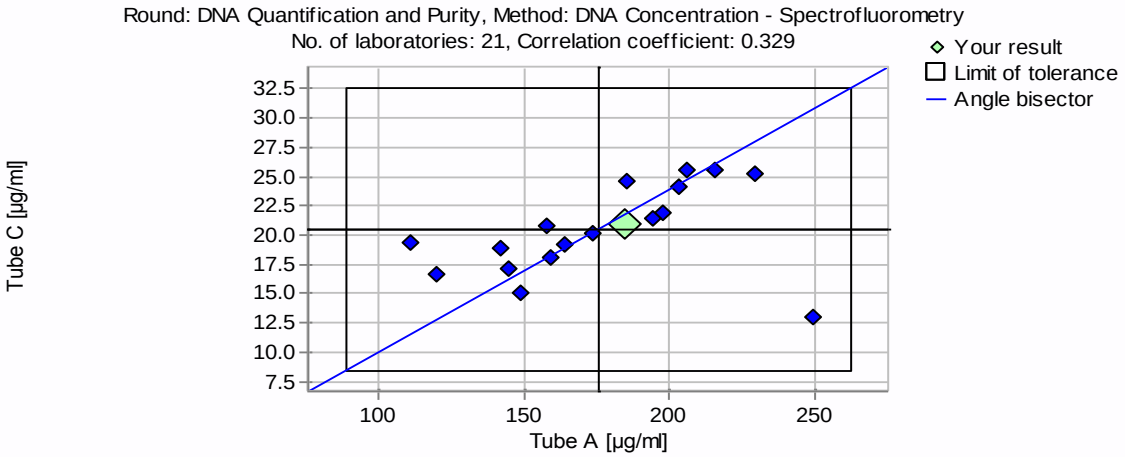
No. of laboratories:	20	Median:	20.9
No. of outlier values:	2	Minimal value:	8.5
Mean:	20.5 µg/ml	Maximal value:	85.2
Proficiency Testing Standard Deviation:	6.0 µg/ml (Empirical value)	Range:	76.7

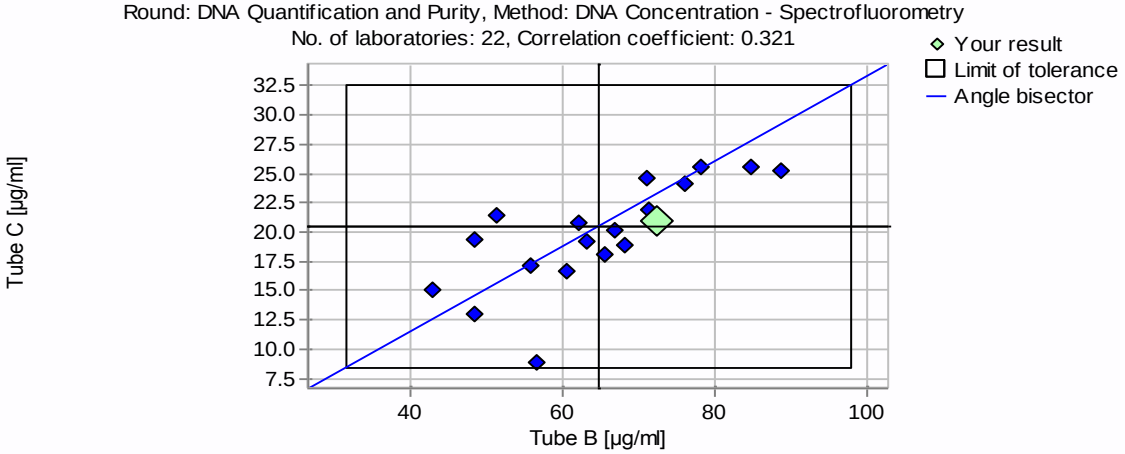


Your results are shown in green.

Youden Plot For DNA Concentration - Spectrofluorometry







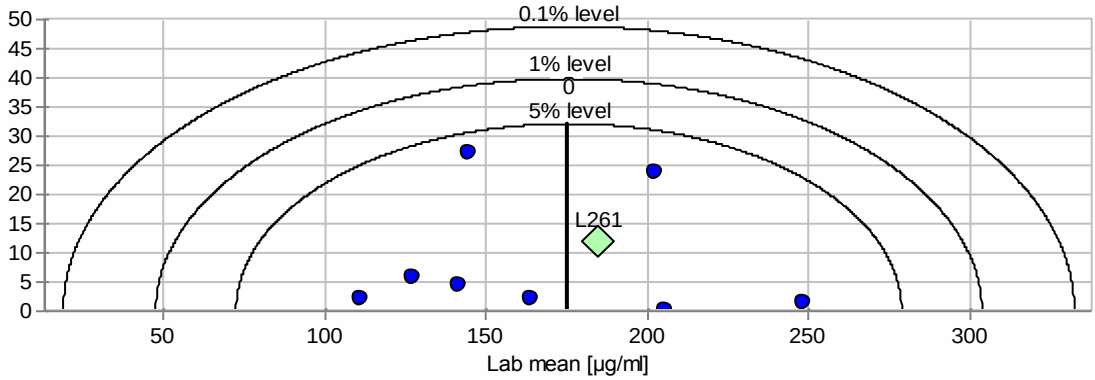
Comment on Youden Plot Interpretation

In the Youden plot, points that lie near the 45-degree reference line but far from the crossing of the assigned values indicate large systematic error. Points that lie far from the 45-degree line indicate large random error. Points outside the rectangle indicate large total error.

If your result is not visible in the graph, it means it falls outside the graph limits and corresponds to a high total error.

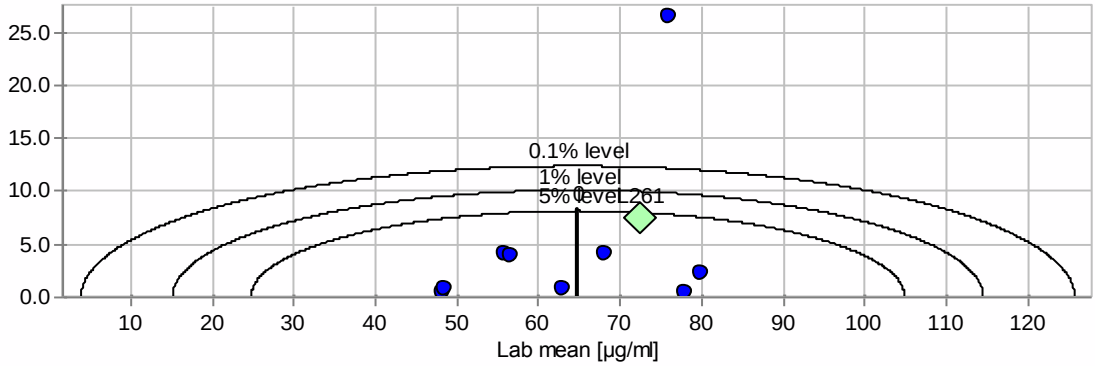
Lischer Plot For DNA Concentration - Spectrofluorometry

Tube A Results



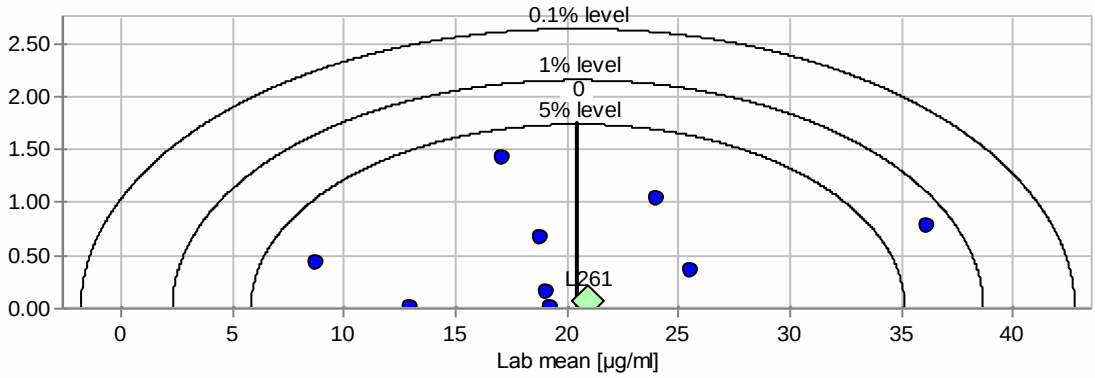
PROLab Plus

Tube B Results



PROLab Plus

Tube C Results



PROLab Plus

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all analyses. A confidence level of 95% was statistically calculated (line labelled "5% level"). The location of laboratory and method combinations inside this area indicate no significant differences for the test results within a laboratory.

Your results are shown in green.

Your History of Z-Scores

This is your first participation with this method in the scheme; therefore, no history of your z-scores is available yet.

A history of your z-scores will be available in your future participations.

DNA Concentration - Trinean Spectrophotometry

YOU DID NOT SUBMIT RESULTS WITH THIS METHOD

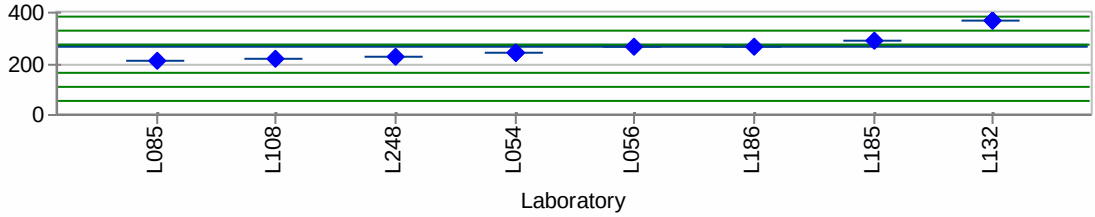
Expected Results

Panel Composition and expected results (assigned values with their uncertainties)

Sample	Sample content	Assigned value (µg/ml)	Total uncertainty of the assigned value (µg/ml)	Proficiency testing standard deviation (µg/ml)
Tube A	DNA	219.8	10.8	55.0
Tube B	DNA	83.2	4.0	20.8
Tube C	DNA	26.0	1.4	6.5

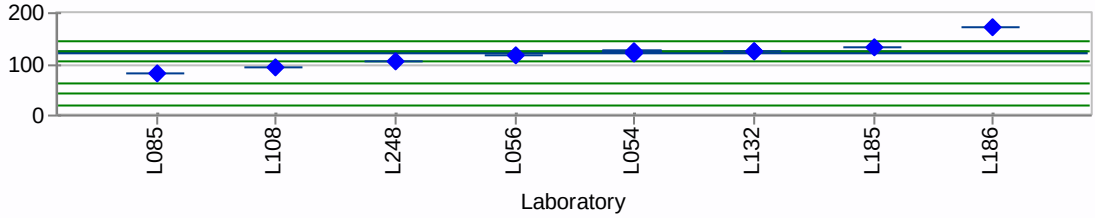
Tube A Results

No. of laboratories:	8	Median:	255.3
No. of outlier values:	0	Minimal value:	210.6
Mean:	269.3 µg/ml	Maximal value:	371.1
Proficiency Testing Standard Deviation:	55.0 µg/ml (Limited)	Range:	160.5



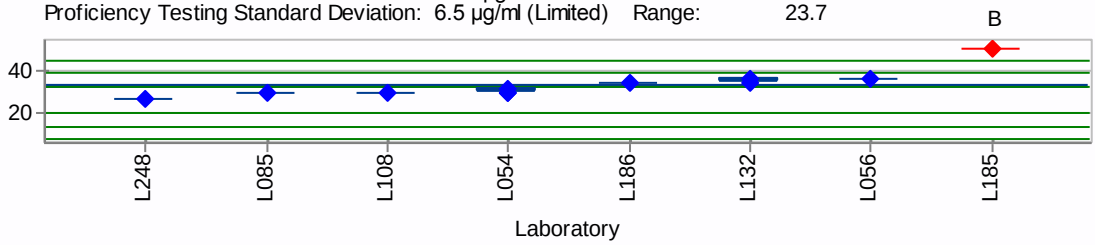
Tube B Results

No. of laboratories:	8	Median:	121.2
No. of outlier values:	0	Minimal value:	82.3
Mean:	120.9 µg/ml	Maximal value:	172.3
Proficiency Testing Standard Deviation:	20.8 µg/ml (Limited)	Range:	90.0

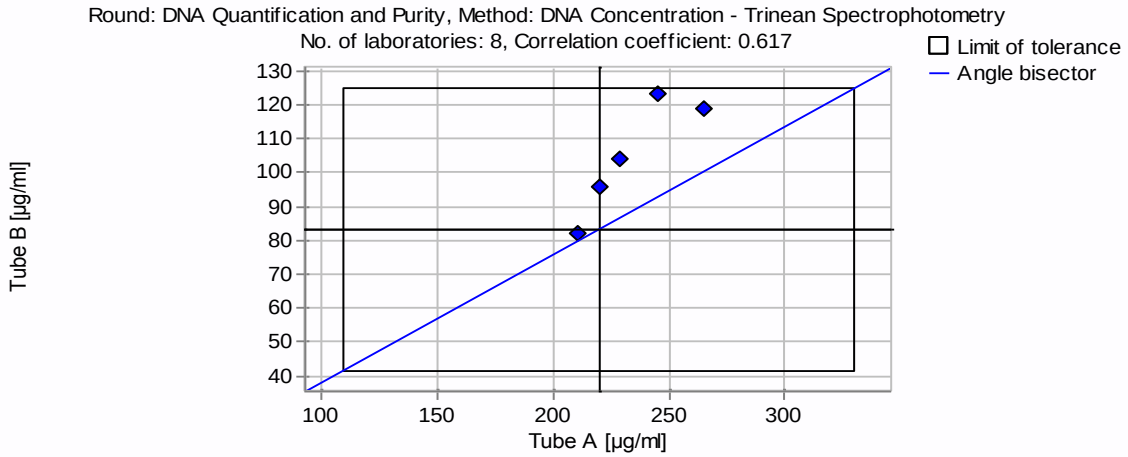


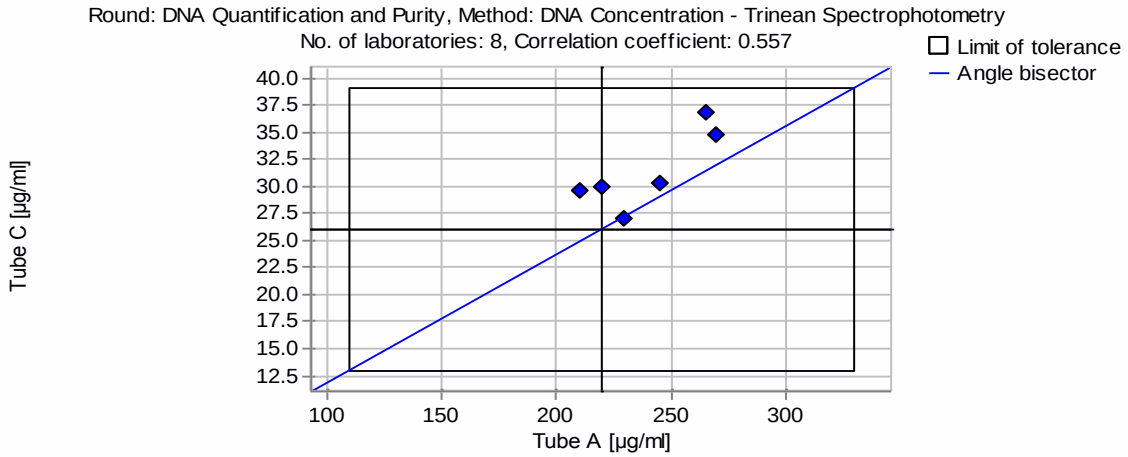
Tube C Results

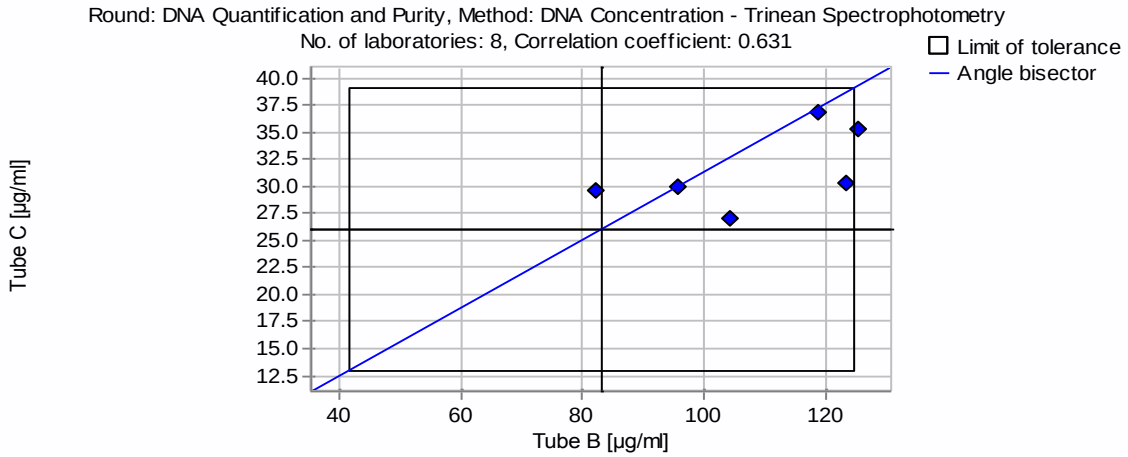
No. of laboratories:	7	Median:	32.4
No. of outlier values:	1	Minimal value:	27.0
Mean:	32.0 µg/ml	Maximal value:	50.8
Proficiency Testing Standard Deviation:	6.5 µg/ml (Limited)	Range:	23.7



Youden Plot For DNA Concentration - Trinean Spectrophotometry







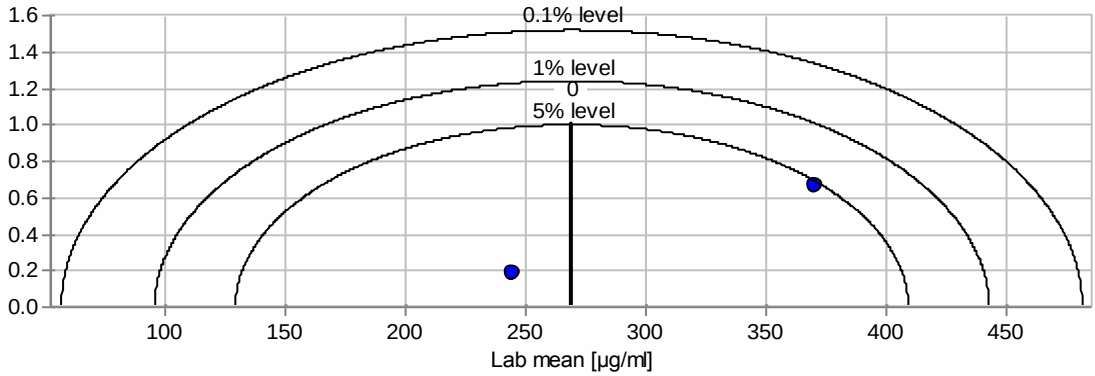
Comment on Youden Plot Interpretation

In the Youden plot, points that lie near the 45-degree reference line but far from the crossing of the assigned values indicate large systematic error. Points that lie far from the 45-degree line indicate large random error. Points outside the rectangle indicate large total error.

If your result is not visible in the graph, it means it falls outside the graph limits and corresponds to a high total error.

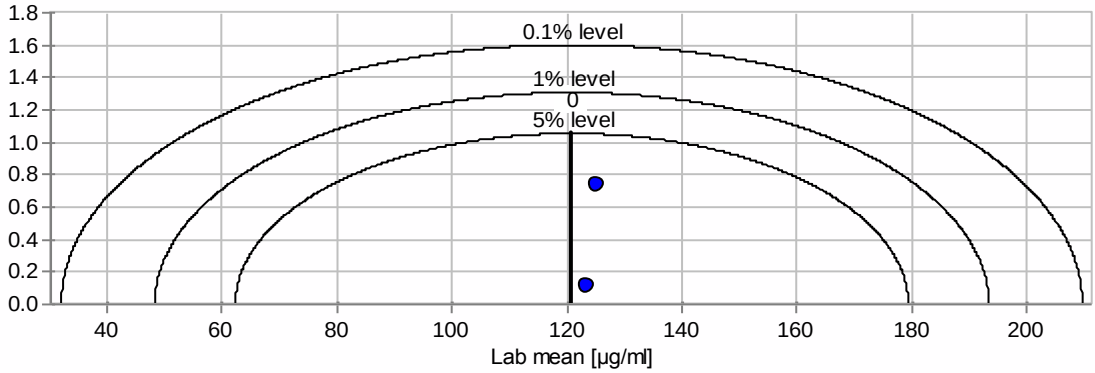
Lischer Plot For DNA Concentration - Trinean Spectrophotometry

Tube A Results



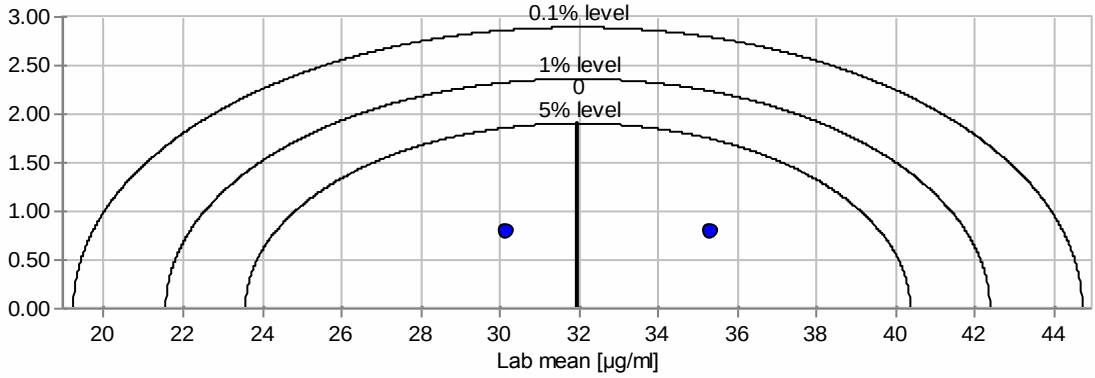
PROLab Plus

Tube B Results



PROLab Plus

Tube C Results



PROLab Plus

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all analyses. A confidence level of 95% was statistically calculated (line labelled "5% level"). The location of laboratory and method combinations inside this area indicate no significant differences for the test results within a laboratory.

You did not report measurement repetitions, therefore, no within-laboratory variability can be computed and shown in the chart.

Your History of Z-Scores

You did not participate with this method in the scheme nor did you participate with this method in any previous scheme. Therefore, no history of your Z-Scores is available yet.

DNA Concentration - Other

YOU DID NOT SUBMIT RESULTS WITH THIS METHOD

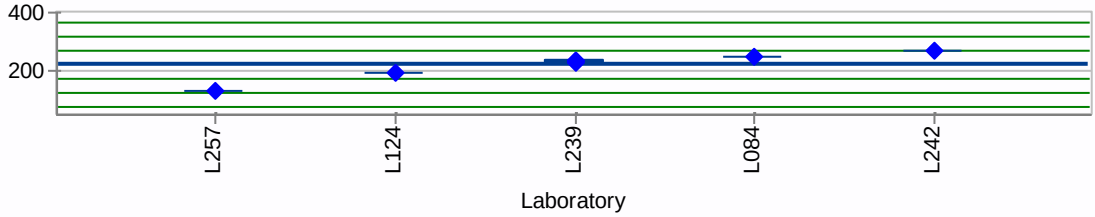
Expected Results

Panel Composition and expected result (mean values and participant data standard deviations)

Sample	Sample content	Mean (µg/ml)	Proficiency testing standard deviation (µg/ml)
Tube A	DNA	222.3	48.2
Tube B	DNA	119.3	25.5
Tube C	DNA	29.1	5.4

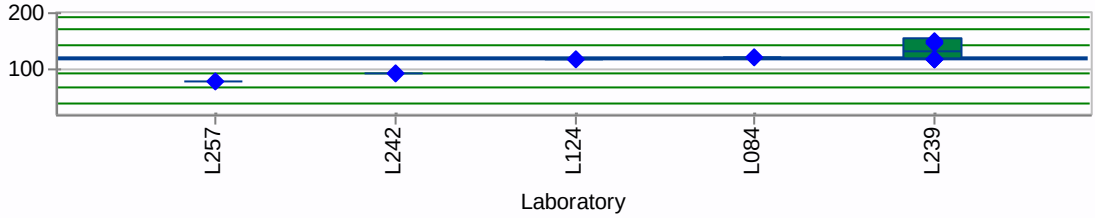
Tube A Results

No. of laboratories:	5	Median:	232.7
No. of outlier values:	0	Minimal value:	131.2
Mean:	222.3 µg/ml	Maximal value:	271.2
Proficiency Testing Standard Deviation:	48.2 µg/ml (Empirical value)	Range:	140.0



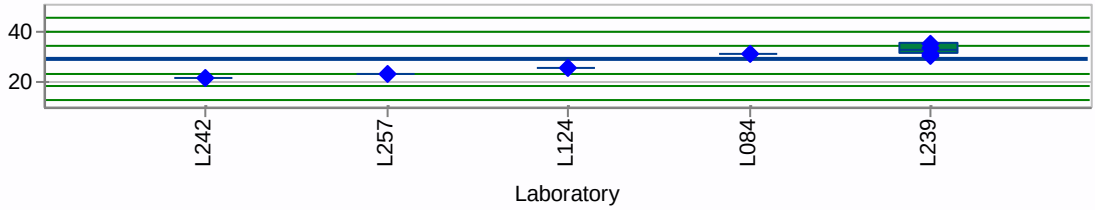
Tube B Results

No. of laboratories:	5	Median:	120.1
No. of outlier values:	0	Minimal value:	80.4
Mean:	119.3 µg/ml	Maximal value:	151.6
Proficiency Testing Standard Deviation:	25.5 µg/ml (Empirical value)	Range:	71.2

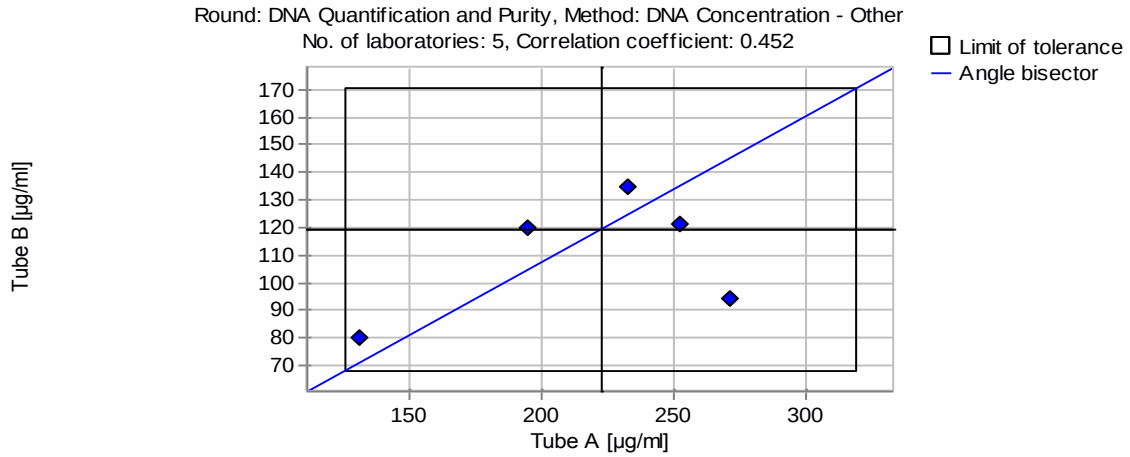


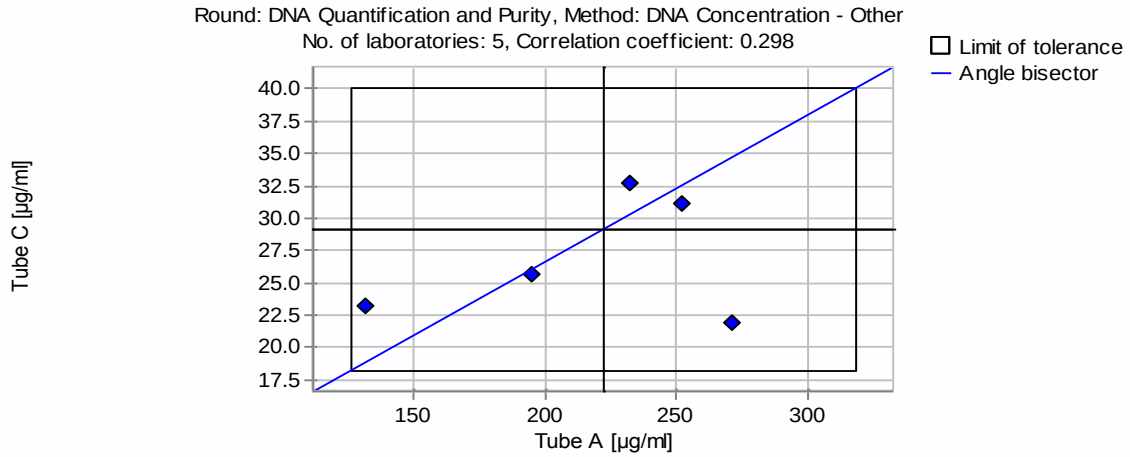
Tube C Results

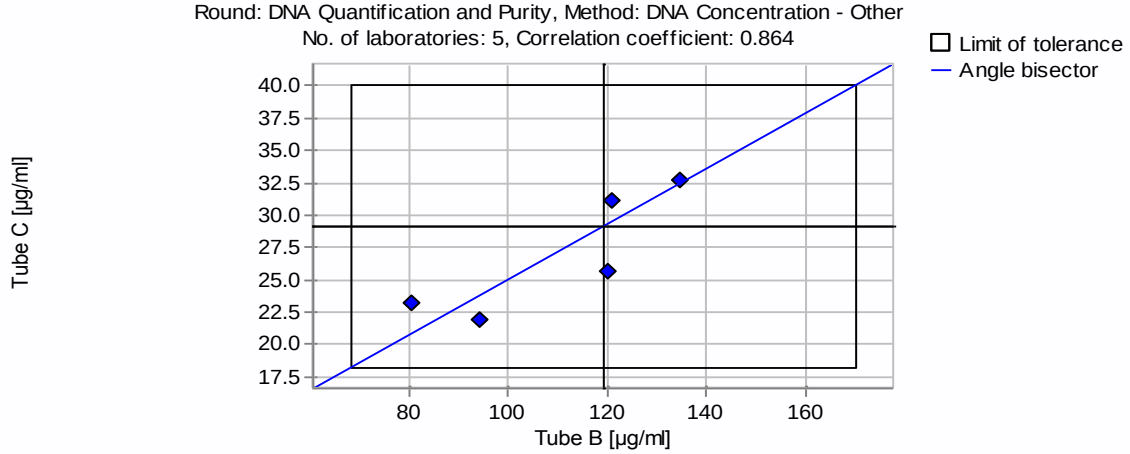
No. of laboratories:	5	Median:	25.7
No. of outlier values:	0	Minimal value:	21.9
Mean:	29.1 µg/ml	Maximal value:	35.5
Proficiency Testing Standard Deviation:	5.4 µg/ml (Empirical value)	Range:	13.5



Youden Plot For DNA Concentration - Other







Comment on Youden Plot Interpretation

In the Youden plot, points that lie near the 45-degree reference line but far from the crossing of the assigned values indicate large systematic error. Points that lie far from the 45-degree line indicate large random error. Points outside the rectangle indicate large total error.

If your result is not visible in the graph, it means it falls outside the graph limits and corresponds to a high total error.

Your History of Z-Scores

You did not participate with this method in the scheme nor did you participate with this method in any previous scheme. Therefore, no history of your Z-Scores is available yet.

DNA Purity (Ratio 260/280) - Spectrophotometry

YOU DID NOT SUBMIT RESULTS WITH THIS METHOD

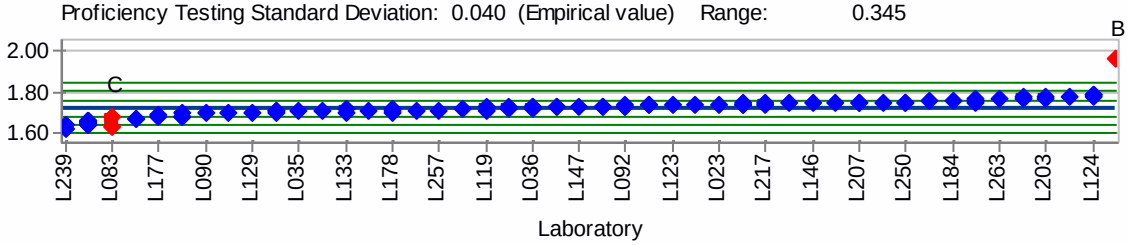
Expected Results

Panel Composition and expected result (mean values and participant data standard deviations)

Sample	Sample content	Mean	Proficiency testing standard deviation
Tube A	DNA	1.720	0.040
Tube B	DNA	1.329	0.044
Tube C	DNA	1.928	0.129

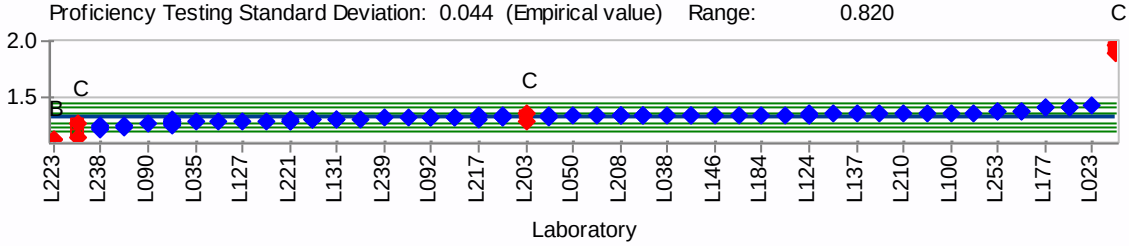
Tube A Results

No. of laboratories:	44	Median:	1.730
No. of outlier values:	3	Minimal value:	1.615
Mean:	1.720	Maximal value:	1.960
Proficiency Testing Standard Deviation:	0.040 (Empirical value)	Range:	0.345



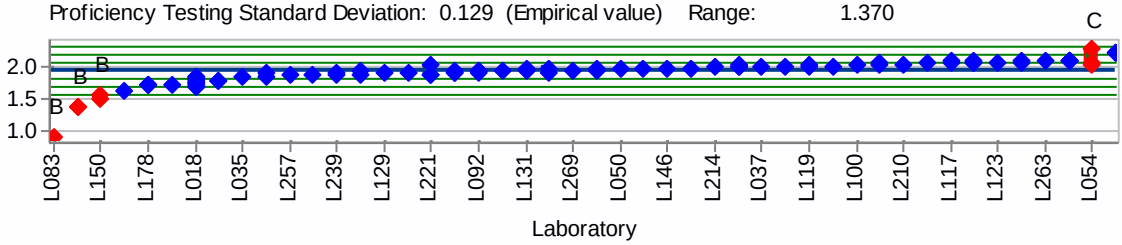
Tube B Results

No. of laboratories:	42	Median:	1.340
No. of outlier values:	8	Minimal value:	1.140
Mean:	1.329	Maximal value:	1.960
Proficiency Testing Standard Deviation:	0.044 (Empirical value)	Range:	0.820

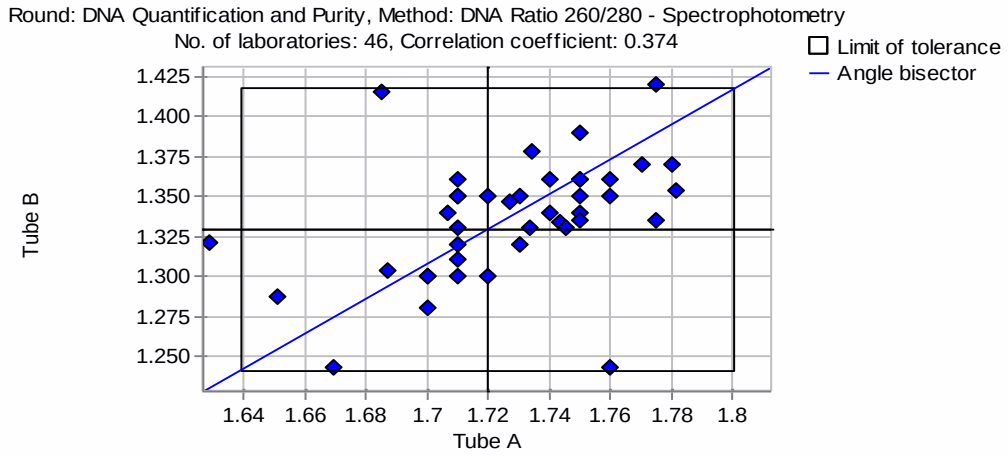


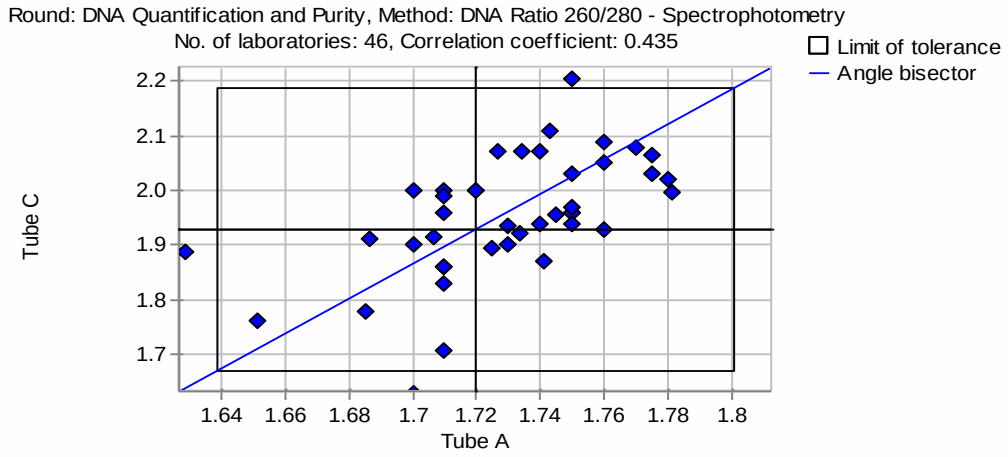
Tube C Results

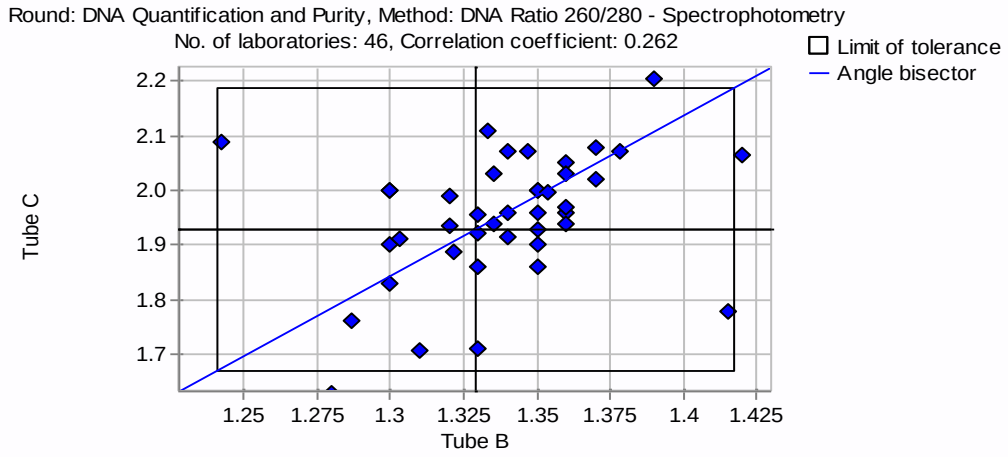
No. of laboratories:	42	Median:	1.948
No. of outlier values:	8	Minimal value:	0.890
Mean:	1.928	Maximal value:	2.260
Proficiency Testing Standard Deviation:	0.129 (Empirical value)	Range:	1.370



Youden Plot For DNA Purity (Ratio 260/280) - Spectrophotometry







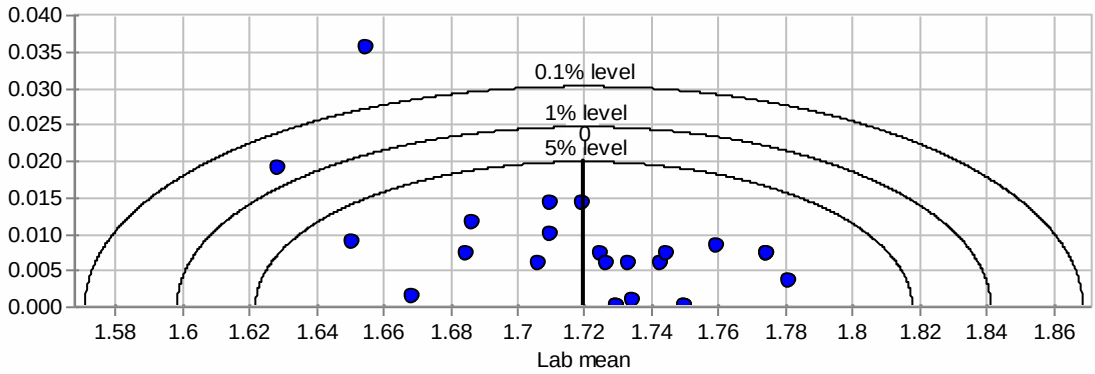
Comment on Youden Plot Interpretation

In the Youden plot, points that lie near the 45-degree reference line but far from the crossing of the assigned values indicate large systematic error. Points that lie far from the 45-degree line indicate large random error. Points outside the rectangle indicate large total error.

If your result is not visible in the graph, it means it falls outside the graph limits and corresponds to a high total error.

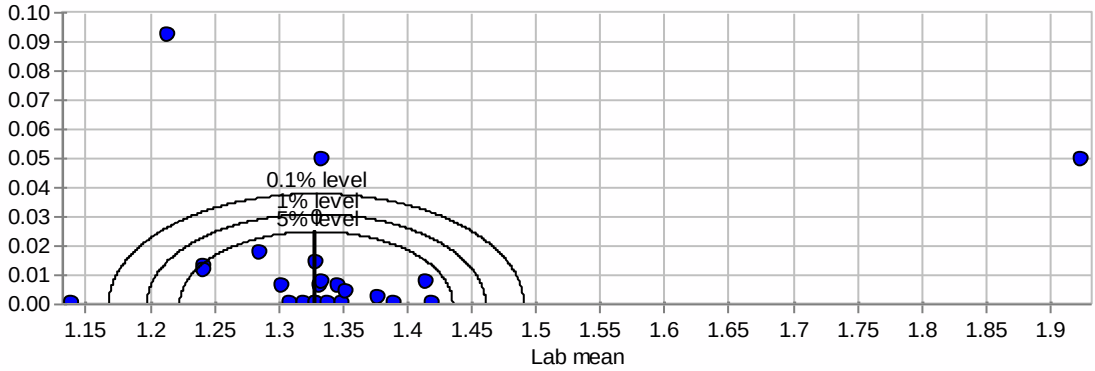
Lischer Plot For DNA Purity (Ratio 260/280) - Spectrophotometry

Tube A Results



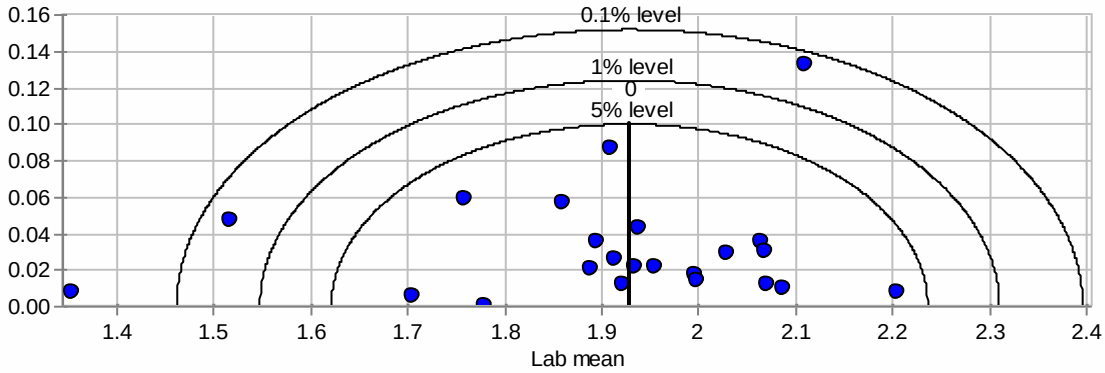
PROLab Plus

Tube B Results



PROLab Plus

Tube C Results



PROLab Plus

Comment on Lischer Plot Interpretation

Lischer plots are used to assess the within-laboratory variability for a method, which allows the identification of irregularities between different analyses in a laboratory (performed by different analysts or on different units of equipment or on different days). The Lischer plot was constructed by plotting the standard deviation against the corresponding laboratory mean value of test results across

all analyses. A confidence level of 95% was statistically calculated (line labelled "5% level"). The location of laboratory and method combinations inside this area indicate no significant differences for the test results within a laboratory.

You did not report measurement repetitions, therefore, no within-laboratory variability can be computed and shown in the chart.

Your History of Z-Scores

You did not participate with this method in the scheme nor did you participate with this method in any previous scheme. Therefore, no history of your Z-Scores is available yet.

DNA Purity (Ratio 260/280) - Trinean Spectrophotometry

YOU DID NOT SUBMIT RESULTS WITH THIS METHOD

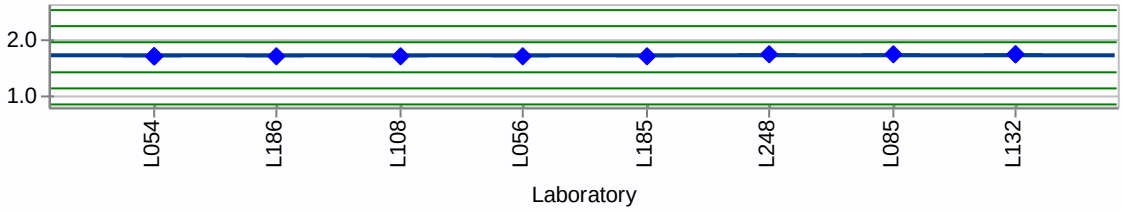
Expected Results

Panel Composition and expected results (assigned values with their uncertainties)

Sample	Sample content	Assigned value	Total uncertainty of the assigned value	Proficiency testing standard deviation
Tube A	DNA	1.700	0.008	0.272
Tube B	DNA	1.300	0.050	0.208

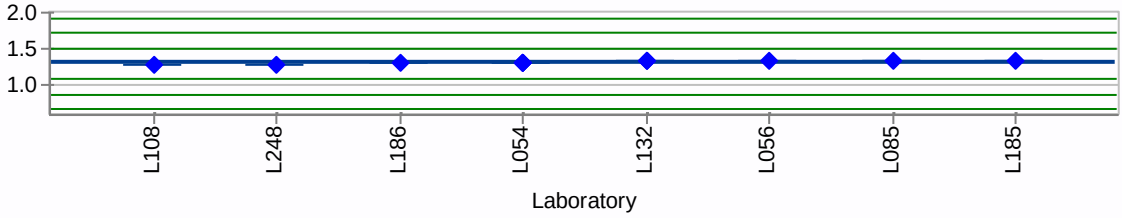
Tube A Results

No. of laboratories:	8	Median:	1.730
No. of outlier values:	0	Minimal value:	1.710
Mean:	1.728	Maximal value:	1.750
Proficiency Testing Standard Deviation:	0.272 (Limited)	Range:	0.040

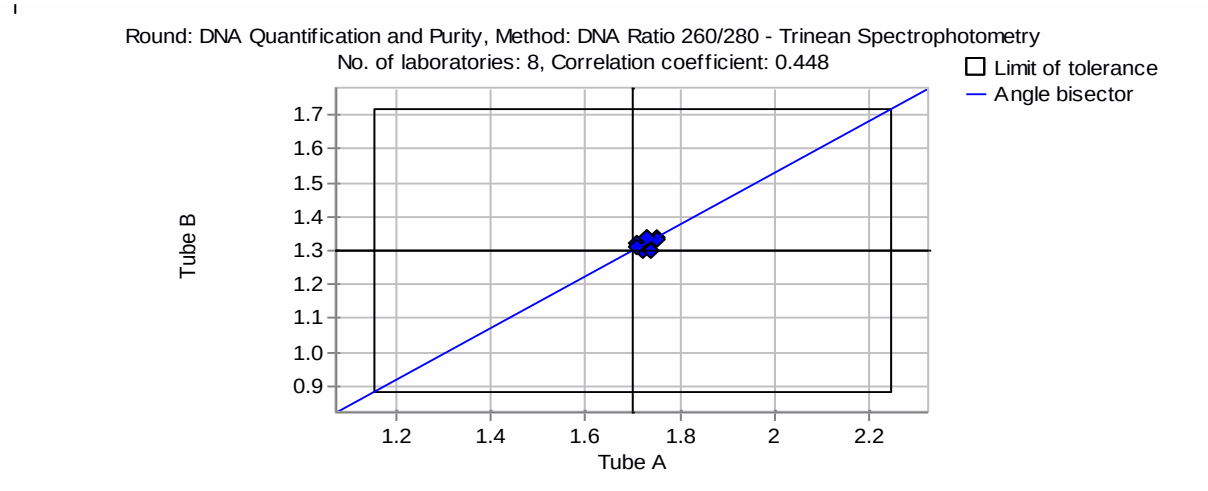


Tube B Results

No. of laboratories:	8	Median:	1.328
No. of outlier values:	0	Minimal value:	1.300
Mean:	1.324	Maximal value:	1.340
Proficiency Testing Standard Deviation:	0.208 (Limited)	Range:	0.040



Youden Plot For DNA Purity (Ratio 260/280) - Trinean Spectrophotometry



Comment on Youden Plot Interpretation

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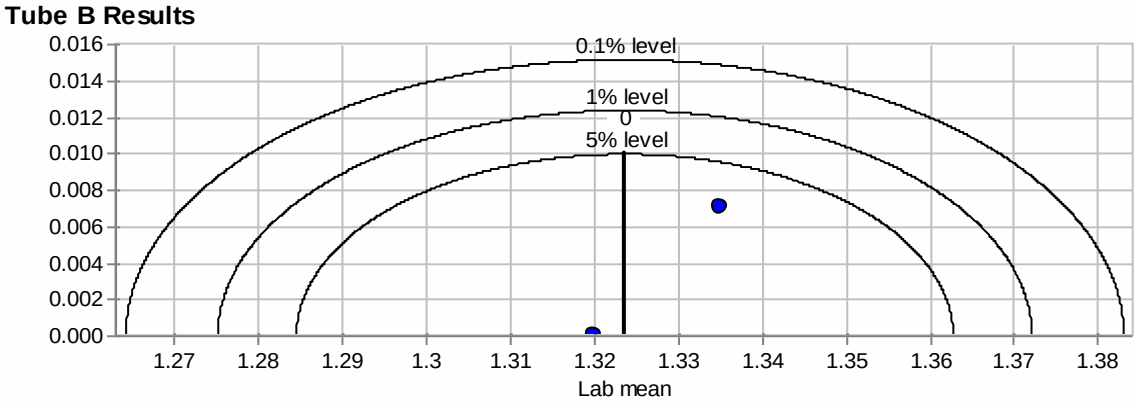
Lischer Plot For DNA Purity (Ratio 260/280) - Trinean Spectrophotometry



PROLab Plus

Comment on Lischer Plot Interpretation

Lischer plots are used to assess the within-laboratory variability for a method, which allows the identification of irregularities between different analyses in a laboratory (performed by different analysts or on different units of equipment or on different days). The Lischer plot was constructed by plotting the standard deviation against the corresponding laboratory mean value of test results across all analyses. A confidence level of 95% was statistically calculated (line labelled "5% level"). The location of laboratory and method combinations inside this area indicate no significant differences for the test results within a laboratory.

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Your History of Z-Scores

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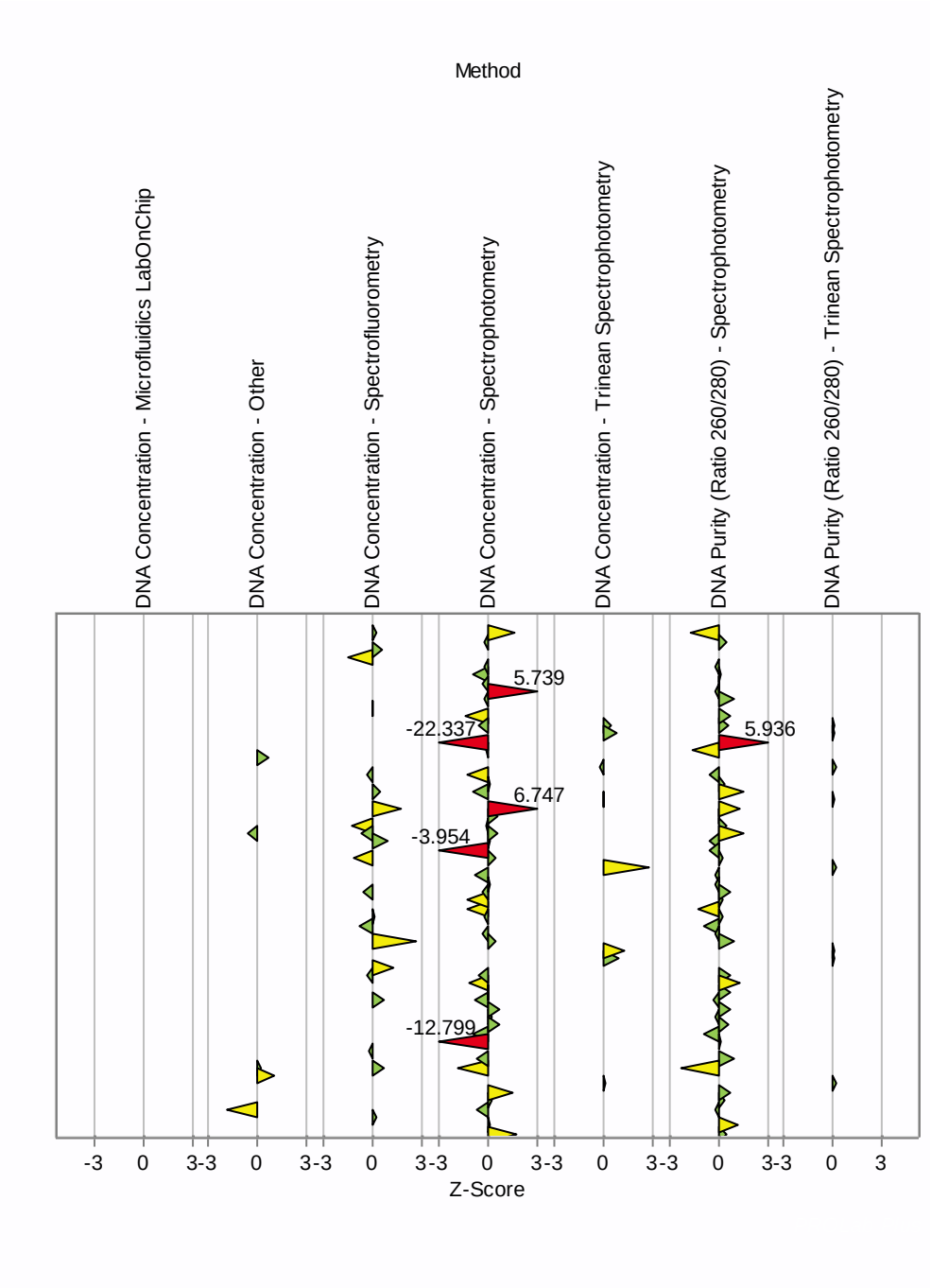
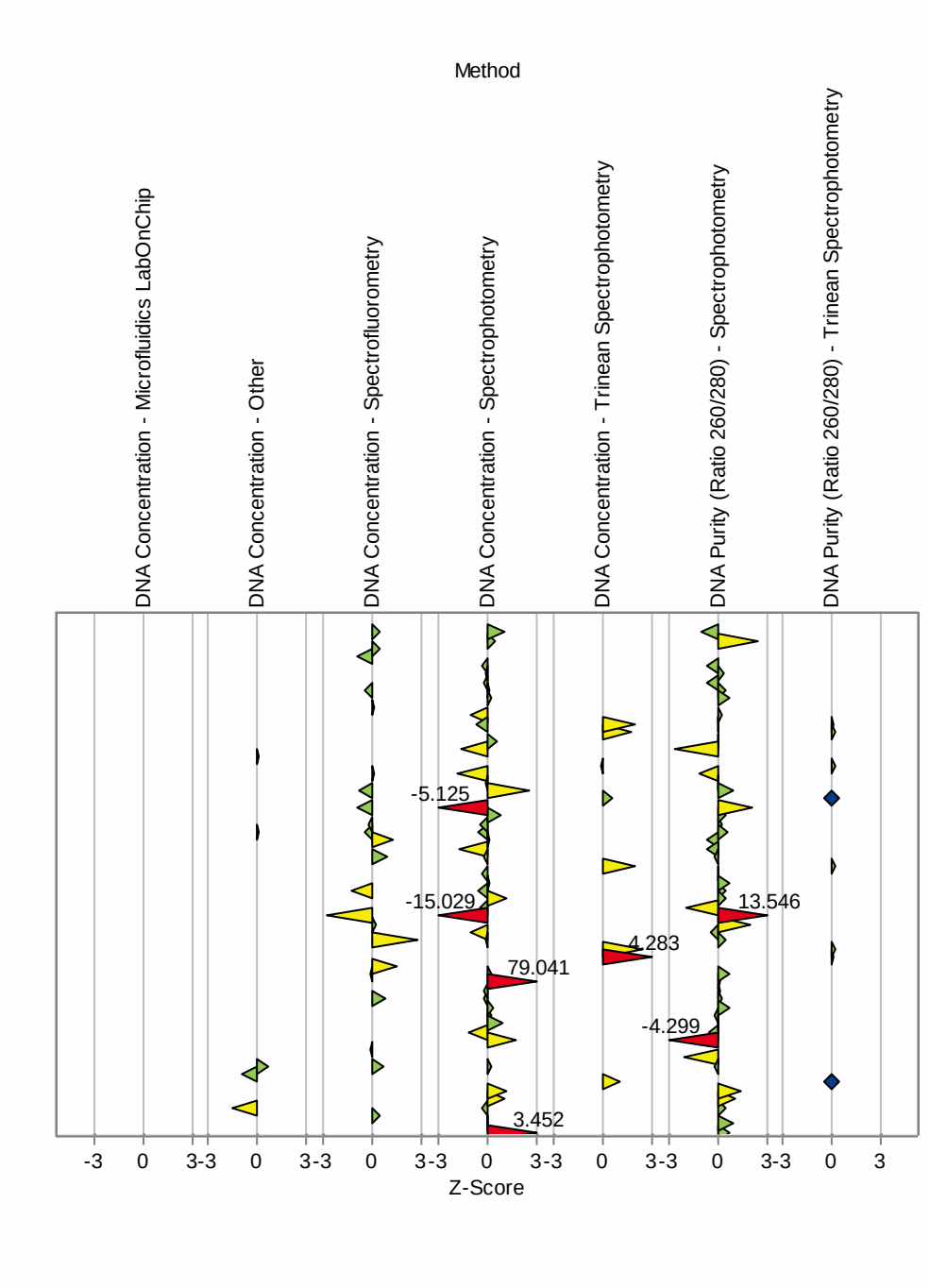
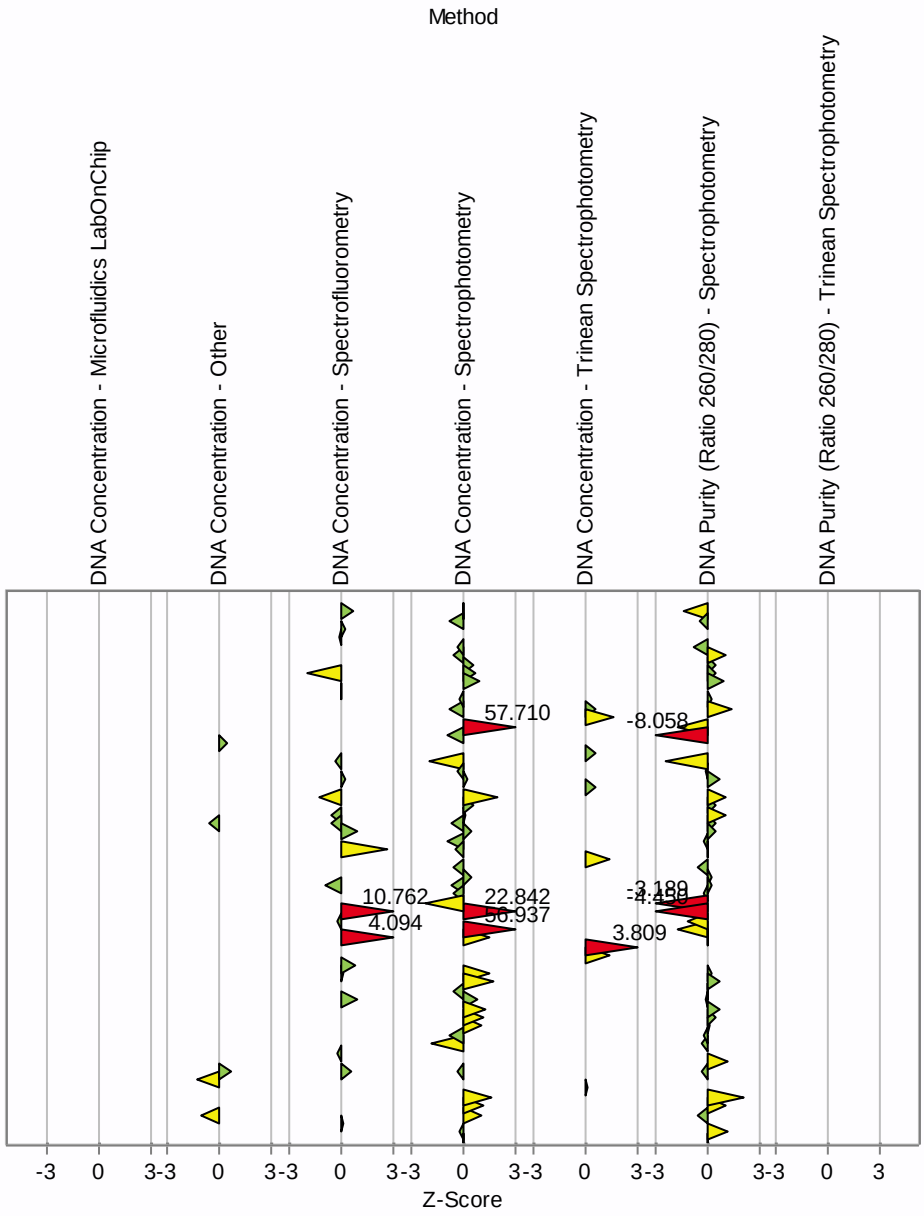
Global DNA Quantification and Purity 2016 Z-Scores For Tube A



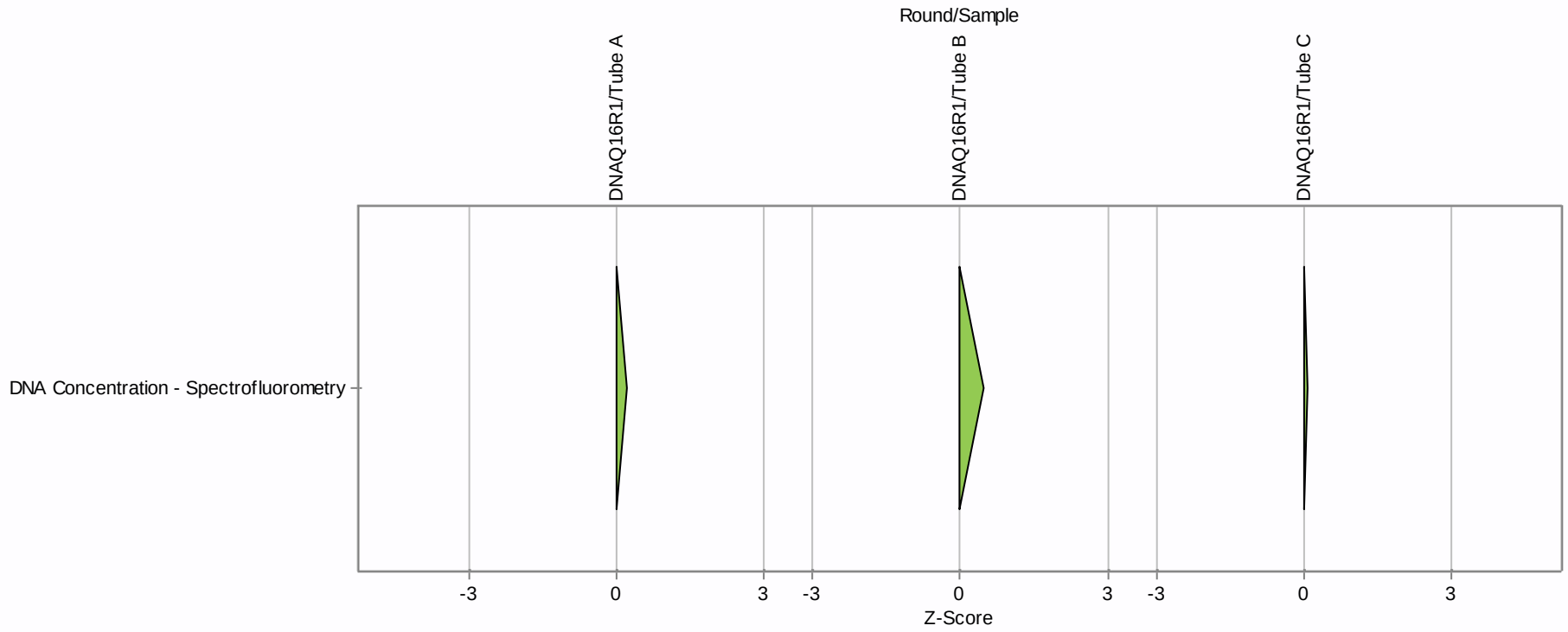
Global DNA Quantification and Purity 2016 Z-Scores For Tube B



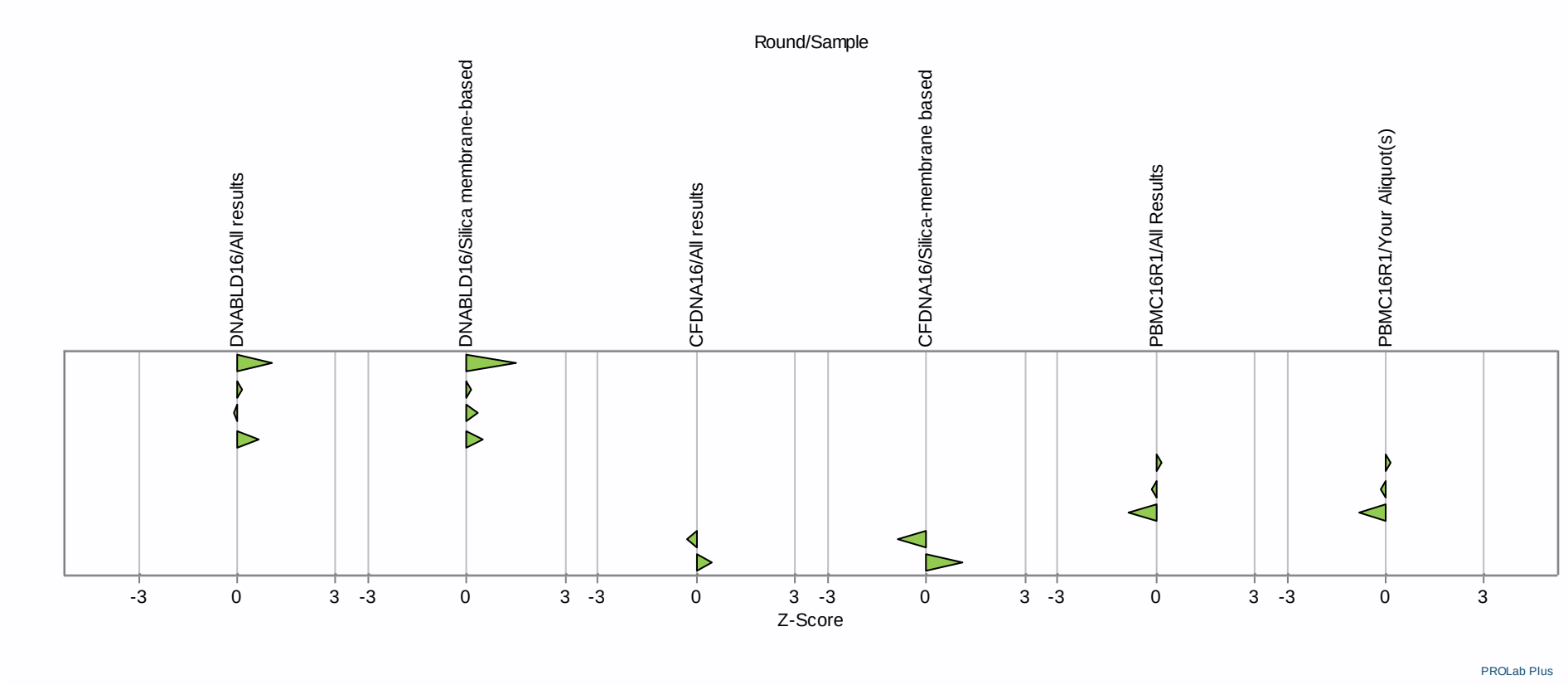
Global DNA Quantification and Purity 2016 Z-Scores For Tube C



Overview Of Your Z-Scores For All Testing Schemes



Overview Of Your Z-Scores For All Processing Schemes



This report has been validated by the PT Coordinator.

Fay BETSOU, PhD HDR, Coordinator