Newborn Screening Quality Assurance Program

2016 UDOT

June 2016

INTRODUCTION

The UDOT proficiency testing challenge is a unique component of the Newborn Screening Quality Assurance Program (NSQAP) utilizing a panel of dried blood spot (DBS) specimens that enter the testing scheme in a manner similar to actual newborn screening specimens. All analytes on a laboratory's test panel must be assayed for each specimen.

METHODS

On April 4, 2016, a panel of 25, blind-coded DBS specimens was distributed to all active UDOT participants. Specimens were enriched with predetermined levels of the following analytes: 17 α-hydroxyprogesterone (17OHP), total galactose (TGal), immunoreactive trypsinogen (IRT), thyroid stimulating hormone (TSH), arginine (Arg), citrulline (Cit), leucine (Leu), methionine (Met), phenylalanine (Phe), succinylacetone (SUAC), tyrosine (Tyr), valine (Val), C3, C4, C5, C5DC, C6, C8, C10, C10:1, C10:2, C14, C14:1, C16, C16OH, C18, C18:1,C18OH. Specimens deficient in the following analytes were also included in the panel: galactose-1-phosphate uridyltransferase (GALT), biotinidase (BIOT), thyroxine (T_4), and low free carnitine (C0(L)).

Most UDOT pools were prepared from whole blood with the hematocrit adjusted to 50% and were enriched with high-purity analytes. The C0(L), BIOT-, and T_4- deficient pools were produced by combining washed, packed red blood cells with heat-treated charcoal-stripped serum to achieve a 50% hematocrit. The GALT/TGal pool was made by adding a 50/50 serum/saline mixture to washed, packed red blood cells until the hematocrit was 50% and then the reconstituted blood was heat-treated to decrease the GALT enzyme activity. The blood pool was then enriched with predetermined levels of TGal (consisting of galactose and galactose-1-phosphate).

All of the blood pools were spotted in 75 µL aliquots onto lot W121 of Whatman 903 filter paper, dried, and stored according to standard practices. [1]

Quarterly publications for colleagues and participants of the
Proficiency Testing Program for UDOT in Dried Blood Spots.

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REPORTS/RESULTS

We processed data from 62 participants. Laboratories were asked to report only results that were "outside normal limits".

Table 1 summarizes the 2016 UDOT specimen certification of expected values (EV) and frequency for outside normal limits. The EV for the majority of analytes was the sum of the base pool (endogenous) plus the predetermined enrichment levels. The C0(L), GALT, and IRT expected values were based on the NSQAP assayed values. Due to higher than expected recovery, the assayed values were used for the specimens: 21608 - 17OHP and 21624 - TSH. The NSQAP BIOT method analysis does not generate quantitative results therefore no EV was reported. The absence of an EV for BIOT was noted on Table 1 and there are no Z-value charts for BIOT specimens. Table 2 contains the summary of participant cutoffs for all 2016 UDOT analytes. Non-certified analytes found by participant laboratories are shown in Table 3.

The individual laboratory results were qualitatively evaluated. The quantitative statistical results were provided for informational purposes. The quantitative statistical reports include: Summary of Reported Cutoff Values, Overall Statistics, Mean Concentration by Method, and Z-value charts.

The Summary of Reported Cutoff Values includes all data for the mean, median, minimum, and maximum values with no outliers removed. In the statistical summary analysis for the Overall Statistics and Mean Concentration by Method reports, data outside two passes of the 99% confidence interval were considered outliers and were removed from the reported statistical results.

The Z-value charts were calculated by using the following calculation:

$$\text{Z-Value} = \frac{\text{Participant Value} - \text{NSQAP Expected Value}}{\text{Overall Participant Standard Deviation}}$$

Note: Z-values were coded for each laboratory. Find your Z-value in the Reviewer's Comments box on your laboratory's evaluation page.

EDUCATIONAL SPECIMENS

Specimen 21624 was certified as "outside normal limits" for T_4 and TSH. The preparation of this specimen also decreased the biotinidase enzyme activity. Biotinidase in this specimen was declared an educational challenge since >80% of participants reported the enzyme as outside normal limits.

Specimen 21604 was not evaluated for arginine. In order for a specimen to be evaluated, it must have >80% consensus among all UDOT participants.

NSQAP appreciates your continued participation in our program. Please contact us at NSQAPDMT@cdc.gov with comments and suggestions.

[1] Mei JV, Alexander JR, Adam BW, Hannon WH. Use of Filter Paper for the Collection and Analysis of Human Whole Blood Specimens. Nutr. 2001 May;131(5):1631S-6S.

Newborn Screening Quality Assurance Program
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Table 1. Specimen Certification & Frequency

Specimen Certification				Labs Reporting	
Specimen	**Analyte**	**Expected Value**	**Units**		**Percent Consensus**
21601	Biotinidase (BIOT)	n/a		45 of 46	97.8%
21601	Low Free Carnitine (C0(L))	4.51^	µmol/L blood	52 of 52	100.0%
21602	Propionylcarnitine (C3)	10.82	µmol/L blood	50 of 50	100.0%
21603	Tiglylcarnitine (C5:1)	0.62	µmol/L blood	42 of 48	87.5%
21603	Hydroxyisovalerylcarnitine (C5OH)	1.74	µmol/L blood	48 of 50	96.0%
21604	Arginine (Arg)	158.1	µmol/L blood	31 of 40	77.5%
21605	Glutarylcarnitine (C5DC)	1.32	µmol/L blood	52 of 52	100.0%
21606	Galactose-1-phosphate Uridyltransferase (GALT)	1.4^	U/g Hb	47 of 47	100.0%
21606	Total Galactose (TGal)	17.6	mg/dL blood	23 of 24	95.8%
21607	Citrulline (Cit)	130.9	µmol/L blood	50 of 50	100.0%
21608	17 α-Hydroxyprogesterone (17OHP)	117.3^	ng/mL serum	48 of 48	100.0%
21609	Succinylacetone (SUAC)	40.5	µmol/L blood	32 of 34	94.1%
21610	Normal				
21611	Methionine (Met)	162.8	µmol/L blood	50 of 50	100.0%
21612	Phenylalanine (Phe)	245.6	µmol/L blood	58 of 59	98.3%
21613	Normal				
21614	Immunoreactive Trypsinogen (IRT)	242.6^	ng/mL blood	48 of 48	100.0%
21615	Butyrylcarnitine (C4)	2.19	µmol/L blood	38 of 45	84.4%
21616	Propionylcarnitine (C3)	10.82	µmol/L blood	50 of 50	100.0%
21617	Decadienoylcarnitine (C10:2)	1.02	µmol/L blood	26 of 31	83.9%
21618	Tetradecenoylcarnitine (C14:1)	1.06	µmol/L blood	47 of 53	88.7%
21619	17 α-Hydroxyprogesterone (17OHP)	50.7	ng/mL serum	46 of 48	95.8%
21620	Isovalerylcarnitine (C5)	1.33	µmol/L blood	50 of 52	96.2%
21621	Hexanoylcarnitine (C6)	2.27	µmol/L blood	48 of 48	100.0%
21621	Octanoylcarnitine (C8)	2.87	µmol/L blood	53 of 53	100.0%
21621	Decanoylcarnitine (C10)	2.33	µmol/L blood	47 of 47	100.0%
21621	Decenoylcarnitine (C10:1)	2.88	µmol/L blood	43 of 43	100.0%
21622	Normal				
21623	Hydroxypalmitoylcarnitine (C16OH)	0.71	µmol/L blood	53 of 53	100.0%
21624	Thyroxine (T_4)	0.0	µg/dL serum	24 of 25	96.0%
21624	Thyroid-Stimulating Hormone (TSH)	103.2^	µIU/mL serum	48 of 49	98.0%
21625	Leucine (Leu)	856.3	µmol/L blood	50 of 51	98.0%
21625	Valine (Val)	659.0	µmol/L blood	34 of 35	97.1%

Educational Sample

21624	*Biotinidase (Bio)*	*n/a*

*Total number of laboratories reporting data per analyte varies.
^ NSQAP assayed value
A gradable specimen must have ≥80% or more agreement among laboratories.
All certified MS/MS expected values are derivatized.
Expected Value = Sum of endogenous and enrichment values

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Table 2. Summary of Reported Cutoff Values

Analyte	N	Mean	Median	Min	Max	Units
T_4	23	6.0	6.0	4.0	8.3	µg/dL serum
TSH	47	30.6	26.6	18.0	58.0	µIU/mL serum
TGal	21	10.9	10.0	6.0	20.0	mg/dL blood
17OHP	45	32.9	32.0	7.0	65.0	ng/mL serum
GALT1	21	3.2	3.1	1.5	5.0	U/g Hb
GALT2	11	3.6	3.5	2.0	5.5	U/dL blood
IRT	35	67.0	60.0	26.3	139.5	ng/mL blood
BIOT1	3	50.0	48.0	45.0	57.0	nmol/min/dL
BIOT2	9	11.3	10.0	10.0	16.0	ERU*
BIOT3	9	52.0	55.0	14.8	80.0	U/dL blood
BIOT4	5	25.5	27.0	13.4	36.0	MRU**
Arg	31	73.5	70.0	20.0	120.0	µmol/L blood
Cit	49	54.7	55.0	18.0	100.0	µmol/L blood
Leu	50	289.5	281.0	175.0	450.0	µmol/L blood
Met	50	74.4	70.0	35.0	100.0	µmol/L blood
Phe	58	142.3	140.0	86.0	204.0	µmol/L blood
SUAC	35	2.8	2.0	0.5	7.0	µmol/L blood
Val	34	291.4	274.0	190.0	530.0	µmol/L blood
C0(L)	52	8.66	8.00	5.00	33.00	µmol/L blood
C3	51	5.91	6.00	2.82	9.00	µmol/L blood
C4	39	1.20	1.20	0.63	1.90	µmol/L blood
C5	51	0.67	0.60	0.38	1.20	µmol/L blood
C5:1	43	0.16	0.15	0.02	0.38	µmol/L blood
C5DC	53	0.36	0.32	0.12	0.80	µmol/L blood
C5OH	49	0.79	0.80	0.25	1.36	µmol/L blood
C6	48	0.37	0.25	0.12	0.95	µmol/L blood
C8	53	0.44	0.40	0.24	0.73	µmol/L blood
C10	47	0.44	0.40	0.22	0.80	µmol/L blood
C10:1	42	0.28	0.25	0.13	0.45	µmol/L blood
C10:2	26	0.15	0.12	0.04	0.50	µmol/L blood
C14:1	46	0.61	0.65	0.21	0.80	µmol/L blood
C16OH	53	0.12	0.11	0.04	0.25	µmol/L blood

*ERU - Enzyme Response Units

**MRU - Microplate Response Units

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Table 3. Non-Certified Analytes Reported

Specimen	Certified Analyte	Non-Certified Not Expected Analyte(s)
21601	BIOT, C0(L)	GALT (3)
21602	C3	C3DC+C4OH (1), C5OH (10), GALT (2), Leu (1)
21603	C5:1, C5OH	BIOT (2), C3DC+C4OH (1), C5OH (1), Leu (1)
21604	Arg	BIOT (1)
21605	C5DC	BIOT (4)
21606	GALT, TGal	BIOT (7), C5OH (2)
21607	Cit	BIOT (1)
21608	17OHP	C5OH (2), Cit (18)
21609	SUAC	C5OH (1)
21610	*normal*	TGal (1)
21611	Met	C5OH (2)
21612	Phe	C5OH (1)
21613	*normal*	BIOT (1)
21614	IRT	BIOT (1), C3DC+C4OH (1), C5OH (10), GALT (2), Leu (2), Val (1)
21615	C4	C5OH (3)
21616	C3	C3DC+C4OH (1), C5OH (14), GALT (2), Leu (2)
21617	C10:2	BIOT (1), C10:1 (1), C5OH (1)
21618	C14:1	BIOT (1), C5OH (3)
21619	17OHP	C0(L) (1), C5OH (3), Cit (12), Val (1)
21620	C5	BIOT (18)
21621	C6, C8, C10, C10:1	C5OH (2)
21622	*normal*	C5OH (1)
21623	C16OH	BIOT (12)
21624	T4, TSH, BIOT	C5OH (4)
21625	Leu, Val	C5OH (2)

The number in parentheses shows how many labs reported the analyte as outside-normal-limits.

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Overall Statistics

Specimen	21601	21601	21601	21601	21601	21602	21603
Analyte	BIOT1	BIOT2	BIOT3	BIOT4	C0(L)	C3	C5:1
Unit of Measure	nmol/min/dL	ERU	U/dL blood	MRU	µmol/L blood	µmol/L blood	µmol/L blood
N**	3	9	3	5	49	47	41
Outliers	0	0	0	0	3	3	1
Mean	22.0	2.8	8.4	2.1	4.26	9.24	0.44
SD	---*	2.3	---*	1.1	0.94	0.82	0.08

Specimen	21603	21604	21605	21606	21606	21606	21607
Analyte	C5OH	Arg	C5DC	GALT1	GALT3	TGal	Cit
Unit of Measure	µmol/L blood	µmol/L blood	µmol/L blood	U/g Hb	U/dL blood	mg/dL blood	µmol/L blood
N**	47	29	52	17	5	22	47
Outliers	2	1	0	0	0	0	1
Mean	1.16	113.7	1.12	1.1	0.5	18.9	105.7
SD	0.16	28.4	0.40	0.4	1.1	3.5	17.4

Specimen	21608	21609	21611	21612	21614	21615	21616
Analyte	17OHP	SUAC	Met	Phe	IRT	C4	C3
Unit of Measure	ng/mL serum	µmol/L blood	µmol/L blood	µmol/L blood	ng/mL blood	µmol/L blood	µmol/L blood
N**	44	30	47	55	35	37	49
Outliers	0	3	2	2	0	1	1
Mean	124.0	13.8	145.3	209.0	249.5	1.64	9.26
SD	13.7	5.0	14.4	21.6	22.3	0.18	1.02

Specimen	21617	21618	21619	21620	21621	21621	21621
Analyte	C10:2	C14:1	17OHP	C5	C6	C8	C10
Unit of Measure	µmol/L blood	µmol/L blood	ng/mL serum	µmol/L blood	µmol/L blood	µmol/L blood	µmol/L blood
N**	25	45	42	48	46	51	45
Outliers	1	0	0	2	1	1	1
Mean	0.66	0.88	59.0	1.12	2.08	2.84	2.28
SD	0.16	0.14	5.7	0.14	0.22	0.30	0.36

* Standard deviation (SD) was not included for N≤3

*** Values outside the 99% CI (outliers) were excluded from the calculations.*

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2016 UDOT Proficiency Testing Panel

Overall Statistics

Specimen	21621	21623	21624	21624	21625	21625
Analyte	C10:1	C16OH	T_4	TSH	Leu	Val
Unit of Measure	µmol/L blood	µmol/L blood	µg/dL serum	µIU/mL serum	µmol/L blood	µmol/L blood
N**	38	49	14	46	47	31
Outliers	3	3	1	0	2	2
Mean	2.48	0.46	0.2	105.3	766.5	546.4
SD	0.38	0.08	0.1	9.5	63.6	72.6

* Standard deviation (SD) was not included for N≤3

*** Values outside the 99% CI (outliers) were excluded from the calculations.*

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2016 UDOT Proficiency Testing Panel

Mean Concentration by Method

Specimen No. 21601		BIOT1		
		Expected Value N/A nmol/min/dL blood		
		N	Mean	SD
Method Code	Method Name			
09	PerkinElmer Neonatal Kit	3	22.0	---*

Specimen No. 21601		BIOT2		
		Expected Value N/A ERU		
		N	Mean	SD
Method Code	Method Name			
34	Astoria-Pacific 50 Hour Reagen	9	2.8	2.3

Specimen No. 21601		BIOT3		
		Expected Value N/A U/dL blood		
		N	Mean	SD
Method Code	Method Name			
62	PerkinElmer GSP Neonatal	3	8.4	---*

Specimen No. 21601		BIOT4		
		Expected Value N/A MRU		
		N	Mean	SD
Method Code	Method Name			
64	Astoria-Pacific Neonatal Micro	4	2.4	1.0

* SD was not included for N ≤ 3.

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Mean Concentration by Method

Specimen No. 21601		C0(L)		
		Assayed Value 4.51 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	20	4.56	1.06
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	5.78	1.06
60	Non-deriv MS/MS PE NeoBase Kit	23	3.80	0.50

Specimen No. 21602		C3		
		Expected Value 10.82 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	19	9.90	1.30
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	8.44	0.58
60	Non-deriv MS/MS PE NeoBase Kit	23	9.18	0.60

Specimen No. 21603		C5:1		
		Expected Value 0.62 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	19	0.46	0.08
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	0.36	0.06
60	Non-deriv MS/MS PE NeoBase Kit	15	0.42	0.04

* SD was not included for N ≤ 3.

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Mean Concentration by Method

Specimen No. 21603		C5OH		
		Expected Value 1.74 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	19	1.26	0.18
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	1.16	0.14
60	Non-deriv MS/MS PE NeoBase Kit	22	1.06	0.10

Specimen No. 21604		Arg		
		Expected Value 158.1 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	9	85.0	46.3
35	Deriv-MS/MS PE NeoGram MS2 Kit	4	110.0	21.6
60	Non-deriv MS/MS PE NeoBase Kit	17	124.7	11.1

Specimen No. 21605		C5DC		
		Expected Value 1.32 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	21	0.68	0.24
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	1.28	0.10
60	Non-deriv MS/MS PE NeoBase Kit	23	1.42	0.14

* SD was not included for N ≤ 3.

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Mean Concentration by Method

Specimen No. 21606		GALT1		
		Assayed Value 1.4 U/g Hb		
		N	Mean	SD
Method Code	Method Name			
09	PerkinElmer Neonatal Kit	12	1.2	0.4
64	Astoria-Pacific Neonatal Micro	4	0.8	0.3

Specimen No. 21606		GALT2		
		Expected Value N/Aμmol/L blood		
		N	Mean	SD
Method Code	Method Name			
34	Astoria-Pacific 50 Hour Reagen	2	16.7	---*

Specimen No. 21606		GALT3		
		Expected Value N/A U/dL blood		
		N	Mean	SD
Method Code	Method Name			
62	PerkinElmer GSP Neonatal	5	0.5	1.1

Specimen No. 21606		TGal		
		Expected Value 17.6 mg/dL blood		
		N	Mean	SD
Method Code	Method Name			
09	PerkinElmer Neonatal Kit	4	17.0	1.7
19	Other	2	20.0	---*
34	Astoria-Pacific 50 Hour Reagen	5	20.5	2.1

(Continued)

* SD was not included for N ≤ 3.

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Mean Concentration by Method

Specimen No. 21606		TGal		
		Expected Value 17.6 mg/dL blood		
		N	Mean	SD
Method Code	Method Name			
47	Fluorometric Manual	3	15.5	---*
62	PerkinElmer GSP Neonatal	6	18.3	2.8

Specimen No. 21607		Cit		
		Expected Value 130.9 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	19	90.1	21.6
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	110.8	10.1
38	Non-deriv MS/MS non-kit	2	104.5	---*
60	Non-deriv MS/MS PE NeoBase Kit	21	115.7	6.5

Specimen No. 21608		17OHP		
		Assayed Value 117.3 ng/mL serum		
		N	Mean	SD
Method Code	Method Name			
19	Other	4	127.5	24.9
21	AutoDelfia	6	128.5	9.2
58	AutoDelfia Neonatal 17-OHP (B0	15	128.6	15.1
62	PerkinElmer GSP Neonatal	19	118.2	8.9

* SD was not included for N ≤ 3.

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Mean Concentration by Method

Specimen No. 21609		SUAC		
		Expected Value 40.5 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	14	25.0	14.5
60	Non-deriv MS/MS PE NeoBase Kit	17	11.3	1.5

Specimen No. 21611		Met		
		Expected Value 162.8 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	18	144.6	13.7
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	143.2	17.0
60	Non-deriv MS/MS PE NeoBase Kit	22	147.9	13.3

Specimen No. 21612		Phe		
		Expected Value 245.6 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
19	Other	2	258.0	---*
22	Deriv-MS/MS non-kit	23	206.6	29.6
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	217.5	14.7
38	Non-deriv MS/MS non-kit	2	205.5	---*
60	Non-deriv MS/MS PE NeoBase Kit	23	213.3	18.8

* SD was not included for N ≤ 3.

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Mean Concentration by Method

Specimen No. 21614		IRT		
		Assayed Value 242.6 ng/mL blood		
		N	Mean	SD
Method Code	Method Name			
21	AutoDelfia	22	242.3	23.7
62	PerkinElmer GSP Neonatal	13	261.6	12.9

Specimen No. 21615		C4		
		Expected Value 2.19 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	16	1.70	0.20
35	Deriv-MS/MS PE NeoGram MS2 Kit	5	1.40	0.16
60	Non-deriv MS/MS PE NeoBase Kit	15	1.64	0.12

Specimen No. 21616		C3		
		Expected Value 10.82 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	20	9.64	1.44
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	8.38	0.62
60	Non-deriv MS/MS PE NeoBase Kit	23	9.26	0.78

* SD was not included for N ≤ 3.

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Mean Concentration by Method

Specimen No. 21617		C10:2		
		Expected Value 1.02 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	13	0.78	0.14
35	Deriv-MS/MS PE NeoGram MS2 Kit	5	0.66	0.04
60	Non-deriv MS/MS PE NeoBase Kit	6	0.48	0.04

Specimen No. 21618		C14:1		
		Expected Value 1.06 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	22	0.92	0.14
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	0.96	0.14
60	Non-deriv MS/MS PE NeoBase Kit	16	0.82	0.08

Specimen No. 21619		17OHP		
		Expected Value 50.7 ng/mL serum		
		N	Mean	SD
Method Code	Method Name			
19	Other	4	59.6	7.5
21	AutoDelfia	6	61.0	4.4
58	AutoDelfia Neonatal 17-OHP (B0	15	59.9	6.7
62	PerkinElmer GSP Neonatal	17	57.4	4.7

* SD was not included for N ≤ 3.

NEWBORN SCREENING QUALITY ASSURANCE PROGRAM

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Mean Concentration by Method

Specimen No. 21620		C5		
		Expected Value 1.33 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	21	1.16	0.16
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	0.96	0.16
60	Non-deriv MS/MS PE NeoBase Kit	20	1.12	0.10

Specimen No. 21621		C6		
		Expected Value 2.27 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	19	2.02	0.30
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	2.10	0.22
60	Non-deriv MS/MS PE NeoBase Kit	20	2.16	0.12

Specimen No. 21621		C8		
		Expected Value 2.87 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	22	2.92	0.44
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	2.74	0.32
60	Non-deriv MS/MS PE NeoBase Kit	22	2.84	0.14

* SD was not included for N ≤ 3.

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Mean Concentration by Method

Specimen No. 21621		C10		
		Expected Value 2.33 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	19	2.54	0.42
35	Deriv-MS/MS PE NeoGram MS2 Kit	5	1.72	0.16
60	Non-deriv MS/MS PE NeoBase Kit	20	2.20	0.14

Specimen No. 21621		C10:1		
		Expected Value 2.88 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	17	3.08	0.56
35	Deriv-MS/MS PE NeoGram MS2 Kit	5	2.22	0.24
60	Non-deriv MS/MS PE NeoBase Kit	18	2.26	0.20

Specimen No. 21623		C16OH		
		Expected Value 0.71 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	22	0.54	0.10
35	Deriv-MS/MS PE NeoGram MS2 Kit	6	0.44	0.10
60	Non-deriv MS/MS PE NeoBase Kit	23	0.40	0.04

* SD was not included for N ≤ 3.

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Mean Concentration by Method

Specimen No. 21624		T_4		
		Expected Value 0.0 µg/dL serum		
		N	Mean	SD
Method Code	Method Name			
21	AutoDelfia	6	0.3	0.2
62	PerkinElmer GSP Neonatal	8	0.3	0.5

Specimen No. 21624		TSH		
		Assayed Value 103.2 µIU/mL serum		
		N	Mean	SD
Method Code	Method Name			
21	AutoDelfia	26	105.5	10.1
62	PerkinElmer GSP Neonatal	19	106.2	7.3

Specimen No. 21625		Leu		
		Expected Value 856.3 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	20	726.7	77.9
35	Deriv-MS/MS PE NeoGram MS2 Kit	5	774.1	64.5
38	Non-deriv MS/MS non-kit	2	646.6	---*
60	Non-deriv MS/MS PE NeoBase Kit	22	792.7	51.5

* SD was not included for N ≤ 3.

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Mean Concentration by Method

Specimen No. 21625		Val		
		Expected Value 659.0 µmol/L blood		
		N	Mean	SD
Method Code	Method Name			
22	Deriv-MS/MS non-kit	15	545.2	58.5
35	Deriv-MS/MS PE NeoGram MS2 Kit	5	480.9	30.3
60	Non-deriv MS/MS PE NeoBase Kit	12	627.3	106.0

* SD was not included for N ≤ 3.

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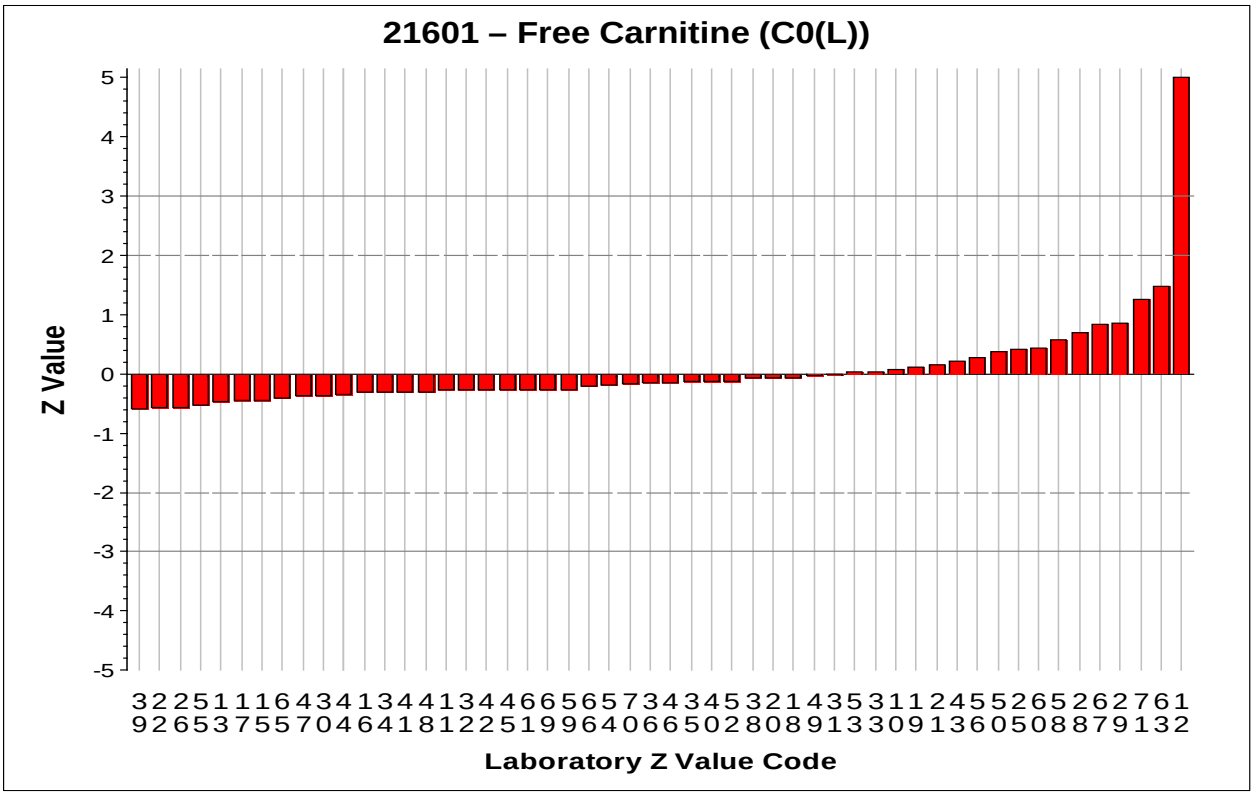
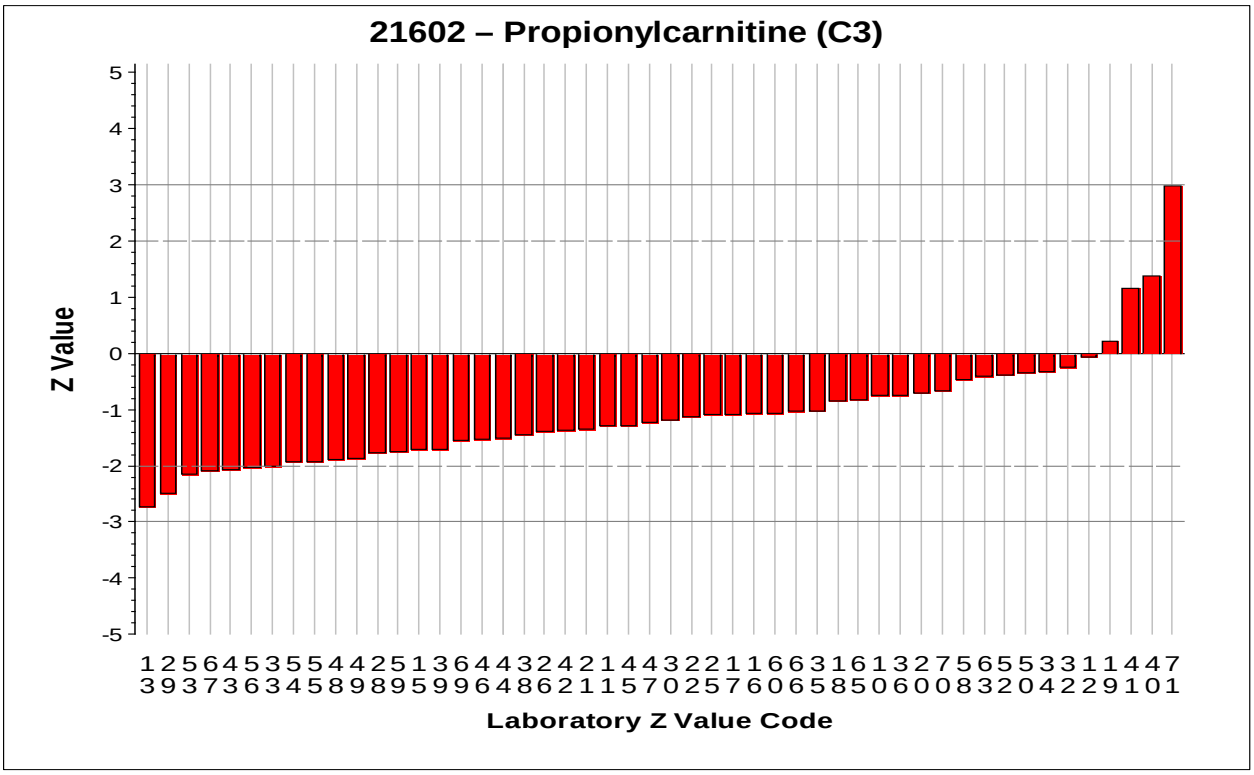
Z Values





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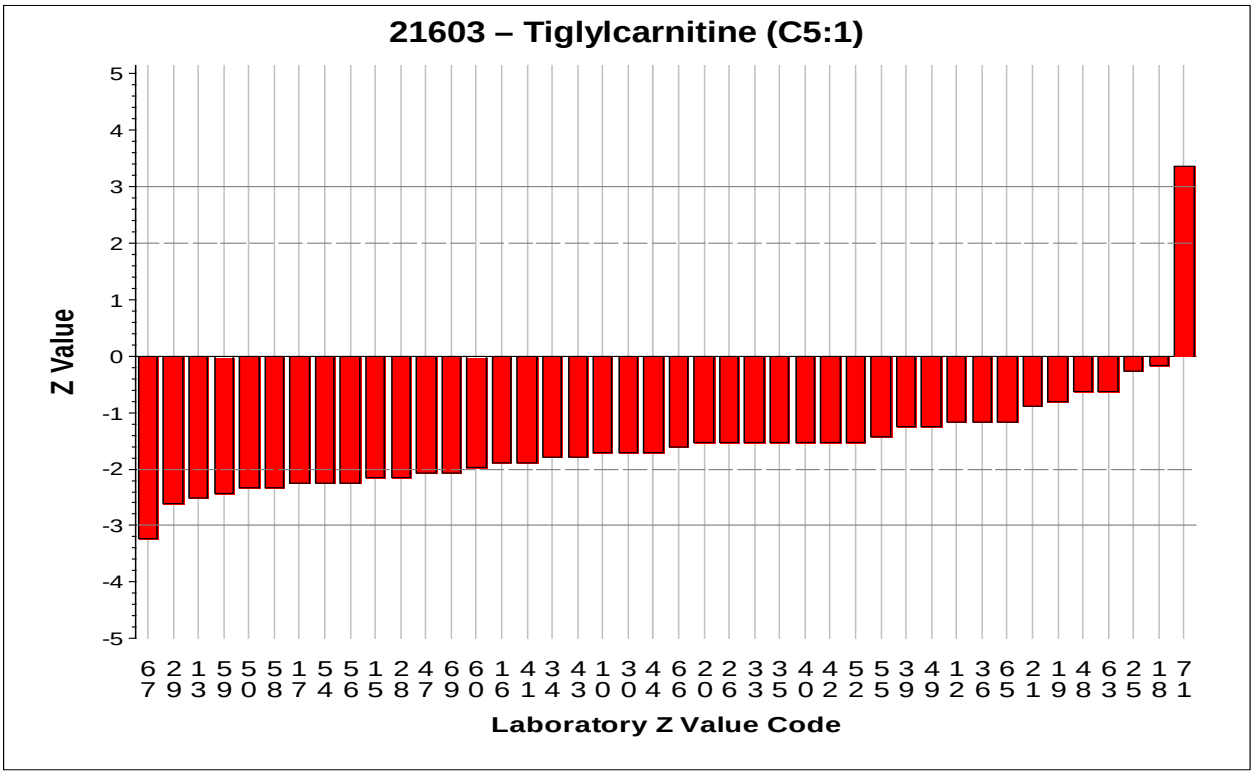
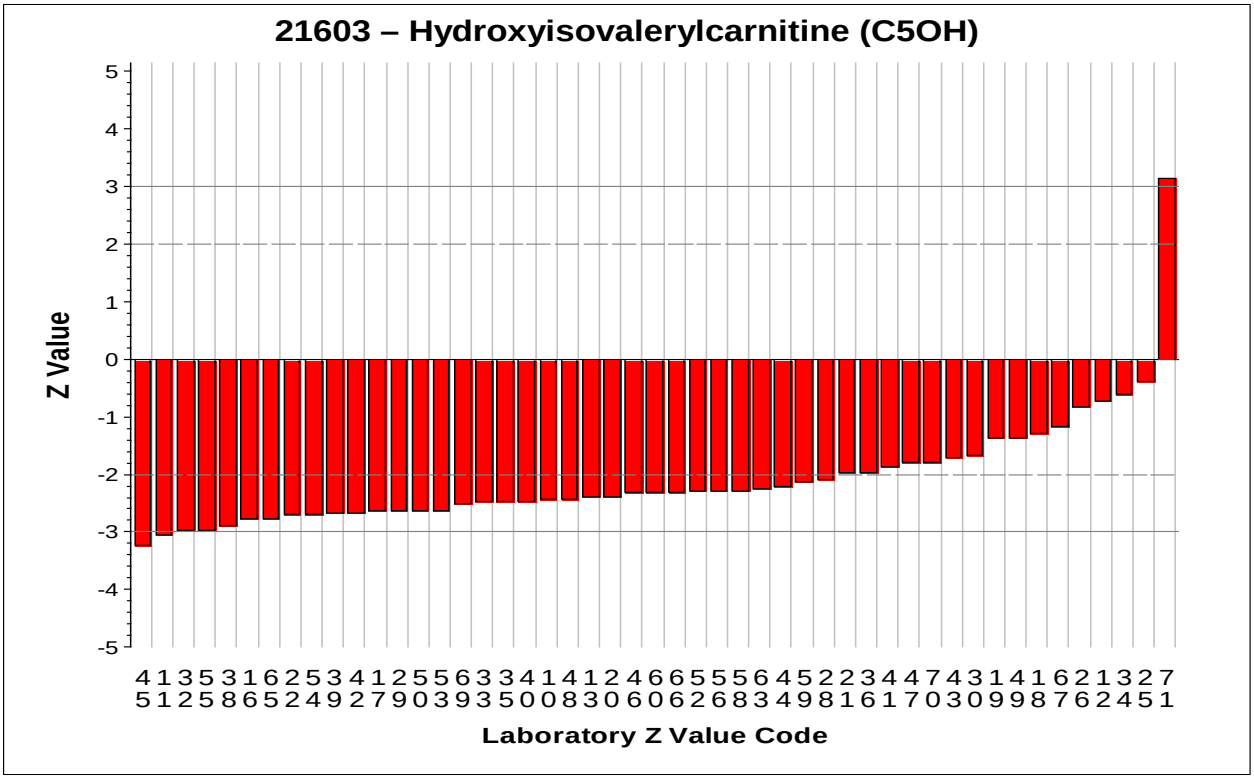
Z Values





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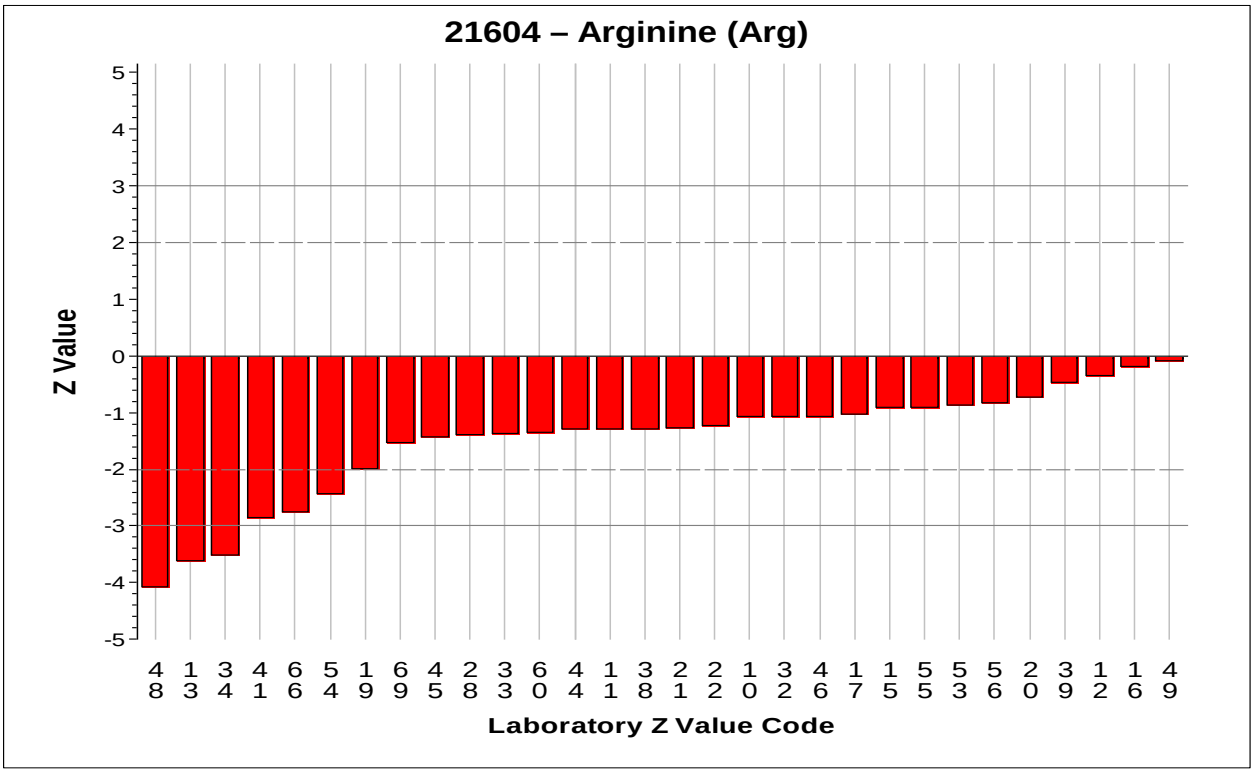

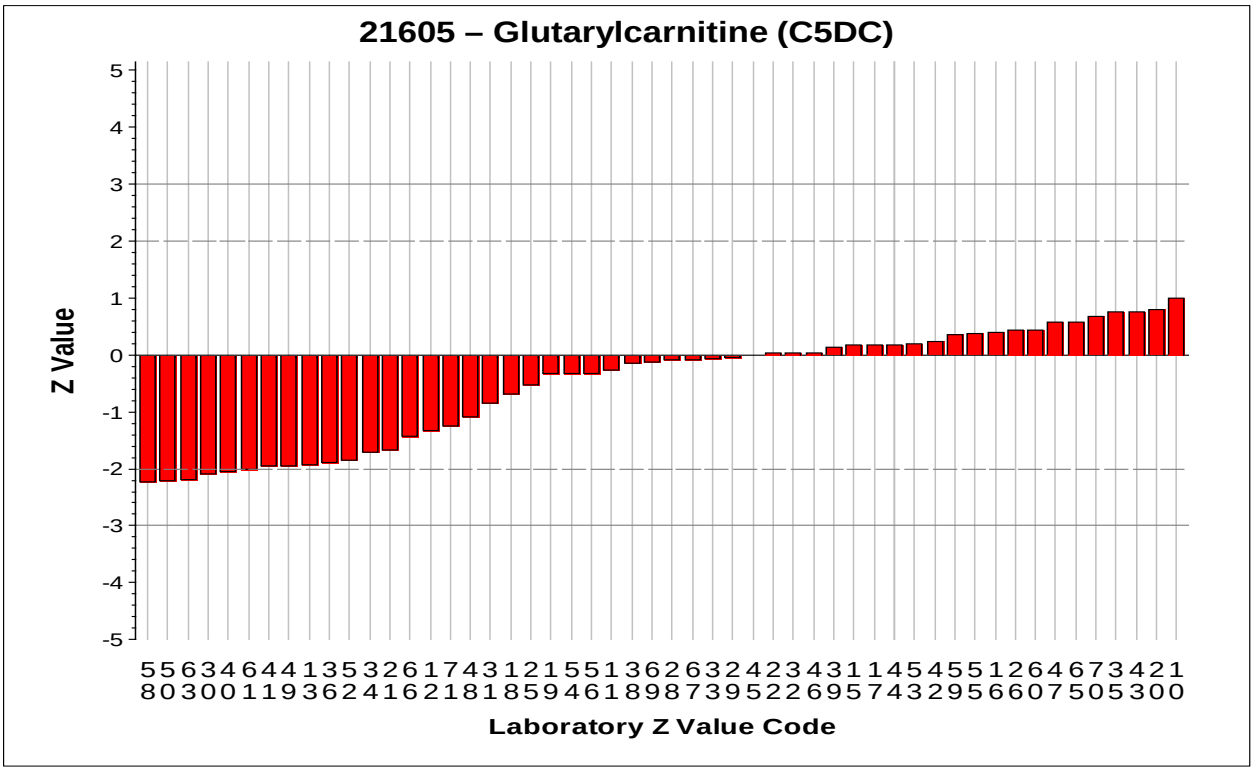

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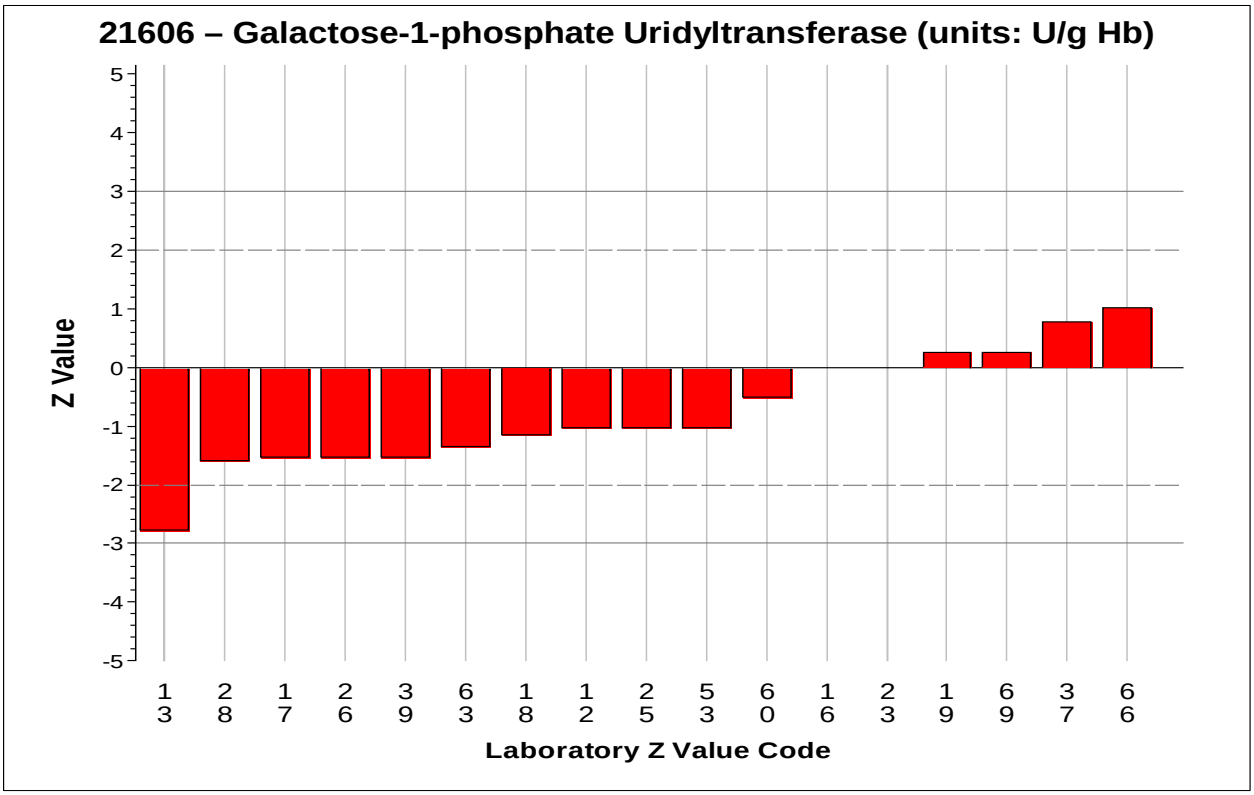

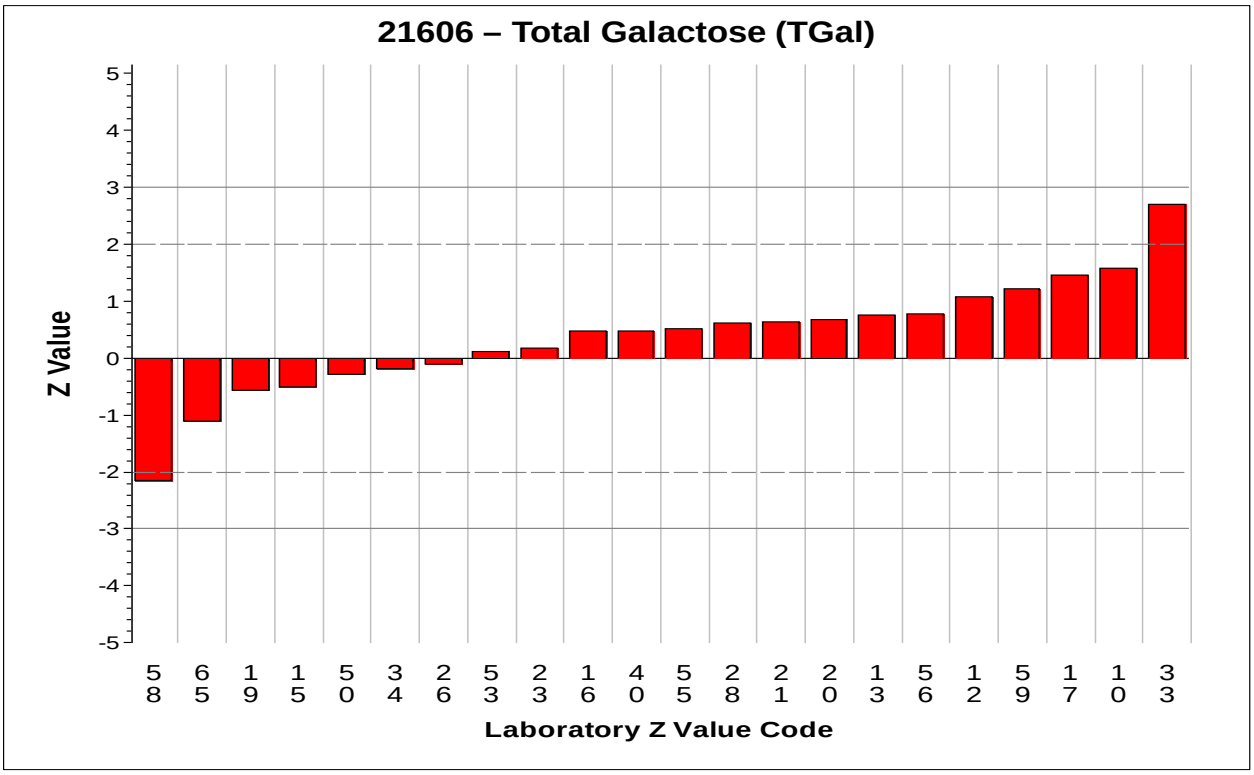

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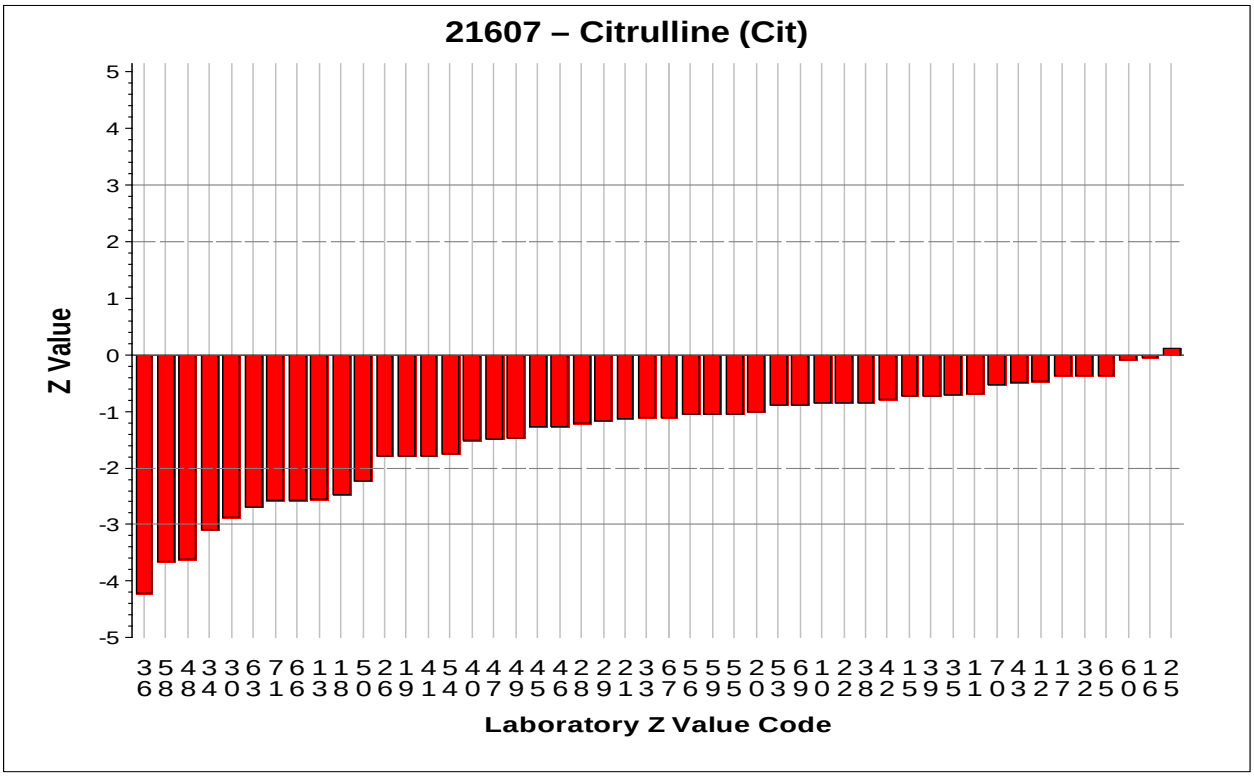

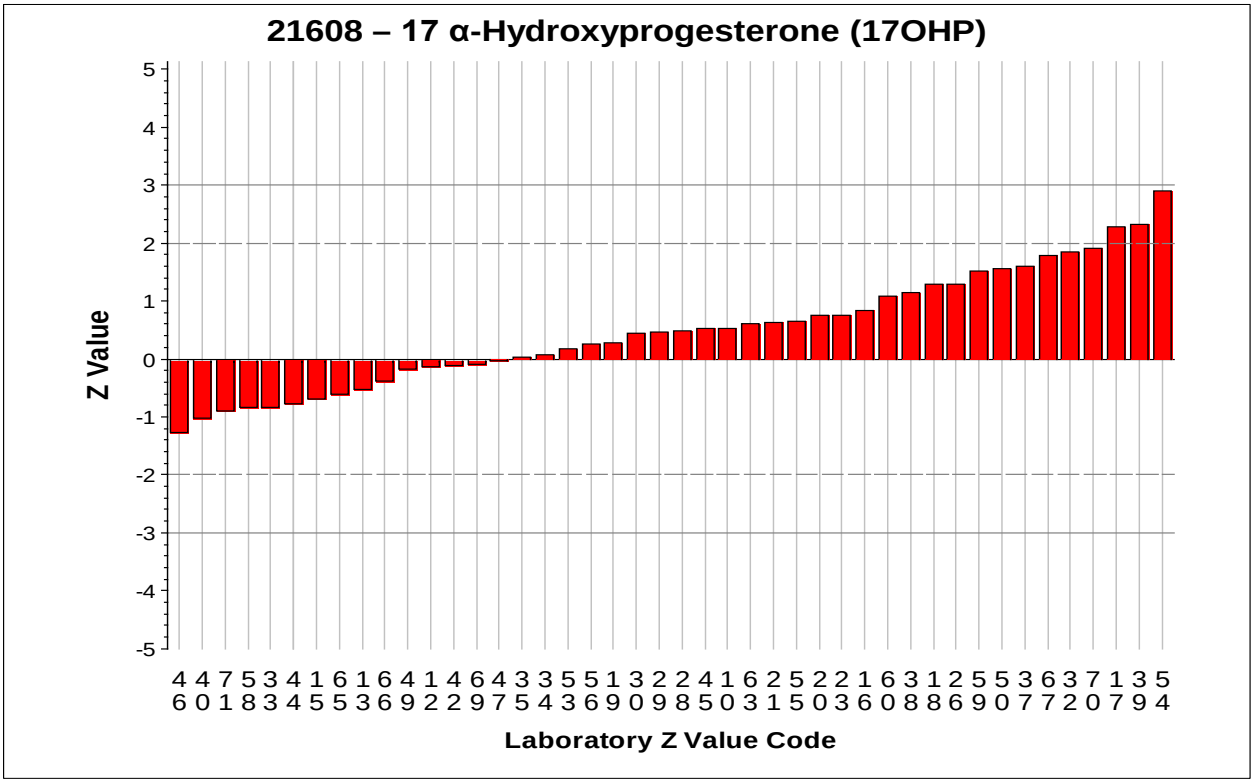

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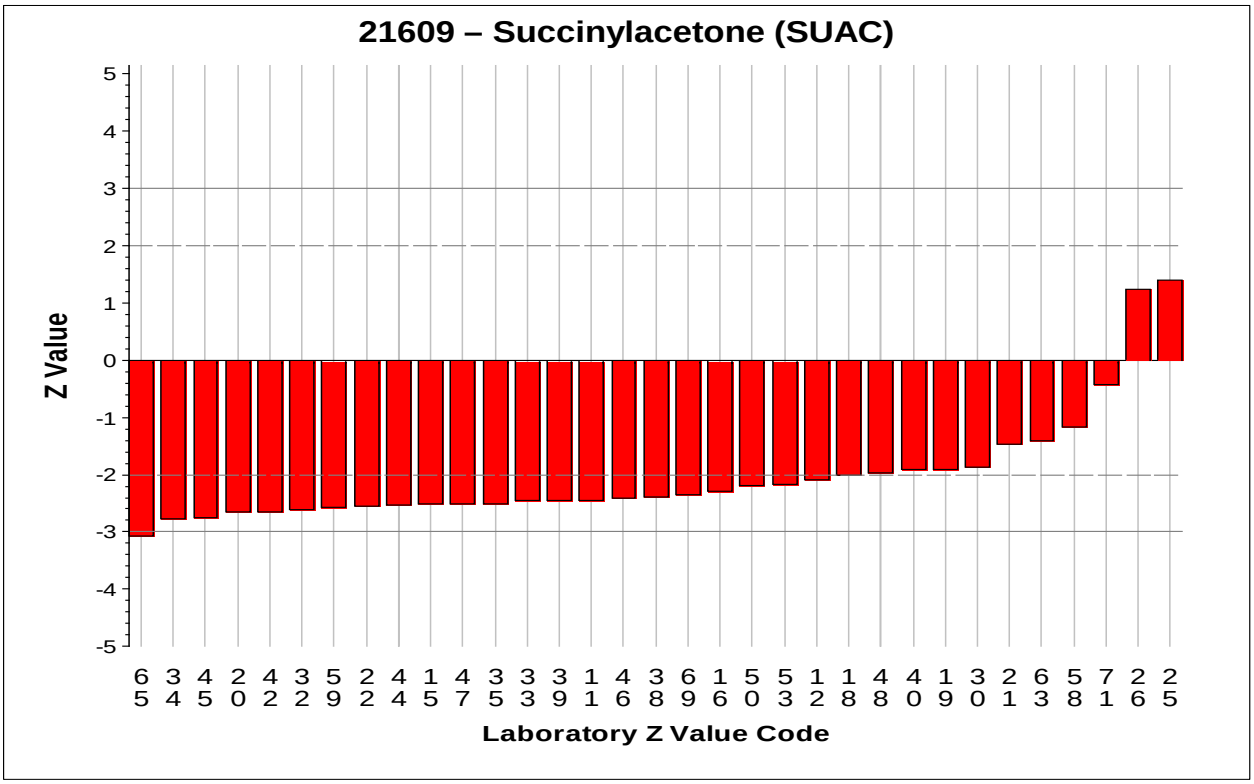

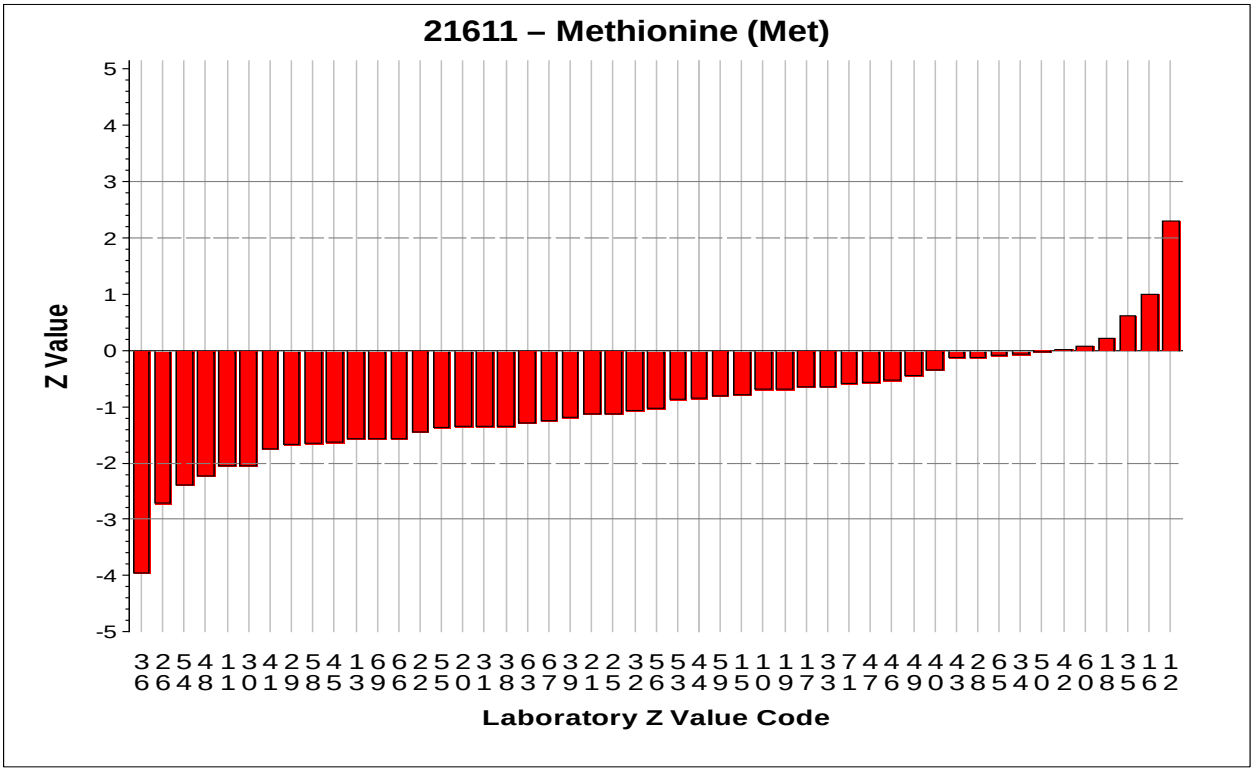

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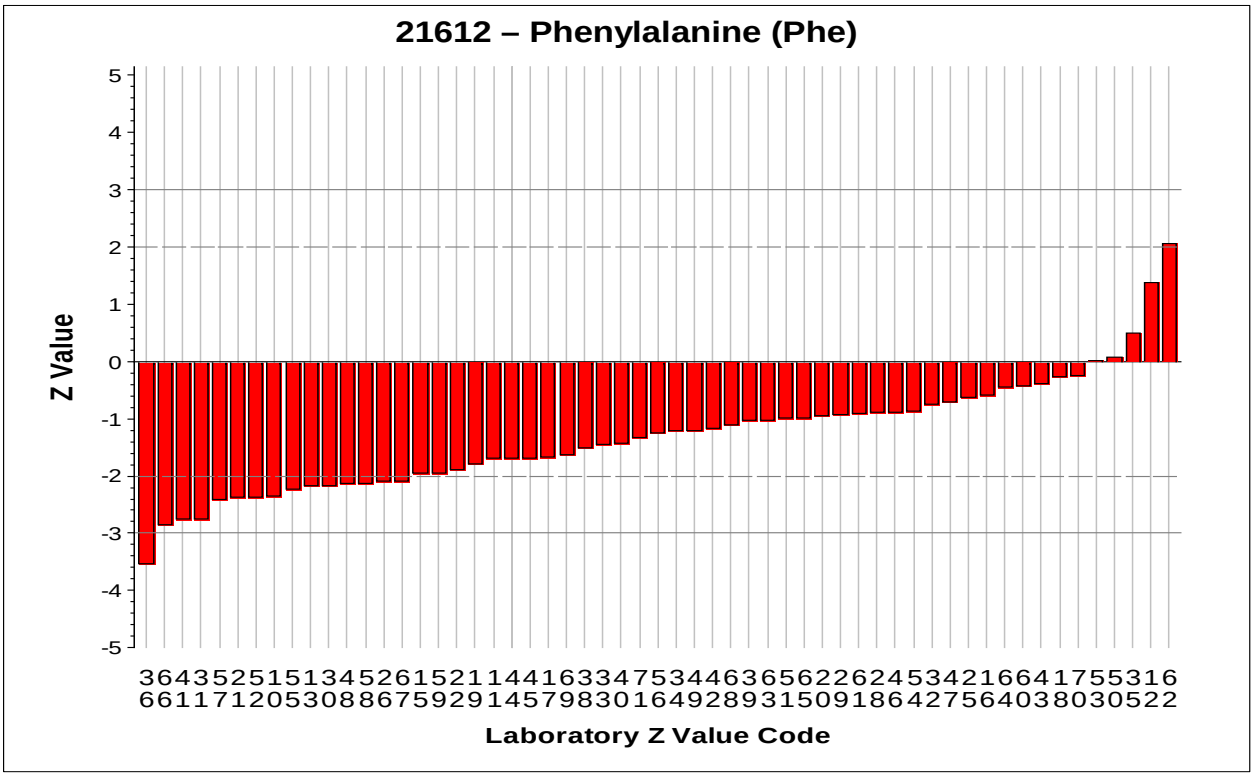

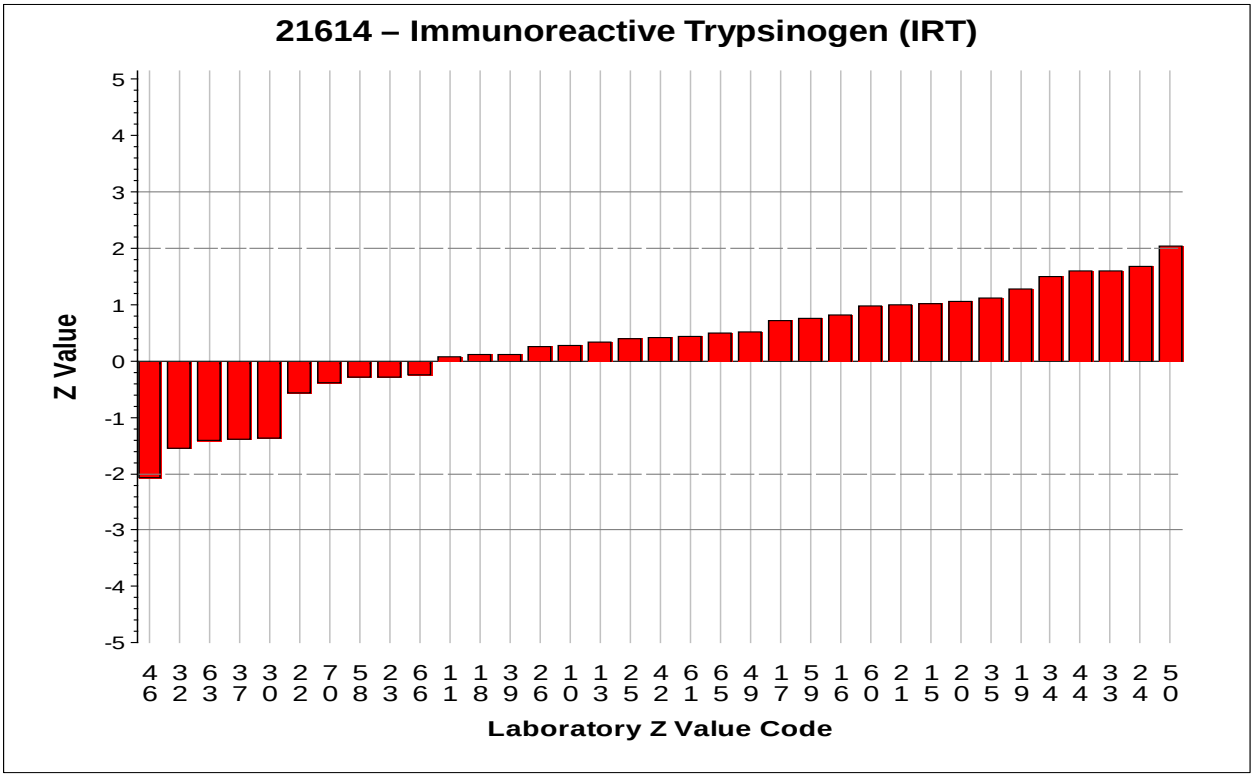

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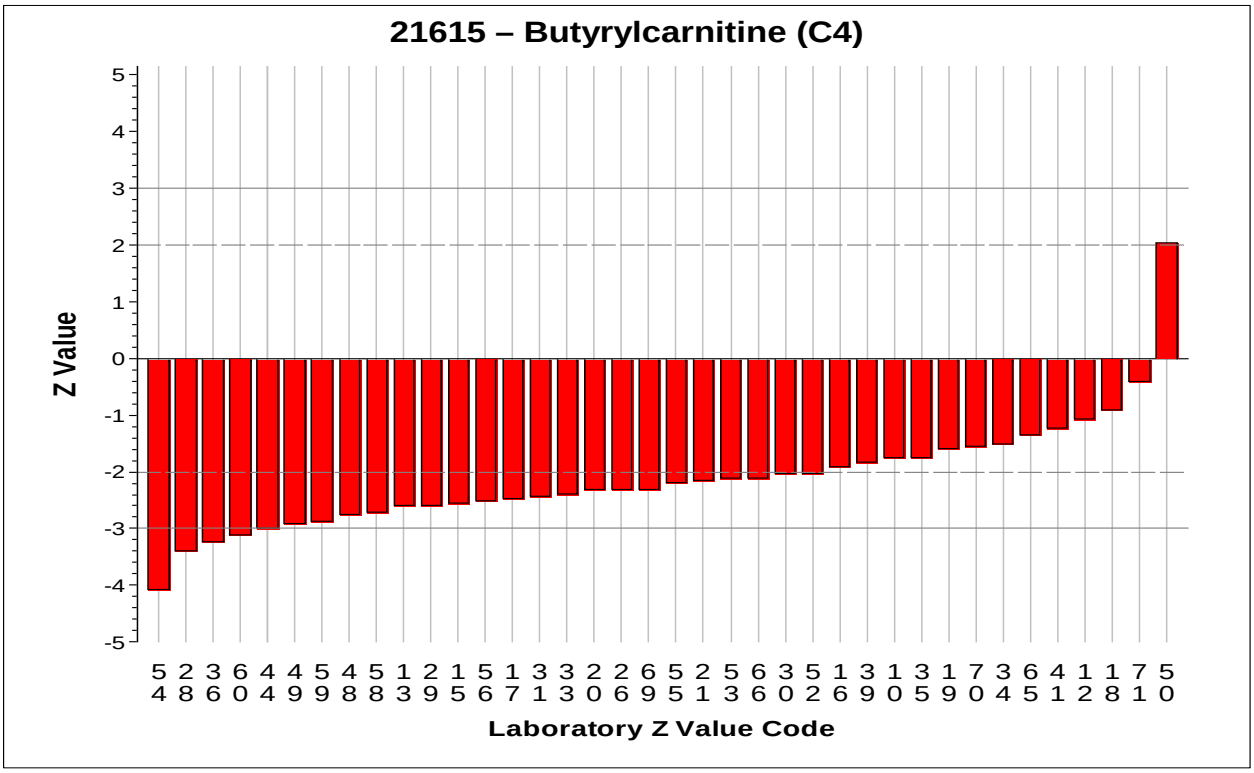

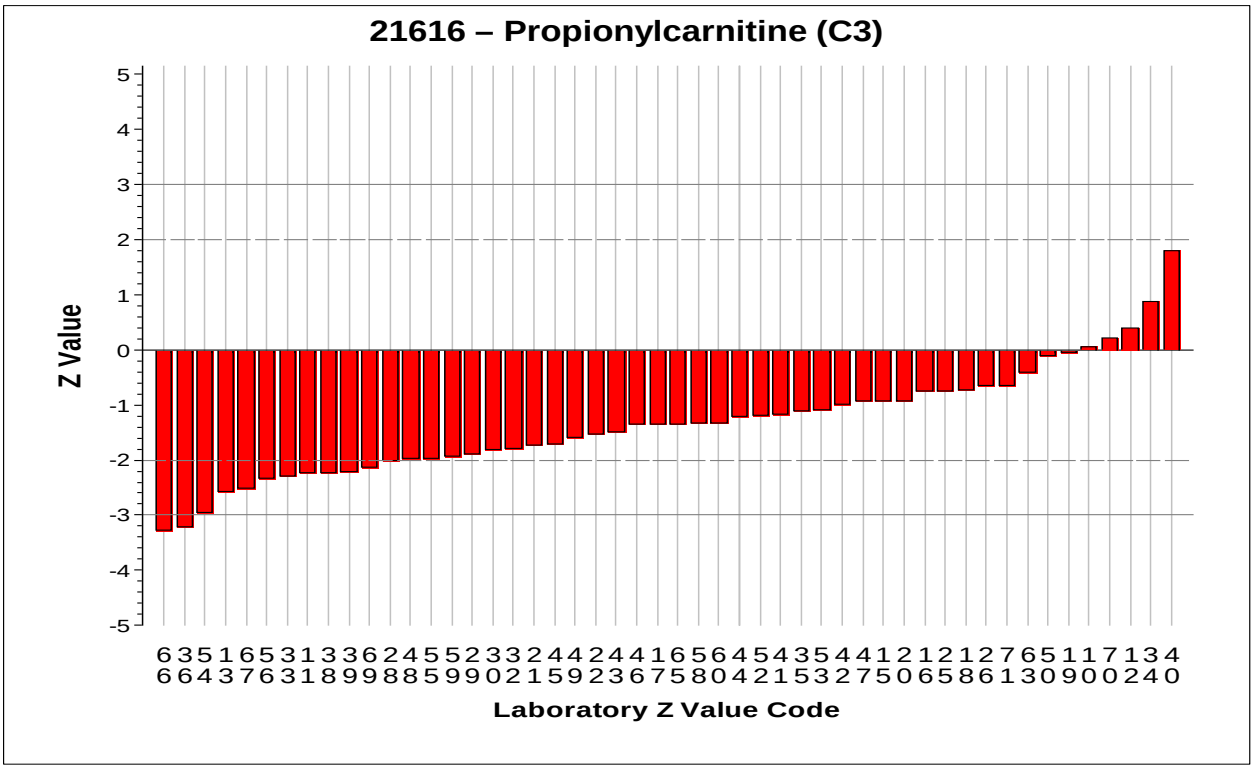

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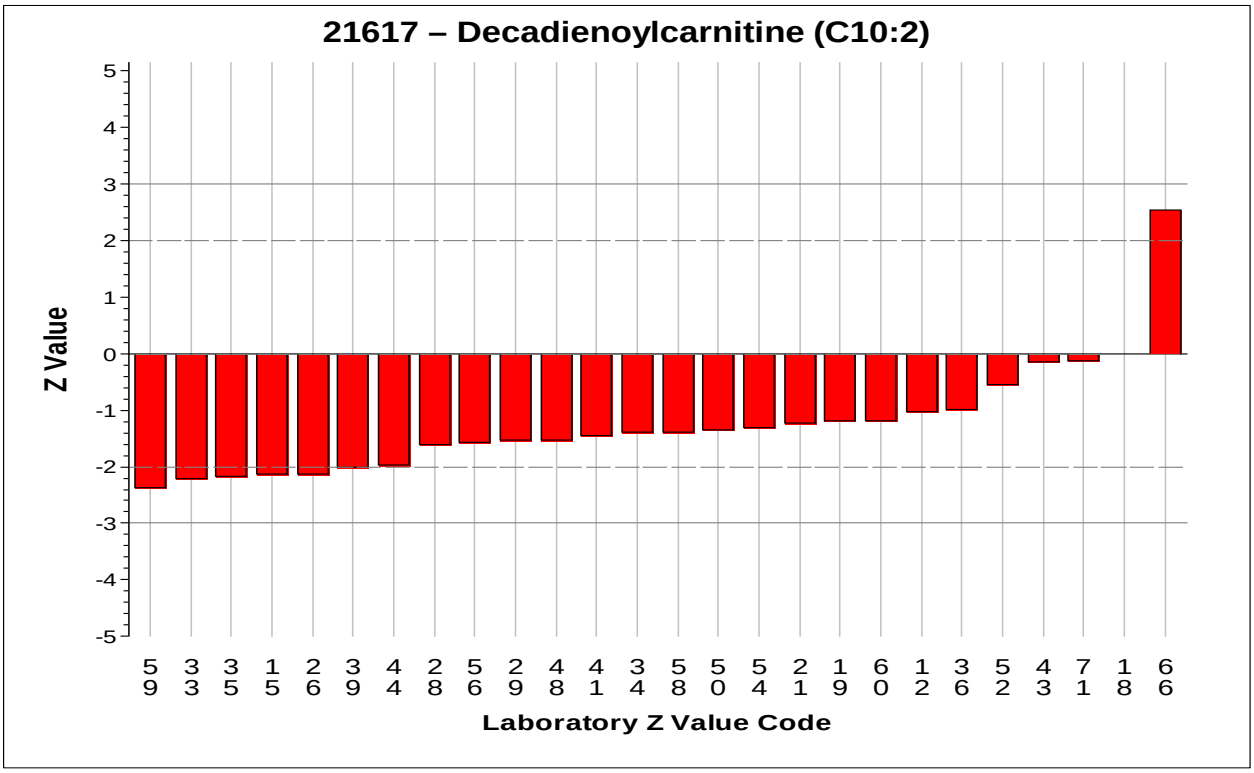

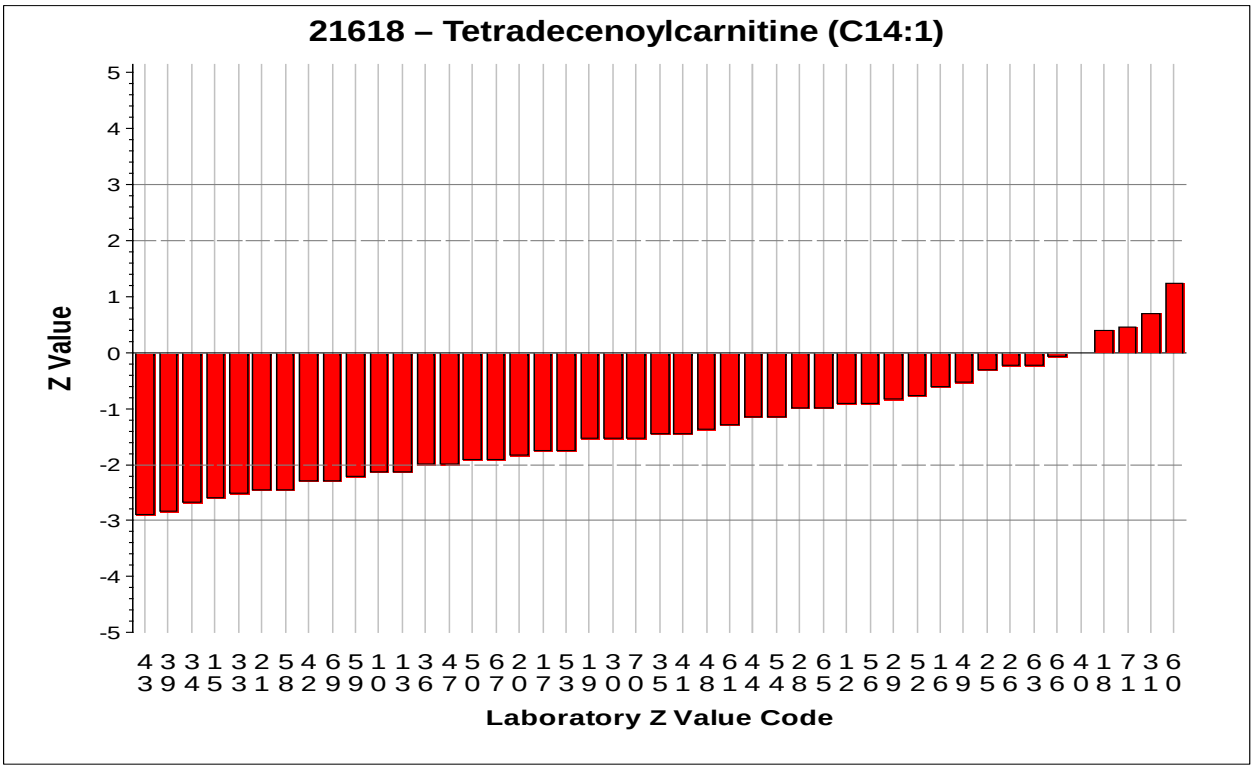

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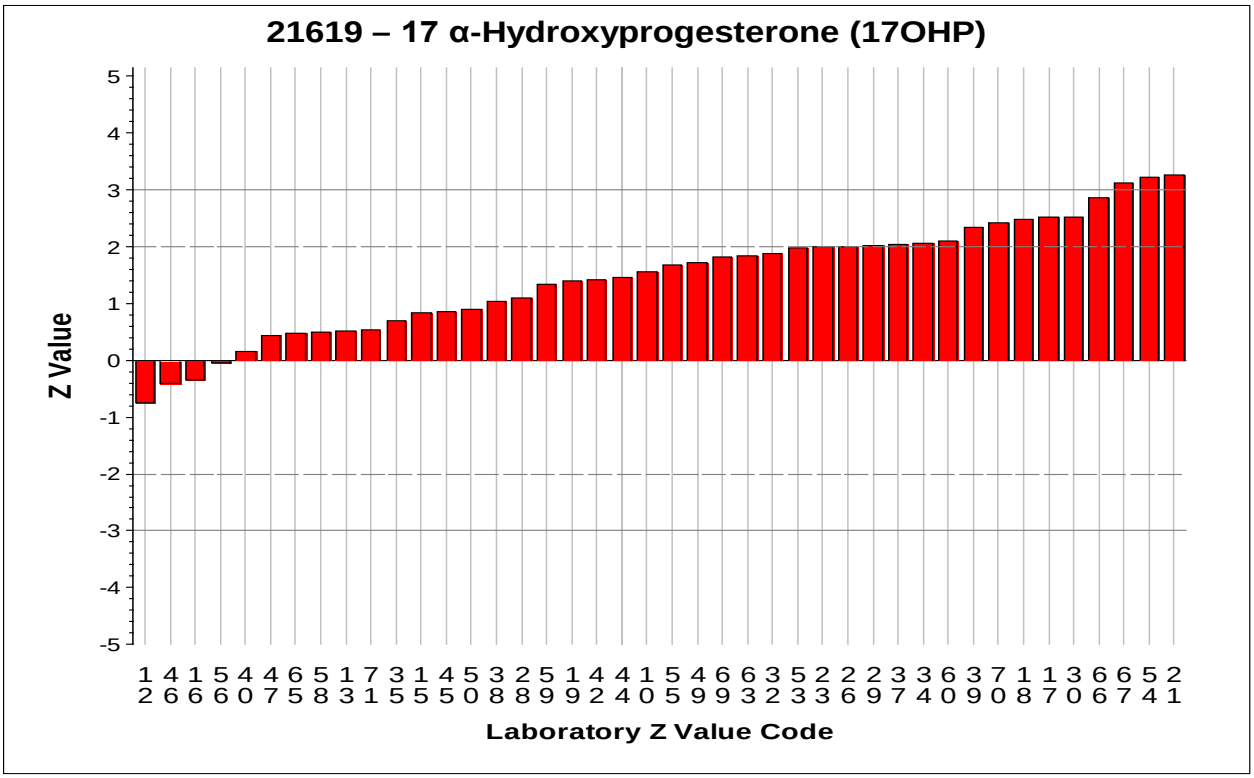

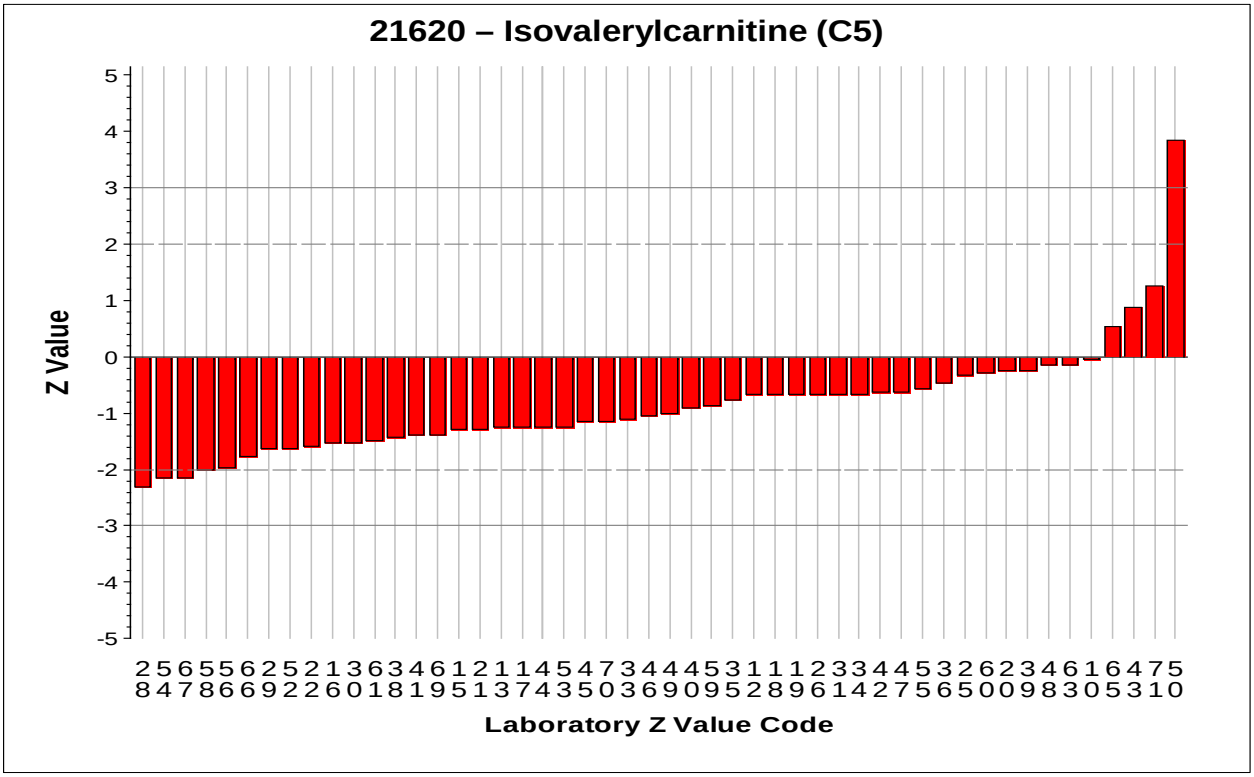

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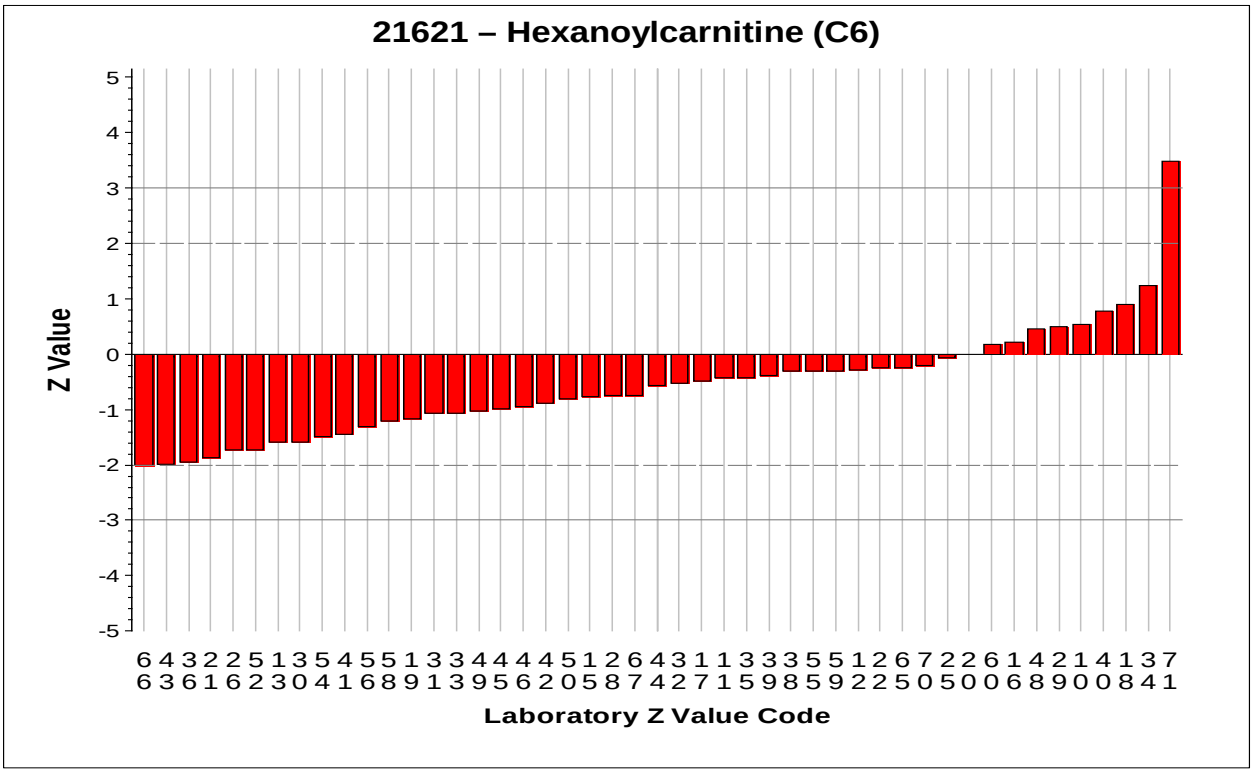

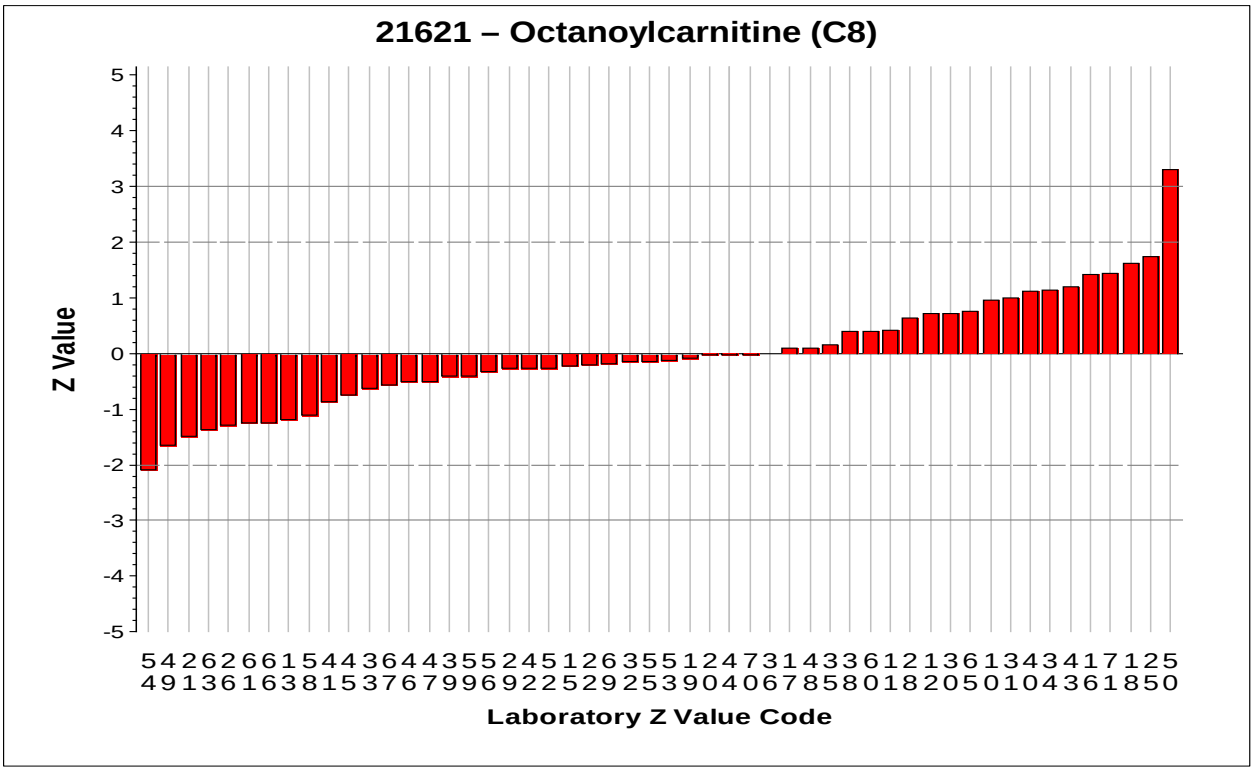

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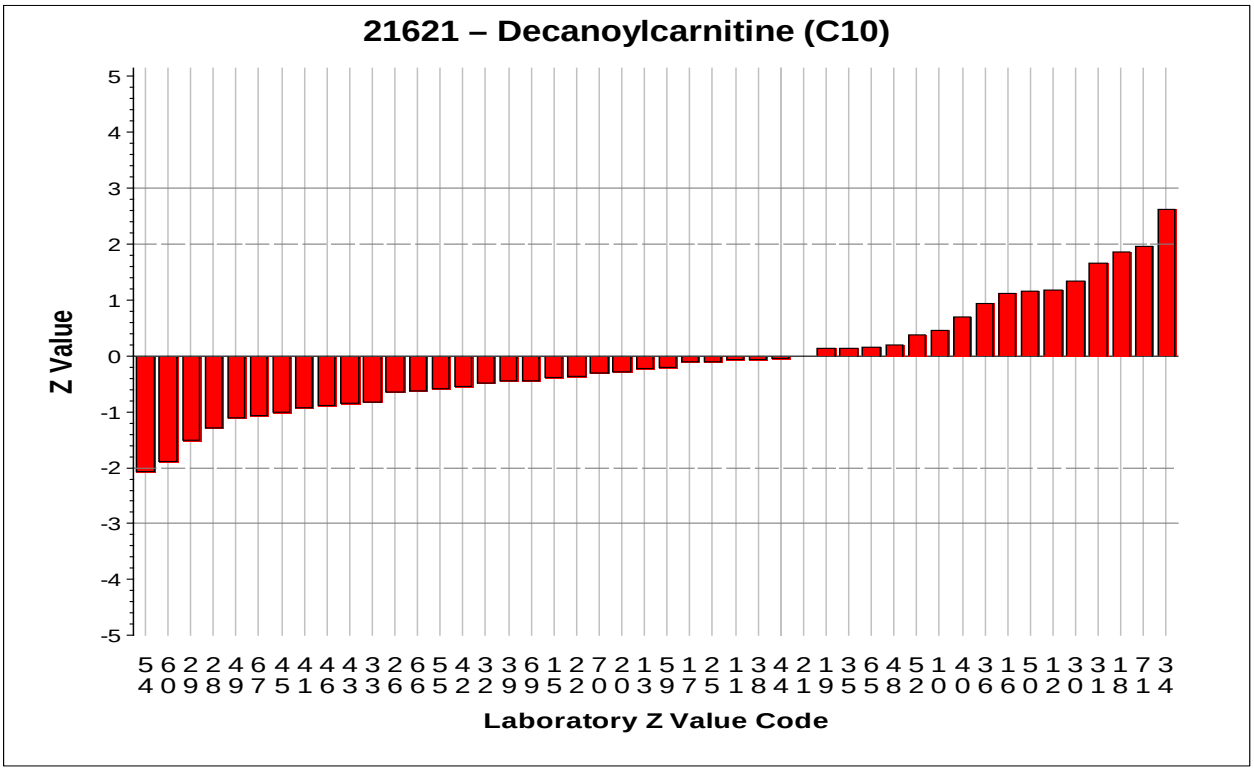

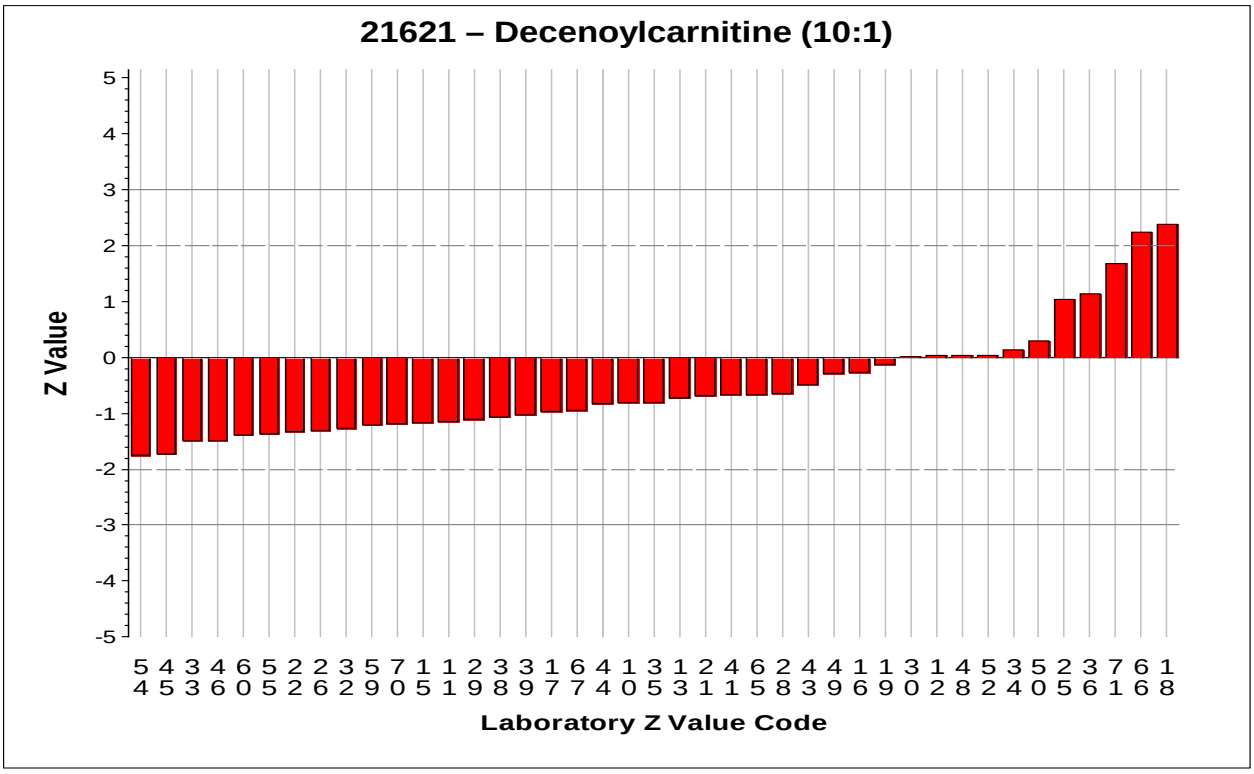

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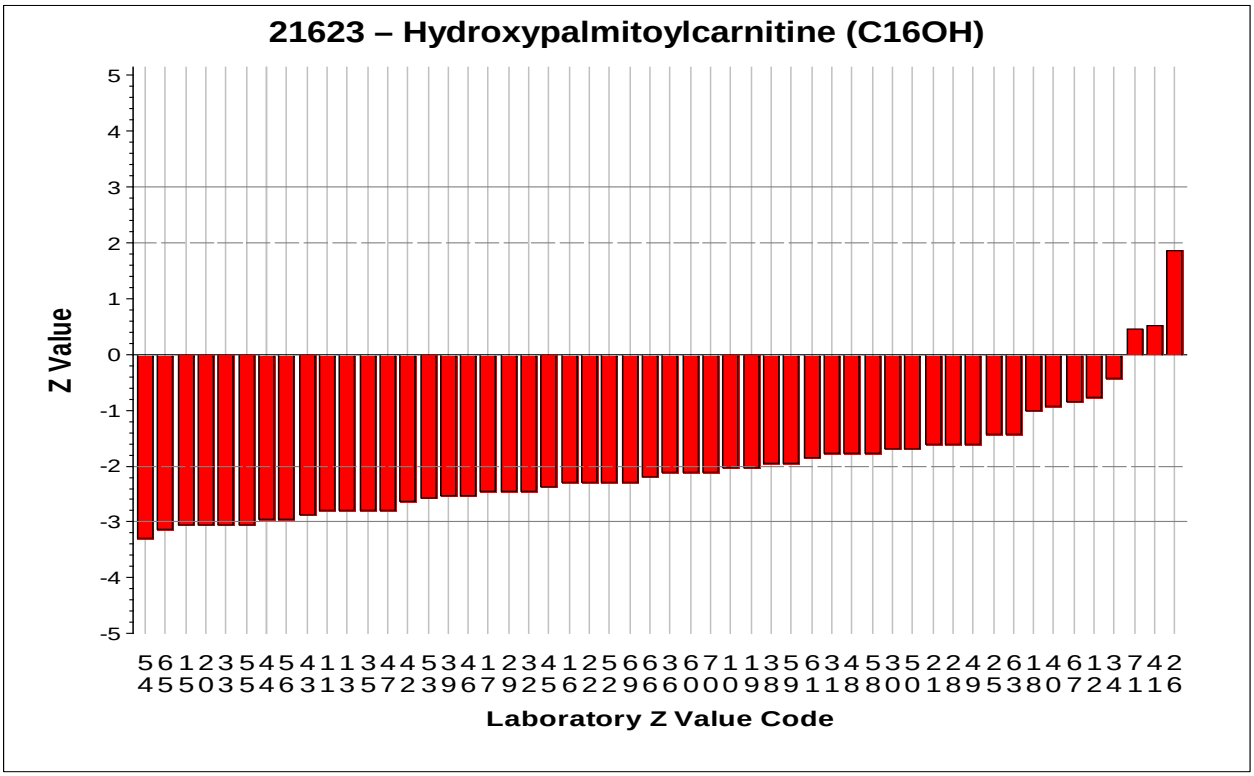

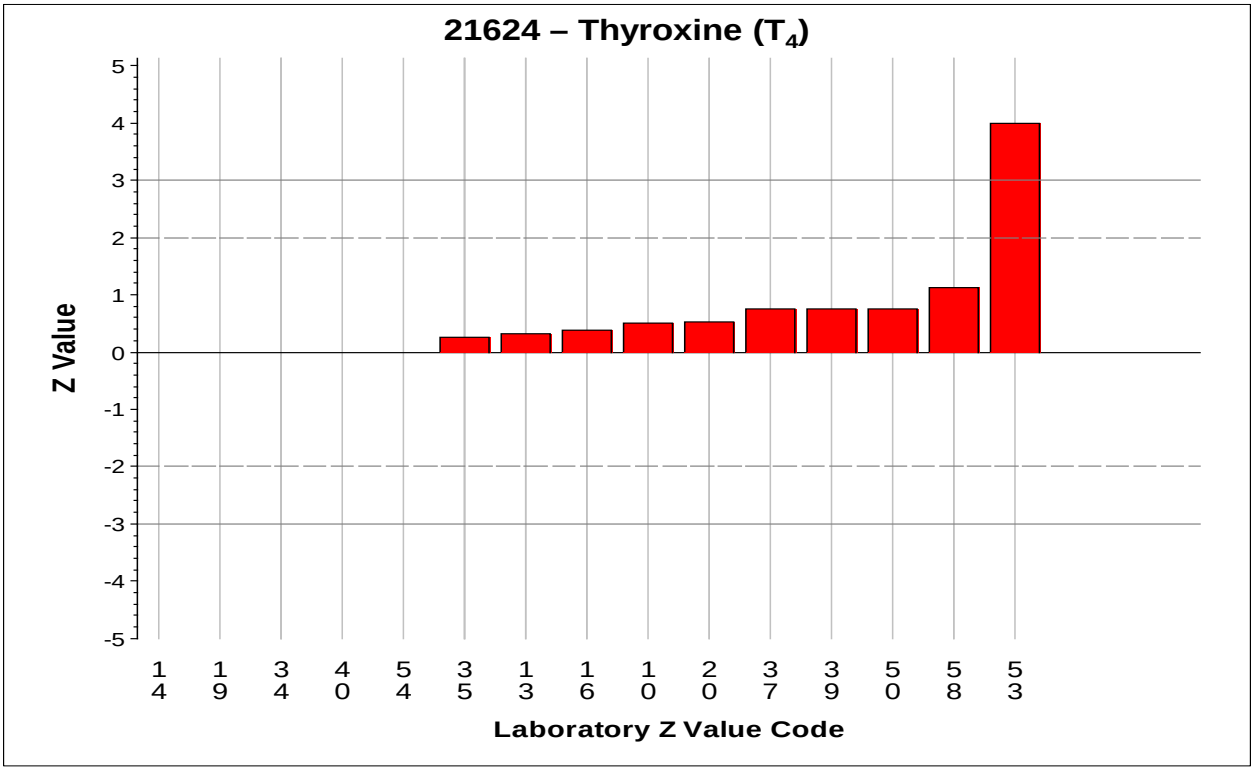

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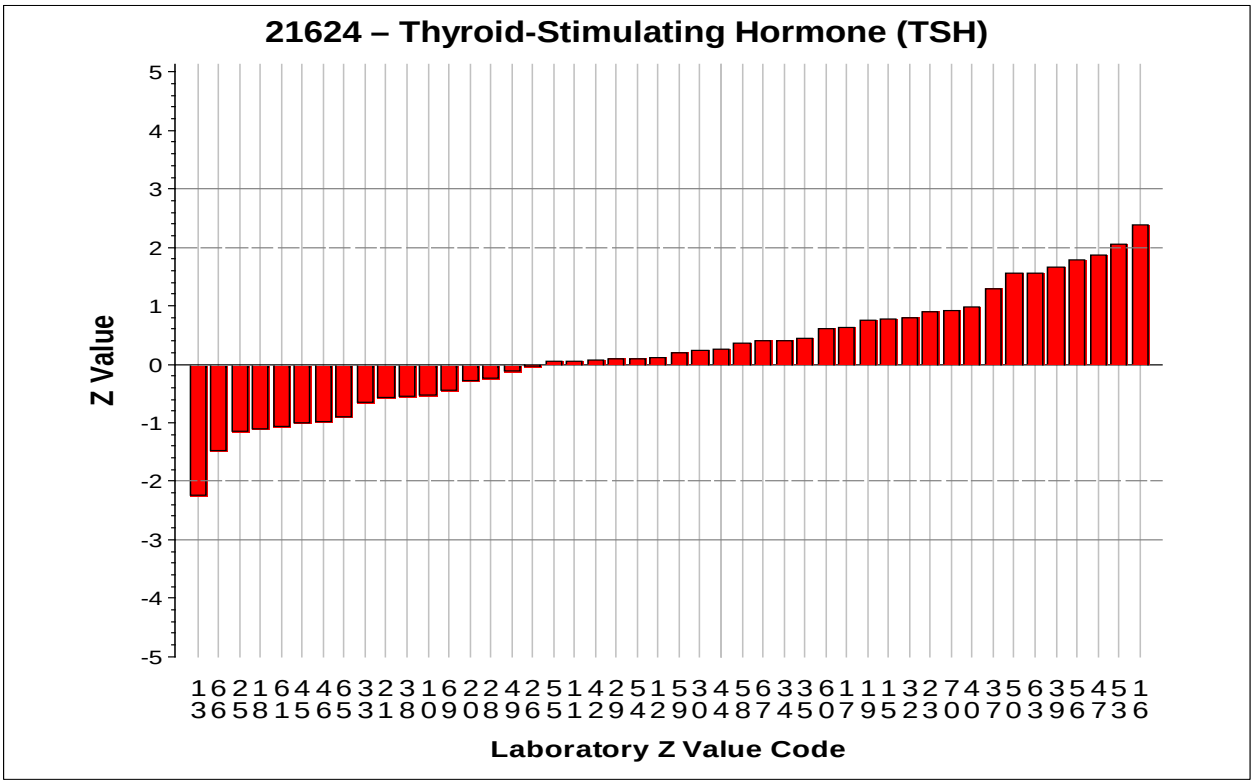

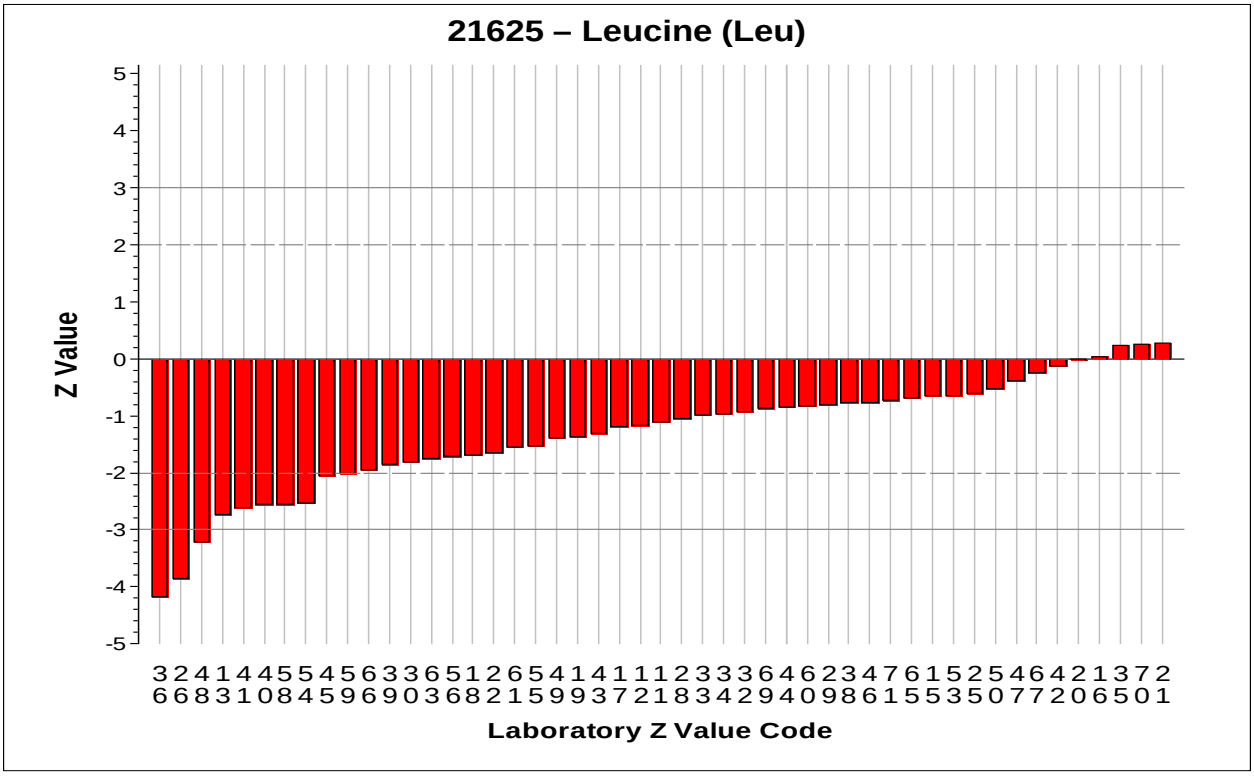

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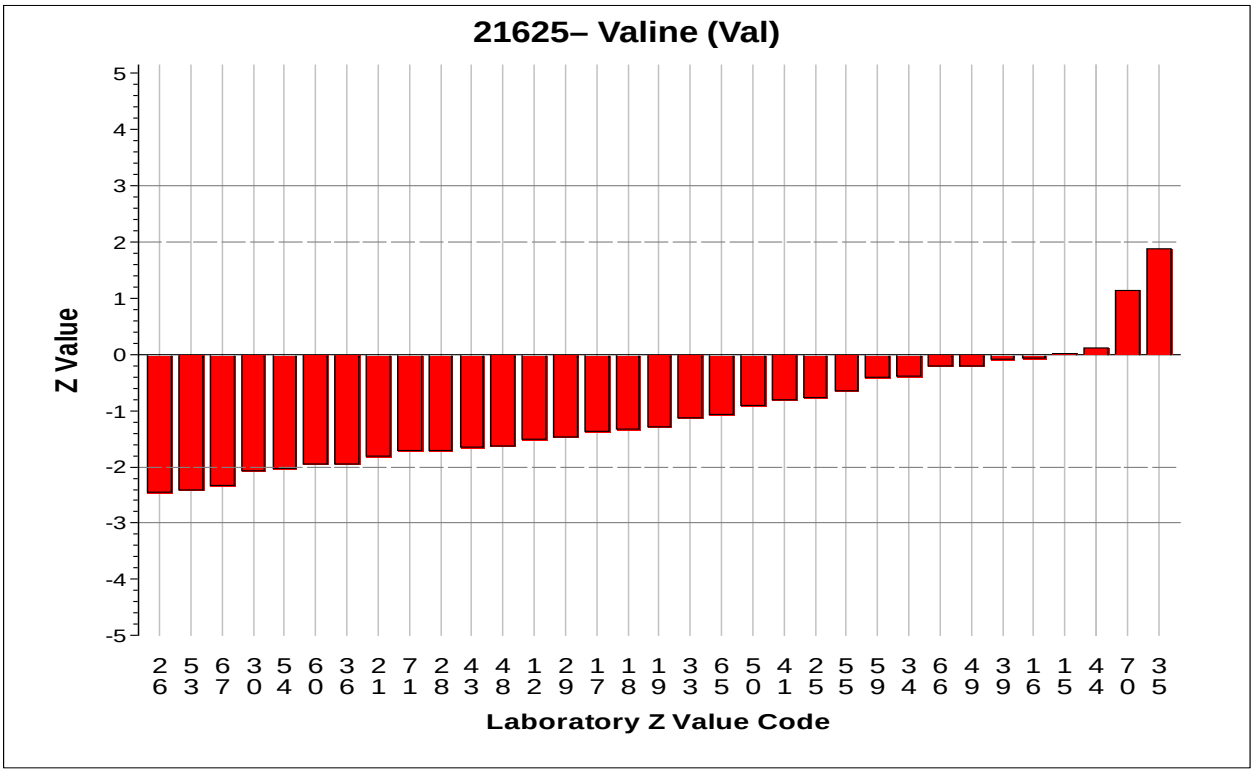

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