Newborn Screening Quality Assurance Program

QUALITY CONTROL MIDYEAR REPORT

Volume 25, No. 1 June 2014

INTRODUCTION

The Newborn Screening Quality Assurance Program (NSQAP), Centers for Disease Control and Prevention (CDC), distributed dried-blood-spot (DBS) quality control (QC) materials for thyroxine (T4), thyroid-stimulating hormone (TSH), 17 α-hydroxyprogesterone (17-OHP), total galactose (TGal), immunoreactive trypsinogen (IRT), phenylalanine (Phe), leucine (Leu), methionine (Met), tyrosine (Tyr), valine (Val), citrulline (Cit), alanine (Ala), arginine (Arg), succinylacetone (SUAC), and eighteen acylcarnitines (C0, C2, C3, C3DC , C4, C4OH , C5, C5DC, C5OH, C6, C8, C10, C12, C14, C16, C16OH, C18, C18OH) to laboratories operating newborn screening programs and to manufacturers of screening test products. Included with each semiannual shipment of QC specimens were instructions for downloading and submitting the paperless data report forms.

This midyear report contains a summary of the QC data submitted during the first half of 2014 by state, contract, and private laboratories in the United States; international participants; and manufacturers of screening test products.

QUALITY CONTROL MATERIALS

The QC specimen lots were provided as 6-month supplies of DBSs on filter paper. DBS QC lots were prepared from whole blood of 50% hematocrit. The QC materials were enriched with predetermined quantities of selected analytes and dispensed in 100 µL aliquots on GE Healthcare Bio-Sciences Corporation (formerly Whatman Inc.), Westborough, MA, Grade 903 filter paper.

A QC shipment for T4, TSH, or 17-OHP consisted of blood-spot materials from three lots per analyte, with each lot containing a different concentration of analyte. A QC shipment for IRT, TGal, Phe, Leu, Met, Tyr, Val, Cit, Ala, Arg, SUAC, and the acylcarnitines consisted of blood-spot cards from four different lots.

The QC materials were supplied for use as external controls in quantities sufficient to maintain continuity and transcend changes in production lots of routinely used method- or kit-control materials. The external QC materials were intended to supplement the participants' method- or kit-control materials at periodic intervals and to allow participants to monitor the long-term stability of their assays. The QC materials should not be used as routine daily QCs.

PARTICIPANTS' RESULTS

For this midyear report, we compiled the data that each participant reported from five analytic runs of specimens from each QC lot and calculated mean values and standard deviations. Data values outside the 99% confidence interval for each QC lot were not included in the computations. We could not include qualitative data, data submitted as inequalities or ranges, data submitted in unidentified units, or data from less than five analytic runs per specimen lot per participant. Some participants submitted results in units other than those requested on the data-report forms. To ensure that all results are appropriately entered in the CDC database, participants

---- QC DATA ----
see pages 3-37

CDC/APHL

This program is cosponsored by the Centers for Disease Control and Prevention (CDC) and the Association of Public Health Laboratories (APHL).

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must convert their results to the requested units before entering them on the data-report forms.

The reported QC data are summarized in tables on pages 3-37, which show the analyte by series of QC lots, the number of measurements (N), the mean values, and the standard deviations (SD) by kit or analytic method. In addition, we used a weighted linear regression analysis to examine the comparability by method of reported (aggregated) versus enriched concentrations. Results of the linear regression analyses are summarized in the tables on pages 3-37.

DISCUSSION

The enriched values of the QC specimen lots do not take into account the endogenous levels of the analytes. For Phe, Leu, Met, Tyr, Val, Cit, Ala, Arg, SUAC, and the acylcarnitines, the non-enriched base pools were distributed as the first QC specimen lot in each series so that participants could measure the endogenous concentration of the series. QC lots 1325-1328 were enriched with TGal, Phe, Leu, Met, Tyr, Val, Cit, Ala, Arg, and SUAC. QC lots 1365-1368 were enriched with acylcarnitines. TGal lots 1325-1328 were enriched with an equimolar ratio of simple galactose and galactose- 1-phosphate. All other QC lots were enriched with one analyte per lot.

The tables which summarize reported QC results (pages 3-36) show data for method-related differences in analytic recoveries and method bias. Because we prepared each QC lot series from a single batch of hematocrit-adjusted, non-enriched blood, the endogenous concentration was the same for all specimens across the lot series and should not affect the slope of the regression line among methods. Slope deviations may be related to analytic ranges for calibration curves. Generally, slope values substantially different from 1.0 indicate that a method has an analytic bias.

Because only three or four concentrations of QC materials are available for each analyte, a bias error in any one pool can markedly influence the slope and intercept. For the purpose of our assessment, we first calculated the within-laboratory SD component of the total SD and used the reported QC data from multiple analytic runs for regression analyses. We then calculated the Y-intercept and slope listed in each table using all analyte concentrations within a lot series (e.g., lots 1301, 1302, and 1303). The Y-intercept provides one measure of the endogenous concentration level for an analyte. For Phe, Leu, Met, Tyr, Val, Cit, Ala, Arg, SUAC, and the acylcarnitines, participants measured the endogenous concentration levels by analyzing the non-enriched QC lots. Ideally, the slope should be 1.0 with an acceptable range from 0.8 to 1.2, but further observation is required when discrepancies exist. Many analytes have method slopes near the low end of the range for both kit and non-kit methods, while some analytes continue to to show all method slopes below the acceptable range (C4OH and C16OH). Additionally, SUAC showed one non-derivatized method with a slope of 0.2 that is being used by over 40% of the participants. Slopes for all SUAC participants were in the range of 0.2 to 0.6, which is comparable to previous reports. For the acylcarnitines, improvments in slope were noted for both C0 and C18OH. The C3DC showed slope ranges of 0.5 and 1.3 for two of the most used derivatized methods. Although the analyte reporting category C3DC+C4OH showed low slope values for all three of the non-derivatized methods used, improvement was demonstrated since reported in March 2014.

Calculations of concentrations for the QC lots may vary with type of internal standard. Data are not sorted by internal standard type.

Each year, with the extensive cooperation of PerkinElmer Health Sciences and GE Healthcare Bio-Sciences Corporation, we routinely evaluate the absorption characteristics of filter papers approved by the Food and Drug Administration. Refer to page 12 of the 2013 Newborn Screening Quality Assurance Program Annual Summary Report* for graphs showing the serum absorption volumes of PerkinElmer Grade 226 and Whatman Grade 903 filter paper lots that CDC evaluated. The Whatman Grade 903 W112 used in the production of QC specimen lots distributed during the first six months of the year, 2014.

*Zobel, Sherri, editor. Newborn Screening Quality Assurance Program: 2013 Annual Summary Report. Atlanta: Centers for Disease Control and Prevention, 2013; 31:1-118.
http://www.cdc.gov/labstandards/nsqap.html

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services or the association of Public Health Laboratories.

2014 Quality Control Data
Summaries of Statistical Analyses

THYROXINE (μg T4/dL serum)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1301 - Assayed 1.6 μg/dL serum						
Siemens Healthcare Diagnostics	20	2.3	0.5	0.5	0.5	1.2
Neo-Genesis Accuwell	20	1.2	0.2	0.6	-0.4	1.0
Delfia	100	1.9	0.3	0.5	0.4	0.9
AutoDelfia	228	1.7	0.3	0.4	0.1	1.0
Interscientific NeoMAP Multiplex	49	1.7	0.3	0.4	0.1	1.0
PerkinElmer GSP Neonatal	122	1.6	0.2	0.2	0.0	1.0
Lot 1302 - Assayed 6.1 μg/dL serum						
Siemens Healthcare Diagnostics	20	8.0	1.3	1.3	0.5	1.2
Neo-Genesis Accuwell	20	6.0	0.5	0.7	-0.4	1.0
Delfia	97	5.8	0.7	0.8	0.4	0.9
AutoDelfia	235	6.1	0.6	0.8	0.1	1.0
Interscientific NeoMAP Multiplex	50	6.2	0.6	0.7	0.1	1.0
PerkinElmer GSP Neonatal	129	6.4	0.5	0.6	0.0	1.0
Lot 1303 - Assayed 9.5 μg/dL serum						
Siemens Healthcare Diagnostics	20	11.6	1.3	1.3	0.5	1.2
Neo-Genesis Accuwell	19	9.3	0.6	0.6	-0.4	1.0
Delfia	100	9.2	1.2	1.3	0.4	0.9
AutoDelfia	238	9.3	0.9	1.1	0.1	1.0
Interscientific NeoMAP Multiplex	50	9.8	1.1	1.4	0.1	1.0
PerkinElmer GSP Neonatal	124	9.7	0.8	1.1	0.0	1.0

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

THYROID-STIMULATING HORMONE (μIU TSH/mL serum)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1311 - Enriched 25.0 μIU/mL serum						
Siemens Healthcare Diagnostics	40	31.6	2.3	2.5	2.8	1.2
Neo-Genesis Accuwell	20	18.9	1.7	8.3	-10.4	1.2
Delfia	480	25.2	2.4	4.9	-0.1	1.0
AutoDelfia	908	26.1	2.2	2.8	0.3	1.0
Ani Labsystems	108	24.2	2.5	3.8	-0.8	1.0
Bio-Rad Quantase	97	25.3	3.4	9.4	4.9	0.9
TecnoSuma UMELISA	30	29.6	3.3	4.0	0.8	1.2
Bioclone ELISA	20	20.9	2.2	3.6	-1.4	0.9
DiaSorin	88	25.6	2.4	3.6	3.1	0.9
Interscientific NeoMAP Multiplex	40	22.2	2.6	3.9	-3.6	1.0
PerkinElmer GSP Neonatal	283	23.5	2.1	3.5	-0.3	0.9
In House	40	25.3	2.7	8.0	3.9	0.9
Lot 1312 - Enriched 40.0 μIU/mL serum						
Siemens Healthcare Diagnostics	39	49.7	4.4	6.0	2.8	1.2
Neo-Genesis Accuwell	20	34.8	2.9	8.1	-10.4	1.2
Delfia	471	41.0	4.2	7.2	-0.1	1.0
AutoDelfia	913	42.0	3.5	4.8	0.3	1.0
Ani Labsystems	97	40.4	4.2	5.7	-0.8	1.0
Bio-Rad Quantase	100	41.4	6.8	14.0	4.9	0.9
TecnoSuma UMELISA	29	51.3	4.7	8.2	0.8	1.2
Bioclone ELISA	20	33.7	4.3	5.7	-1.4	0.9
DiaSorin	90	40.5	3.8	5.3	3.1	0.9
Interscientific NeoMAP Multiplex	40	35.8	2.8	6.0	-3.6	1.0
PerkinElmer GSP Neonatal	286	37.0	3.3	5.9	-0.3	0.9
In House	38	40.8	3.4	12.1	3.9	0.9
Lot 1313 - Enriched 80.0 μIU/mL serum						
Siemens Healthcare Diagnostics	37	95.6	10.8	13.1	2.8	1.2
Neo-Genesis Accuwell	20	81.8	14.5	14.5	-10.4	1.2
Delfia	466	81.5	7.5	11.8	-0.1	1.0
AutoDelfia	906	83.2	6.9	10.7	0.3	1.0
Ani Labsystems	100	80.2	7.5	9.6	-0.8	1.0
Bio-Rad Quantase	100	74.0	12.3	25.8	4.9	0.9
TecnoSuma UMELISA	30	97.2	11.1	11.5	0.8	1.2
Bioclone ELISA	20	69.4	11.0	19.2	-1.4	0.9
DiaSorin	87	76.4	7.8	10.3	3.1	0.9
Interscientific NeoMAP Multiplex	39	77.1	5.5	10.2	-3.6	1.0
PerkinElmer GSP Neonatal	281	75.1	6.5	9.1	-0.3	0.9
In House	40	74.8	8.5	25.9	3.9	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

17 α-HYDROXYPROGESTERONE (ng 17-OHP/mL serum)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1351 - Enriched 25.0 ng/mL serum						
Siemens Healthcare Diagnostics	30	21.5	2.5	3.9	3.1	0.7
Neo-Genesis Accuwell	20	22.6	1.7	1.7	4.0	0.9
Delfia	177	18.2	1.6	2.8	-2.4	0.8
Delfia Neonatal 17-OHP (A024)	68	20.5	2.9	5.6	-1.7	0.9
AutoDelfia	230	21.1	2.2	3.4	-1.1	0.9
AutoDelfia Neonatal 17-OHP (B024)	405	20.0	1.9	2.8	0.2	0.8
Bio-Rad Quantase	100	19.8	3.2	7.9	-1.7	0.8
TecnoSuma UMELISA	19	28.8	1.6	5.9	-1.0	1.2
LC-MS/MS	20	24.0	3.9	3.9	-1.3	1.0
MP Biomedicals RIA	20	25.9	3.2	3.2	4.4	0.9
PerkinElmer GSP Neonatal	229	20.7	1.7	2.5	1.0	0.8
In House	18	25.5	3.1	3.1	8.9	0.7
Lot 1352 - Enriched 50.0 ng/mL serum						
Siemens Healthcare Diagnostics	30	40.4	4.3	5.9	3.1	0.7
Neo-Genesis Accuwell	20	51.4	3.7	5.7	4.0	0.9
Delfia	177	38.7	3.6	6.6	-2.4	0.8
Delfia Neonatal 17-OHP (A024)	67	44.2	6.8	12.7	-1.7	0.9
AutoDelfia	228	44.0	3.9	6.5	-1.1	0.9
AutoDelfia Neonatal 17-OHP (B024)	404	42.5	4.0	5.3	0.2	0.8
Bio-Rad Quantase	98	37.2	5.9	14.6	-1.7	0.8
TecnoSuma UMELISA	20	62.3	6.0	18.4	-1.0	1.2
LC-MS/MS	19	45.8	5.2	6.1	-1.3	1.0
MP Biomedicals RIA	20	51.0	4.2	4.7	4.4	0.9
PerkinElmer GSP Neonatal	237	42.8	3.5	4.6	1.0	0.8
In House	20	44.3	6.7	11.9	8.9	0.7
Lot 1353 - Enriched 100.0 ng/mL serum						
Siemens Healthcare Diagnostics	30	77.2	9.1	15.3	3.1	0.7
Neo-Genesis Accuwell	19	88.5	6.6	6.7	4.0	0.9
Delfia	178	79.8	8.0	17.2	-2.4	0.8
Delfia Neonatal 17-OHP (A024)	70	88.4	14.6	25.4	-1.7	0.9
AutoDelfia	229	88.3	8.6	13.5	-1.1	0.9
AutoDelfia Neonatal 17-OHP (B024)	402	81.9	7.3	10.4	0.2	0.8
Bio-Rad Quantase	100	80.4	21.4	39.1	-1.7	0.8
TecnoSuma UMELISA	20	122.0	12.5	32.8	-1.0	1.2
LC-MS/MS	20	96.4	8.3	15.3	-1.3	1.0
MP Biomedicals RIA	20	93.9	10.2	12.7	4.4	0.9
PerkinElmer GSP Neonatal	237	82.4	6.6	8.5	1.0	0.8
In House	20	77.5	10.7	21.8	8.9	0.7

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

IMMUNOREACTIVE TRYPSINOGEN (ng IRT/mL whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1391 - Assayed 16.9 ng/mL whole blood						
MP Biomedicals ELISA	60	21.8	3.1	8.3	0.0	1.5
Delfia	211	14.5	1.7	2.2	-0.0	0.9
AutoDelfia	717	15.2	1.1	1.5	0.4	0.9
Bio-Rad Quantase	20	29.1	3.5	15.3	12.6	1.2
PerkinElmer GSP Neonatal	226	15.4	1.0	1.2	-1.3	0.9
Lot 1392 - Assayed 54.4 ng/mL whole blood						
MP Biomedicals ELISA	59	77.3	9.6	22.4	0.0	1.5
Delfia	216	45.9	5.2	6.5	-0.0	0.9
AutoDelfia	717	47.8	3.3	4.5	0.4	0.9
Bio-Rad Quantase	20	76.0	6.9	39.7	12.6	1.2
PerkinElmer GSP Neonatal	216	47.1	2.9	3.5	-1.3	0.9
Lot 1393 - Assayed 107.3 ng/mL whole blood						
MP Biomedicals ELISA	59	181.1	22.8	58.2	0.0	1.5
Delfia	219	93.8	9.4	12.0	-0.0	0.9
AutoDelfia	734	100.2	6.7	9.0	0.4	0.9
Bio-Rad Quantase	20	144.2	11.3	54.8	12.6	1.2
PerkinElmer GSP Neonatal	218	98.8	5.6	7.1	-1.3	0.9
Lot 1394 - Assayed 188.6 ng/mL whole blood						
MP Biomedicals ELISA	60	279.3	37.1	88.3	0.0	1.5
Delfia	212	161.7	14.0	16.9	-0.0	0.9
AutoDelfia	736	168.8	10.3	13.5	0.4	0.9
Bio-Rad Quantase	20	228.6	20.2	44.8	12.6	1.2
PerkinElmer GSP Neonatal	223	173.1	9.3	11.0	-1.3	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

TOTAL GALACTOSE (mg Gal/dL whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1325 - Enriched 5.0 mg/dL whole blood						
Siemens Healthcare Diagnostics	40	5.2	0.3	0.5	1.9	0.9
Fluorometric Manual	110	4.5	0.4	2.0	-0.6	0.9
Colorimetric	30	6.3	1.4	1.7	-0.2	1.3
PerkinElmer Neonatal Kit	240	5.0	0.5	0.6	1.6	0.8
Neo-Genesis Accuwell	20	5.8	0.6	1.1	0.4	1.1
Bio-Rad Quantase	169	6.2	1.1	1.6	-0.5	1.3
MP Biomedicals Enzyme Assay	30	8.0	1.9	3.5	1.9	1.3
Interscientific Enzyme	38	5.0	0.6	0.6	0.2	0.9
Astoria-Pacific	110	6.3	0.6	0.9	1.3	1.0
TecnoSuma UMTEST	30	5.6	1.1	2.5	-1.1	1.3
R&D Diagnostics Greece	20	5.0	0.9	0.9	0.7	0.9
Lot 1326 - Enriched 10.0 mg/dL whole blood						
Siemens Healthcare Diagnostics	40	10.5	0.7	0.9	1.9	0.9
Fluorometric Manual	110	8.5	0.8	3.6	-0.6	0.9
Colorimetric	30	13.4	2.1	3.0	-0.2	1.3
PerkinElmer Neonatal Kit	251	9.5	0.9	1.5	1.6	0.8
Neo-Genesis Accuwell	20	11.7	0.9	1.6	0.4	1.1
Bio-Rad Quantase	165	12.3	1.5	2.8	-0.5	1.3
MP Biomedicals Enzyme Assay	29	15.3	2.0	5.4	1.9	1.3
Interscientific Enzyme	40	9.1	1.0	1.0	0.2	0.9
Astoria-Pacific	109	11.3	0.8	1.6	1.3	1.0
TecnoSuma UMTEST	30	11.1	1.4	3.3	-1.1	1.3
R&D Diagnostics Greece	20	9.1	1.0	1.9	0.7	0.9

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2014 Quality Control Data
Summaries of Statistical Analyses

TOTAL GALACTOSE (mg Gal/dL whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1327 - Enriched 15.0 mg/dL whole blood						
Siemens Healthcare Diagnostics	40	15.8	0.8	1.0	1.9	0.9
Fluorometric Manual	110	12.5	0.9	5.1	-0.6	0.9
Colorimetric	30	19.8	1.9	3.6	-0.2	1.3
PerkinElmer Neonatal Kit	246	13.2	1.2	1.6	1.6	0.8
Neo-Genesis Accuwell	20	16.5	1.2	1.7	0.4	1.1
Bio-Rad Quantase	167	18.8	2.7	4.7	-0.5	1.3
MP Biomedicals Enzyme Assay	30	23.4	3.7	8.2	1.9	1.3
Interscientific Enzyme	39	14.2	1.0	1.3	0.2	0.9
Astoria-Pacific	106	16.1	1.4	2.2	1.3	1.0
TecnoSuma UMTEST	28	18.8	1.6	2.0	-1.1	1.3
R&D Diagnostics Greece	20	13.9	2.0	3.1	0.7	0.9
Lot 1328 - Enriched 30.0 mg/dL whole blood						
Siemens Healthcare Diagnostics	40	26.8	1.7	6.6	1.9	0.9
Fluorometric Manual	98	27.2	2.9	5.3	-0.6	0.9
Colorimetric	30	39.8	4.1	10.8	-0.2	1.3
PerkinElmer Neonatal Kit	249	24.3	2.2	3.3	1.6	0.8
Neo-Genesis Accuwell	20	33.3	2.0	3.5	0.4	1.1
Bio-Rad Quantase	168	38.6	4.6	8.9	-0.5	1.3
MP Biomedicals Enzyme Assay	30	41.8	4.1	12.1	1.9	1.3
Interscientific Enzyme	40	27.8	2.1	2.3	0.2	0.9
Astoria-Pacific	105	31.2	2.3	3.6	1.3	1.0
TecnoSuma UMTEST	30	37.5	3.3	4.6	-1.1	1.3
R&D Diagnostics Greece	20	26.5	3.8	5.4	0.7	0.9

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2014 Quality Control Data
Summaries of Statistical Analyses

PHENYLALANINE (μmol Phe/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1325 - Nonenriched 0 μmol/L whole blood						
Fluorometric Manual	100	95.9	12.1	31.3	93.7	1.1
PerkinElmer Neonatal Kit	262	78.2	9.6	15.8	80.5	0.9
Ani Labsystems	104	82.3	12.9	18.4	83.6	1.3
Bio-Rad Quantase	50	74.9	18.6	51.0	72.3	0.8
MP Biomedicals Enzyme Assay	20	68.8	25.0	26.4	58.2	1.2
Interscientific Enzyme	80	73.1	8.4	19.3	76.7	0.9
IBL International Neonatal Screening Kit	80	72.7	14.6	34.3	69.9	1.2
Astoria-Pacific	20	80.5	3.7	21.3	82.1	1.0
Derivatized - MS/MS non-kit	871	66.5	5.2	9.0	68.9	0.9
Non-derivatized - MS/MS non-kit	350	68.9	4.5	8.2	70.7	1.0
Derivatized - MS/MS PE NeoGram Kit	149	63.2	5.2	6.9	64.4	0.9
Non-derivatized - MS/MS PE NeoBase Kit	574	65.0	4.7	6.9	66.5	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	78	65.7	6.1	6.4	69.3	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	80	70.5	5.2	12.7	71.8	1.0
TecnoSuma UMTEST	30	133.8	25.5	50.7	126.6	1.3
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	67.6	3.7	7.0	70.5	0.9
Lot 1326 - Enriched 100.0 μmol/L whole blood						
Fluorometric Manual	96	210.9	21.1	46.0	93.7	1.1
PerkinElmer Neonatal Kit	265	170.7	15.2	28.4	80.5	0.9
Ani Labsystems	110	212.7	20.4	38.7	83.6	1.3
Bio-Rad Quantase	48	151.4	26.0	96.5	72.3	0.8
MP Biomedicals Enzyme Assay	20	176.8	30.8	47.2	58.2	1.2
Interscientific Enzyme	80	169.4	13.6	33.2	76.7	0.9
IBL International Neonatal Screening Kit	80	177.9	14.7	80.2	69.9	1.2
Astoria-Pacific	20	177.9	8.0	24.6	82.1	1.0
Derivatized - MS/MS non-kit	863	156.4	12.4	21.2	68.9	0.9
Non-derivatized - MS/MS non-kit	356	164.9	11.4	22.0	70.7	1.0
Derivatized - MS/MS PE NeoGram Kit	149	148.6	10.7	15.6	64.4	0.9
Non-derivatized - MS/MS PE NeoBase Kit	579	153.2	11.0	17.6	66.5	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	79	154.0	12.3	13.7	69.3	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	78	166.1	11.9	29.8	71.8	1.0
TecnoSuma UMTEST	29	237.5	34.7	65.8	126.6	1.3
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	160.8	10.5	15.4	70.5	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

PHENYLALANINE (μmol Phe/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1327 - Enriched 200.0 μmol/L whole blood						
Fluorometric Manual	100	299.8	24.4	121.8	93.7	1.1
PerkinElmer Neonatal Kit	258	269.6	23.4	45.8	80.5	0.9
Ani Labsystems	108	342.0	27.5	55.1	83.6	1.3
Bio-Rad Quantase	50	241.1	26.5	144.5	72.3	0.8
MP Biomedicals Enzyme Assay	19	257.1	35.8	35.9	58.2	1.2
Interscientific Enzyme	77	270.5	18.3	36.1	76.7	0.9
IBL International Neonatal Screening Kit	80	307.6	26.1	138.1	69.9	1.2
Astoria-Pacific	19	278.3	10.5	16.5	82.1	1.0
Derivatized - MS/MS non-kit	868	256.5	20.4	36.8	68.9	0.9
Non-derivatized - MS/MS non-kit	357	270.7	17.9	37.6	70.7	1.0
Derivatized - MS/MS PE NeoGram Kit	150	245.7	20.7	27.3	64.4	0.9
Non-derivatized - MS/MS PE NeoBase Kit	579	254.0	18.6	28.2	66.5	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	78	250.9	19.7	21.4	69.3	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	80	277.0	17.7	48.7	71.8	1.0
TecnoSuma UMTEST	30	412.1	33.0	108.5	126.6	1.3
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	48	263.1	11.1	18.6	70.5	0.9
Lot 1328 - Enriched 300.0 μmol/L whole blood						
Fluorometric Manual	100	438.1	34.5	65.9	93.7	1.1
PerkinElmer Neonatal Kit	264	347.4	28.7	52.4	80.5	0.9
Ani Labsystems	110	466.5	36.1	83.5	83.6	1.3
Bio-Rad Quantase	50	324.5	36.5	181.9	72.3	0.8
MP Biomedicals Enzyme Assay	20	432.8	76.1	83.0	58.2	1.2
Interscientific Enzyme	79	345.9	25.5	39.3	76.7	0.9
IBL International Neonatal Screening Kit	80	414.8	33.9	187.5	69.9	1.2
Astoria-Pacific	20	366.1	28.9	35.8	82.1	1.0
Derivatized - MS/MS non-kit	869	329.1	26.7	46.6	68.9	0.9
Non-derivatized - MS/MS non-kit	355	353.2	21.4	42.9	70.7	1.0
Derivatized - MS/MS PE NeoGram Kit	149	319.2	21.5	40.2	64.4	0.9
Non-derivatized - MS/MS PE NeoBase Kit	580	328.7	25.6	38.4	66.5	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	76	316.8	22.7	24.8	69.3	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	80	358.3	28.3	56.2	71.8	1.0
TecnoSuma UMTEST	30	518.0	49.7	132.1	126.6	1.3
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	337.4	20.3	30.8	70.5	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

LEUCINE (μmol Leu/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1325 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	813	133.5	10.8	24.2	138.1	0.8
Non-derivatized - MS/MS non-kit	266	157.1	12.8	21.8	160.1	0.9
Derivatized - MS/MS PE NeoGram Kit	147	126.4	11.2	13.0	128.1	0.9
Non-derivatized - MS/MS PE NeoBase Kit	548	155.4	11.2	17.9	158.3	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	83	133.3	11.7	15.5	135.8	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	145.4	9.7	26.5	146.4	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	49	160.2	7.7	18.1	169.0	0.9
Lot 1326 - Enriched 100.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	809	223.6	19.4	38.4	138.1	0.8
Non-derivatized - MS/MS non-kit	265	251.4	18.6	34.2	160.1	0.9
Derivatized - MS/MS PE NeoGram Kit	150	215.3	18.0	21.8	128.1	0.9
Non-derivatized - MS/MS PE NeoBase Kit	553	246.0	17.4	29.9	158.3	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	85	218.0	20.6	26.7	135.8	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	229.7	12.8	39.5	146.4	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	258.7	19.1	30.0	169.0	0.9
Lot 1327 - Enriched 250.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	804	347.7	28.5	54.1	138.1	0.8
Non-derivatized - MS/MS non-kit	269	384.2	31.8	59.6	160.1	0.9
Derivatized - MS/MS PE NeoGram Kit	148	347.1	27.6	32.5	128.1	0.9
Non-derivatized - MS/MS PE NeoBase Kit	552	380.3	25.6	40.1	158.3	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	88	329.9	19.5	25.2	135.8	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	356.2	17.8	57.9	146.4	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	397.3	22.4	41.5	169.0	0.9
Lot 1328 - Enriched 500.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	812	546.7	47.2	87.3	138.1	0.8
Non-derivatized - MS/MS non-kit	268	603.1	48.8	85.4	160.1	0.9
Derivatized - MS/MS PE NeoGram Kit	148	559.7	42.5	63.0	128.1	0.9
Non-derivatized - MS/MS PE NeoBase Kit	556	590.9	39.2	65.4	158.3	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	90	527.1	39.4	47.9	135.8	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	561.2	35.8	79.6	146.4	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	48	594.6	35.2	45.9	169.0	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

METHIONINE (μmol Met/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1325 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	814	18.8	2.3	3.5	19.4	0.8
Non-derivatized - MS/MS non-kit	266	17.2	1.8	2.9	16.2	0.8
Derivatized - MS/MS PE NeoGram Kit	138	20.3	2.4	2.7	20.1	0.8
Non-derivatized - MS/MS PE NeoBase Kit	557	16.2	1.5	2.2	15.1	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	87	15.4	3.4	5.0	16.2	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	67	12.6	1.4	2.8	10.3	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	49	17.4	0.9	2.8	16.9	0.8
Lot 1326 - Enriched 50.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	819	59.1	5.5	9.2	19.4	0.8
Non-derivatized - MS/MS non-kit	268	57.3	4.5	8.8	16.2	0.8
Derivatized - MS/MS PE NeoGram Kit	137	61.4	5.4	6.3	20.1	0.8
Non-derivatized - MS/MS PE NeoBase Kit	559	54.0	3.7	6.2	15.1	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	87	46.4	6.7	12.2	16.2	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	42.1	3.9	7.1	10.3	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	48	57.1	3.5	7.5	16.9	0.8
Lot 1327 - Enriched 150.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	822	137.8	11.9	20.4	19.4	0.8
Non-derivatized - MS/MS non-kit	270	137.9	11.1	21.7	16.2	0.8
Derivatized - MS/MS PE NeoGram Kit	135	145.0	14.1	15.9	20.1	0.8
Non-derivatized - MS/MS PE NeoBase Kit	563	132.8	9.4	15.1	15.1	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	90	102.0	15.5	27.7	16.2	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	104.7	8.7	16.8	10.3	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	141.2	5.7	18.3	16.9	0.8
Lot 1328 - Enriched 250.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	824	215.5	19.0	32.6	19.4	0.8
Non-derivatized - MS/MS non-kit	273	223.8	17.6	32.0	16.2	0.8
Derivatized - MS/MS PE NeoGram Kit	135	227.9	18.2	24.3	20.1	0.8
Non-derivatized - MS/MS PE NeoBase Kit	565	214.1	16.2	26.7	15.1	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	90	160.8	28.1	46.1	16.2	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	176.2	14.1	23.3	10.3	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	222.4	14.5	25.1	16.9	0.8

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

TYROSINE (μmol Tyr/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1325 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	842	50.0	4.1	7.1	50.1	0.8
Non-derivatized - MS/MS non-kit	312	51.2	4.6	8.1	51.6	0.8
Derivatized - MS/MS PE NeoGram Kit	150	51.9	4.6	6.7	50.4	0.8
Non-derivatized - MS/MS PE NeoBase Kit	544	56.0	4.4	7.3	55.0	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	88	56.8	5.7	7.0	58.3	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	76	61.2	4.9	12.8	59.4	1.0
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	52.0	3.1	5.0	53.7	0.8
Lot 1326 - Enriched 200.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	844	211.3	17.5	29.8	50.1	0.8
Non-derivatized - MS/MS non-kit	311	220.1	16.8	31.7	51.6	0.8
Derivatized - MS/MS PE NeoGram Kit	146	215.8	16.8	20.5	50.4	0.8
Non-derivatized - MS/MS PE NeoBase Kit	540	235.9	18.0	30.1	55.0	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	89	244.3	20.9	27.6	58.3	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	76	253.9	17.9	48.9	59.4	1.0
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	39	222.5	11.1	16.7	53.7	0.8
Lot 1327 - Enriched 400.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	842	369.4	28.9	48.3	50.1	0.8
Non-derivatized - MS/MS non-kit	311	390.8	26.6	54.9	51.6	0.8
Derivatized - MS/MS PE NeoGram Kit	148	381.8	28.5	37.9	50.4	0.8
Non-derivatized - MS/MS PE NeoBase Kit	552	414.8	30.6	53.8	55.0	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	89	418.0	34.2	43.1	58.3	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	74	449.8	27.5	74.2	59.4	1.0
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	394.8	18.7	37.0	53.7	0.8
Lot 1328 - Enriched 600.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	859	531.5	45.2	75.1	50.1	0.8
Non-derivatized - MS/MS non-kit	311	556.5	39.3	75.5	51.6	0.8
Derivatized - MS/MS PE NeoGram Kit	146	552.0	43.1	62.8	50.4	0.8
Non-derivatized - MS/MS PE NeoBase Kit	549	600.0	43.8	76.8	55.0	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	89	605.2	48.9	58.7	58.3	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	76	650.0	52.0	124.7	59.4	1.0
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	555.9	38.3	43.5	53.7	0.8

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

VALINE (μmol Val/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1325 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	773	141.8	13.7	28.7	141.1	0.7
Non-derivatized - MS/MS non-kit	217	141.5	11.8	31.2	139.3	0.8
Derivatized - MS/MS PE NeoGram Kit	140	159.3	18.2	24.0	157.7	0.8
Non-derivatized - MS/MS PE NeoBase Kit	546	151.5	12.2	19.7	151.3	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	86	121.6	13.0	18.4	123.8	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	104.5	7.5	23.0	102.1	0.6
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	49	154.7	9.8	29.8	157.8	0.9
Lot 1326 - Enriched 200.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	786	290.4	27.0	51.6	141.1	0.7
Non-derivatized - MS/MS non-kit	219	302.9	23.7	68.1	139.3	0.8
Derivatized - MS/MS PE NeoGram Kit	136	321.1	29.3	36.0	157.7	0.8
Non-derivatized - MS/MS PE NeoBase Kit	547	330.2	29.7	51.9	151.3	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	89	254.2	25.6	32.7	123.8	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	223.9	12.1	39.4	102.1	0.6
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	338.8	21.7	62.2	157.8	0.9
Lot 1327 - Enriched 350.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	782	395.4	35.4	71.8	141.1	0.7
Non-derivatized - MS/MS non-kit	220	416.3	38.9	97.7	139.3	0.8
Derivatized - MS/MS PE NeoGram Kit	137	444.3	52.5	61.3	157.7	0.8
Non-derivatized - MS/MS PE NeoBase Kit	547	463.3	38.4	63.0	151.3	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	90	348.1	34.9	51.7	123.8	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	315.6	20.9	62.8	102.1	0.6
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	468.1	18.8	82.3	157.8	0.9
Lot 1328 - Enriched 500.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	792	514.1	49.5	94.4	141.1	0.7
Non-derivatized - MS/MS non-kit	220	552.4	48.2	129.5	139.3	0.8
Derivatized - MS/MS PE NeoGram Kit	138	572.3	57.4	74.9	157.7	0.8
Non-derivatized - MS/MS PE NeoBase Kit	545	599.1	54.5	90.6	151.3	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	86	440.5	43.6	68.1	123.8	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	415.7	34.9	80.5	102.1	0.6
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	596.6	41.0	91.6	157.8	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

CITRULLINE (μmol Cit/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1325 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	803	26.1	2.7	5.7	28.0	0.8
Non-derivatized - MS/MS non-kit	217	28.9	3.4	4.9	30.1	0.9
Derivatized - MS/MS PE NeoGram Kit	140	26.9	2.3	3.2	27.5	0.8
Non-derivatized - MS/MS PE NeoBase Kit	547	28.7	2.8	3.5	30.0	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	84	28.2	2.9	5.7	29.7	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	29.4	3.4	5.3	30.4	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	27.4	1.9	3.1	29.1	0.8
Lot 1326 - Enriched 25.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	817	47.5	4.9	11.3	28.0	0.8
Non-derivatized - MS/MS non-kit	213	52.3	5.3	9.2	30.1	0.9
Derivatized - MS/MS PE NeoGram Kit	137	47.4	3.4	4.9	27.5	0.8
Non-derivatized - MS/MS PE NeoBase Kit	540	52.3	4.5	5.8	30.0	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	89	53.3	6.0	12.2	29.7	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	50.9	4.4	7.8	30.4	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	49.8	3.9	5.8	29.1	0.8
Lot 1327 - Enriched 100.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	812	106.9	10.1	23.5	28.0	0.8
Non-derivatized - MS/MS non-kit	216	117.9	12.5	20.6	30.1	0.9
Derivatized - MS/MS PE NeoGram Kit	140	108.8	8.4	12.1	27.5	0.8
Non-derivatized - MS/MS PE NeoBase Kit	544	118.5	8.6	11.8	30.0	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	80	110.2	11.6	16.5	29.7	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	115.5	8.1	12.9	30.4	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	112.9	6.5	11.2	29.1	0.8
Lot 1328 - Enriched 250.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	810	217.7	20.2	45.8	28.0	0.8
Non-derivatized - MS/MS non-kit	214	246.5	21.5	35.8	30.1	0.9
Derivatized - MS/MS PE NeoGram Kit	150	227.7	15.0	27.5	27.5	0.8
Non-derivatized - MS/MS PE NeoBase Kit	550	247.6	19.4	27.2	30.0	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	85	237.6	19.8	48.6	29.7	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	236.9	19.1	33.5	30.4	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	231.8	12.9	16.1	29.1	0.8

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

ARGININE (μmol Arg/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1325 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	685	8.5	1.6	4.7	8.6	0.6
Non-derivatized - MS/MS non-kit	145	6.8	1.1	2.6	5.6	0.7
Derivatized - MS/MS PE NeoGram Kit	125	8.3	1.2	2.0	7.6	0.7
Non-derivatized - MS/MS PE NeoBase Kit	471	7.8	0.9	1.9	7.2	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	80	10.8	1.8	3.1	11.8	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	7.5	0.8	2.1	9.5	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	30	5.1	0.5	1.6	5.1	0.5
Lot 1326 - Enriched 100.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	713	67.4	7.8	31.7	8.6	0.6
Non-derivatized - MS/MS non-kit	144	69.0	8.6	20.8	5.6	0.7
Derivatized - MS/MS PE NeoGram Kit	123	79.6	5.6	10.5	7.6	0.7
Non-derivatized - MS/MS PE NeoBase Kit	466	90.0	6.4	10.5	7.2	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	89	106.5	9.4	25.7	11.8	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	79.6	7.7	13.6	9.5	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	30	51.8	3.8	4.7	5.1	0.5
Lot 1327 - Enriched 200.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	707	127.6	13.1	60.2	8.6	0.6
Non-derivatized - MS/MS non-kit	144	133.7	18.1	42.8	5.6	0.7
Derivatized - MS/MS PE NeoGram Kit	124	156.6	12.6	22.0	7.6	0.7
Non-derivatized - MS/MS PE NeoBase Kit	468	175.3	12.1	19.1	7.2	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	90	199.1	21.2	47.5	11.8	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	147.7	10.4	26.0	9.5	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	30	100.9	6.4	8.8	5.1	0.5
Lot 1328 - Enriched 300.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	705	185.6	19.4	85.8	8.6	0.6
Non-derivatized - MS/MS non-kit	144	200.8	24.1	62.2	5.6	0.7
Derivatized - MS/MS PE NeoGram Kit	126	228.7	20.7	38.4	7.6	0.7
Non-derivatized - MS/MS PE NeoBase Kit	480	258.9	19.0	31.4	7.2	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	90	291.6	26.3	69.3	11.8	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	211.8	19.0	34.9	9.5	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	30	146.4	11.8	13.0	5.1	0.5

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

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ALANINE (μmol Ala/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1325 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	645	282.9	27.6	81.8	289.7	0.6
Non-derivatized - MS/MS non-kit	148	329.7	29.3	81.2	332.4	0.6
Derivatized - MS/MS PE NeoGram Kit	78	340.5	31.6	65.8	342.9	0.7
Non-derivatized - MS/MS PE NeoBase Kit	385	384.2	32.3	71.8	395.4	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	89	293.4	26.6	41.2	298.9	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	263.3	19.7	67.7	266.1	0.5
Lot 1326 - Enriched 200.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	651	411.9	41.3	115.7	289.7	0.6
Non-derivatized - MS/MS non-kit	150	467.8	38.7	116.9	332.4	0.6
Derivatized - MS/MS PE NeoGram Kit	80	481.2	43.4	117.6	342.9	0.7
Non-derivatized - MS/MS PE NeoBase Kit	395	563.4	43.7	99.3	395.4	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	89	425.6	36.6	64.2	298.9	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	379.0	22.4	97.1	266.1	0.5
Lot 1327 - Enriched 400.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	650	522.6	50.4	142.6	289.7	0.6
Non-derivatized - MS/MS non-kit	149	583.9	51.1	150.8	332.4	0.6
Derivatized - MS/MS PE NeoGram Kit	80	623.9	79.5	151.6	342.9	0.7
Non-derivatized - MS/MS PE NeoBase Kit	395	722.6	53.7	127.9	395.4	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	87	531.0	48.8	69.9	298.9	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	484.3	31.3	123.5	266.1	0.5
Lot 1328 - Enriched 600.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	651	626.9	60.4	173.3	289.7	0.6
Non-derivatized - MS/MS non-kit	149	719.4	65.8	172.4	332.4	0.6
Derivatized - MS/MS PE NeoGram Kit	80	751.7	72.5	184.1	342.9	0.7
Non-derivatized - MS/MS PE NeoBase Kit	396	856.7	67.0	157.2	395.4	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	87	648.9	52.6	94.6	298.9	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	590.9	46.0	145.6	266.1	0.5

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

SUCCINYLACETONE (μmol SUAC/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1325 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	219	0.8	0.2	0.5	0.8	0.5
Non-derivatized - MS/MS non-kit	80	1.5	0.6	1.3	1.7	0.6
Non-derivatized - MS/MS PE NeoBase Kit	317	0.5	0.1	0.3	0.5	0.2
Derivatized - MS/MS Chromsystems MassChrom Kit	40	0.6	0.2	0.5	0.7	0.3
Lot 1326 - Enriched 2.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	216	2.0	0.3	1.0	0.8	0.5
Non-derivatized - MS/MS non-kit	80	3.1	0.6	1.8	1.7	0.6
Non-derivatized - MS/MS PE NeoBase Kit	313	1.0	0.2	0.4	0.5	0.2
Derivatized - MS/MS Chromsystems MassChrom Kit	40	1.4	0.5	0.7	0.7	0.3
Lot 1327 - Enriched 7.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	218	4.6	0.5	2.7	0.8	0.5
Non-derivatized - MS/MS non-kit	80	6.3	1.4	3.9	1.7	0.6
Non-derivatized - MS/MS PE NeoBase Kit	311	1.9	0.3	0.7	0.5	0.2
Derivatized - MS/MS Chromsystems MassChrom Kit	39	2.7	0.5	0.9	0.7	0.3
Lot 1328 - Enriched 15.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	218	8.2	1.0	5.0	0.8	0.5
Non-derivatized - MS/MS non-kit	79	10.3	2.1	6.6	1.7	0.6
Non-derivatized - MS/MS PE NeoBase Kit	319	3.3	0.4	1.1	0.5	0.2
Derivatized - MS/MS Chromsystems MassChrom Kit	40	4.6	0.7	1.2	0.7	0.3

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

FREE CARNITINE (μmol C0/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	915	18.49	2.01	3.72	15.80	1.3
Non-derivatized - MS/MS non-kit	241	16.97	1.52	3.24	14.53	0.9
Derivatized - MS/MS PE NeoGram Kit	150	21.71	2.37	4.36	18.64	1.6
Non-derivatized - MS/MS PE NeoBase Kit	553	16.32	1.48	2.43	14.05	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	104	16.86	2.99	4.24	14.71	1.0
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	14.16	1.12	2.28	11.94	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	57	16.99	0.95	2.30	14.43	1.0
Lot 1366 - Enriched 10.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	904	24.80	2.44	4.89	15.80	1.3
Non-derivatized - MS/MS non-kit	242	20.14	1.88	3.61	14.53	0.9
Derivatized - MS/MS PE NeoGram Kit	150	30.80	2.92	5.52	18.64	1.6
Non-derivatized - MS/MS PE NeoBase Kit	538	19.32	1.47	2.63	14.05	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	107	21.46	2.77	5.74	14.71	1.0
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	16.42	1.17	2.62	11.94	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	60	20.06	1.15	2.20	14.43	1.0
Lot 1367 - Enriched 20.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	916	40.99	4.11	8.24	15.80	1.3
Non-derivatized - MS/MS non-kit	240	33.04	2.56	5.54	14.53	0.9
Derivatized - MS/MS PE NeoGram Kit	150	50.31	5.36	9.82	18.64	1.6
Non-derivatized - MS/MS PE NeoBase Kit	551	32.97	2.65	4.69	14.05	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	107	35.40	4.42	7.75	14.71	1.0
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	28.30	2.09	4.91	11.94	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	60	34.59	2.28	4.95	14.43	1.0
Lot 1368 - Enriched 30.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	921	55.86	5.39	11.65	15.80	1.3
Non-derivatized - MS/MS non-kit	239	43.54	3.50	7.60	14.53	0.9
Derivatized - MS/MS PE NeoGram Kit	149	69.56	6.69	13.62	18.64	1.6
Non-derivatized - MS/MS PE NeoBase Kit	539	42.25	3.49	6.05	14.05	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	105	45.89	6.54	10.49	14.71	1.0
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	36.84	2.22	6.03	11.94	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	60	44.27	3.50	5.51	14.43	1.0

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

ACETYLCARNITINE (μmol C2/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	859	12.62	1.49	3.71	12.48	0.9
Non-derivatized - MS/MS non-kit	213	10.77	0.87	1.93	10.56	1.0
Derivatized - MS/MS PE NeoGram Kit	147	13.11	1.03	1.76	13.01	0.8
Non-derivatized - MS/MS PE NeoBase Kit	547	9.75	0.70	1.24	9.70	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	102	11.06	1.18	2.05	11.15	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	9.06	0.63	0.82	8.86	0.9
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	11.71	0.79	1.56	11.86	1.1
Lot 1366 - Enriched 10.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	853	21.95	2.26	5.16	12.48	0.9
Non-derivatized - MS/MS non-kit	210	20.92	1.70	2.93	10.56	1.0
Derivatized - MS/MS PE NeoGram Kit	149	20.52	1.38	2.10	13.01	0.8
Non-derivatized - MS/MS PE NeoBase Kit	549	18.91	1.21	2.15	9.70	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	110	20.89	1.77	2.99	11.15	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	17.60	1.16	1.80	8.86	0.9
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	22.97	1.14	3.16	11.86	1.1
Lot 1367 - Enriched 20.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	864	30.69	3.36	7.33	12.48	0.9
Non-derivatized - MS/MS non-kit	207	30.65	2.67	4.66	10.56	1.0
Derivatized - MS/MS PE NeoGram Kit	146	27.65	2.13	3.14	13.01	0.8
Non-derivatized - MS/MS PE NeoBase Kit	533	27.89	1.88	2.94	9.70	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	108	29.60	2.55	4.15	11.15	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	26.73	1.70	2.54	8.86	0.9
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	34.40	2.01	6.00	11.86	1.1
Lot 1368 - Enriched 30.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	857	41.02	4.16	9.57	12.48	0.9
Non-derivatized - MS/MS non-kit	213	42.04	3.32	6.57	10.56	1.0
Derivatized - MS/MS PE NeoGram Kit	147	35.72	2.64	4.00	13.01	0.8
Non-derivatized - MS/MS PE NeoBase Kit	535	37.40	2.51	4.37	9.70	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	108	39.55	3.67	4.49	11.15	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	35.99	2.04	3.08	8.86	0.9
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	44.84	3.04	4.93	11.86	1.1

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

PROPIONYLCARNITINE (μmol C3/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	873	1.28	0.18	0.30	1.21	0.9
Non-derivatized - MS/MS non-kit	228	1.25	0.14	0.25	1.24	0.9
Derivatized - MS/MS PE NeoGram Kit	143	1.05	0.11	0.15	1.02	0.8
Non-derivatized - MS/MS PE NeoBase Kit	546	1.03	0.08	0.13	1.03	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	96	1.19	0.17	0.22	1.15	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	63	1.00	0.07	0.09	0.95	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	1.31	0.08	0.11	1.36	1.0
Lot 1366 - Enriched 3.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	871	4.00	0.49	0.81	1.21	0.9
Non-derivatized - MS/MS non-kit	227	4.05	0.44	0.61	1.24	0.9
Derivatized - MS/MS PE NeoGram Kit	146	3.41	0.26	0.35	1.02	0.8
Non-derivatized - MS/MS PE NeoBase Kit	563	3.43	0.21	0.37	1.03	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	99	3.60	0.41	0.44	1.15	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	3.29	0.19	0.29	0.95	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	4.39	0.24	0.34	1.36	1.0
Lot 1367 - Enriched 7.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	877	7.85	0.96	1.53	1.21	0.9
Non-derivatized - MS/MS non-kit	227	7.87	0.79	1.18	1.24	0.9
Derivatized - MS/MS PE NeoGram Kit	148	6.74	0.53	0.77	1.02	0.8
Non-derivatized - MS/MS PE NeoBase Kit	563	6.88	0.50	0.79	1.03	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	97	7.26	0.74	0.83	1.15	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	6.69	0.44	0.57	0.95	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	8.79	0.54	1.18	1.36	1.0
Lot 1368 - Enriched 12.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	905	12.38	1.43	3.05	1.21	0.9
Non-derivatized - MS/MS non-kit	228	12.28	1.13	1.64	1.24	0.9
Derivatized - MS/MS PE NeoGram Kit	148	10.48	0.81	1.17	1.02	0.8
Non-derivatized - MS/MS PE NeoBase Kit	552	10.51	0.65	1.29	1.03	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	95	11.06	1.11	1.24	1.15	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	10.38	0.60	0.77	0.95	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	13.23	0.92	1.01	1.36	1.0

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

MALONYLCARNITINE (μmol C3DC/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	797	0.03	0.02	0.03	0.04	0.5
Derivatized - MS/MS PE NeoGram Kit	122	0.03	0.01	0.01	0.03	1.3
Derivatized - MS/MS Chromsystems MassChrom Kit	87	0.05	0.02	0.03	0.06	0.7
Lot 1366 - Enriched 0.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	796	0.31	0.07	0.13	0.04	0.5
Derivatized - MS/MS PE NeoGram Kit	123	0.70	0.07	0.13	0.03	1.3
Derivatized - MS/MS Chromsystems MassChrom Kit	89	0.42	0.09	0.17	0.06	0.7
Lot 1367 - Enriched 1.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	784	0.81	0.13	0.25	0.04	0.5
Derivatized - MS/MS PE NeoGram Kit	125	1.91	0.18	0.40	0.03	1.3
Derivatized - MS/MS Chromsystems MassChrom Kit	87	1.08	0.18	0.36	0.06	0.7
Lot 1368 - Enriched 3.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	779	1.59	0.26	0.50	0.04	0.5
Derivatized - MS/MS PE NeoGram Kit	123	3.92	0.37	0.75	0.03	1.3
Derivatized - MS/MS Chromsystems MassChrom Kit	85	2.14	0.36	0.68	0.06	0.7

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

MALONYLCARNITINE + HYDROXYBUTYRYLCARNITINE
(µmol C3DC+C4OH/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 µmol/L whole blood						
Non-derivatized - MS/MS non-kit	94	0.15	0.04	0.08	0.18	0.6
Non-derivatized - MS/MS PE NeoBase Kit	430	0.10	0.02	0.06	0.10	0.4
Non-derivatized - MS/MS Chromsystems MassChrom Kit	39	0.22	0.12	0.26	0.18	0.7
Lot 1366 - Enriched 1.0 µmol/L whole blood						
Non-derivatized - MS/MS non-kit	97	0.78	0.12	0.49	0.18	0.6
Non-derivatized - MS/MS PE NeoBase Kit	448	0.55	0.05	0.35	0.10	0.4
Non-derivatized - MS/MS Chromsystems MassChrom Kit	40	0.90	0.12	1.04	0.18	0.7
Lot 1367 - Enriched 2.5 µmol/L whole blood						
Non-derivatized - MS/MS non-kit	96	1.52	0.20	0.98	0.18	0.6
Non-derivatized - MS/MS PE NeoBase Kit	426	0.94	0.08	0.54	0.10	0.4
Non-derivatized - MS/MS Chromsystems MassChrom Kit	40	1.92	0.36	2.26	0.18	0.7
Lot 1368 - Enriched 5.5 µmol/L whole blood						
Non-derivatized - MS/MS non-kit	94	3.21	0.36	1.87	0.18	0.6
Non-derivatized - MS/MS PE NeoBase Kit	442	2.23	0.17	1.43	0.10	0.4
Non-derivatized - MS/MS Chromsystems MassChrom Kit	40	4.17	0.21	4.65	0.18	0.7

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

BUTYRYLCARNITINE (μmol C4/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	877	0.19	0.04	0.06	0.17	0.8
Non-derivatized - MS/MS non-kit	196	0.17	0.03	0.04	0.15	0.9
Derivatized - MS/MS PE NeoGram Kit	136	0.18	0.04	0.04	0.16	0.7
Non-derivatized - MS/MS PE NeoBase Kit	530	0.16	0.02	0.04	0.15	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	92	0.16	0.04	0.05	0.10	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	0.14	0.01	0.01	0.10	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	0.15	0.01	0.03	0.14	0.8
Lot 1366 - Enriched 1.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	867	1.00	0.14	0.19	0.17	0.8
Non-derivatized - MS/MS non-kit	200	1.03	0.11	0.14	0.15	0.9
Derivatized - MS/MS PE NeoGram Kit	137	0.91	0.15	0.17	0.16	0.7
Non-derivatized - MS/MS PE NeoBase Kit	536	0.91	0.07	0.10	0.15	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	90	0.88	0.14	0.15	0.10	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	0.81	0.06	0.08	0.10	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	0.91	0.06	0.16	0.14	0.8
Lot 1367 - Enriched 2.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	882	2.14	0.26	0.43	0.17	0.8
Non-derivatized - MS/MS non-kit	201	2.21	0.19	0.29	0.15	0.9
Derivatized - MS/MS PE NeoGram Kit	136	1.97	0.23	0.27	0.16	0.7
Non-derivatized - MS/MS PE NeoBase Kit	540	2.00	0.14	0.22	0.15	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	93	1.89	0.23	0.39	0.10	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	1.84	0.11	0.14	0.10	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	2.09	0.10	0.33	0.14	0.8
Lot 1368 - Enriched 5.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	880	4.27	0.48	0.79	0.17	0.8
Non-derivatized - MS/MS non-kit	199	4.45	0.33	0.55	0.15	0.9
Derivatized - MS/MS PE NeoGram Kit	137	3.91	0.47	0.58	0.16	0.7
Non-derivatized - MS/MS PE NeoBase Kit	527	3.93	0.24	0.40	0.15	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	97	4.00	0.56	0.58	0.10	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	3.71	0.22	0.30	0.10	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	4.04	0.28	0.65	0.14	0.8

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

HYDROXYBUTYRYLCARNITINE (μmol C4OH/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	703	0.11	0.03	0.04	0.11	0.6
Derivatized - MS/MS PE NeoGram Kit	108	0.12	0.03	0.05	0.13	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	66	0.11	0.03	0.04	0.11	0.7
Lot 1366 - Enriched 0.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	695	0.43	0.07	0.11	0.11	0.6
Derivatized - MS/MS PE NeoGram Kit	109	0.50	0.09	0.19	0.13	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	66	0.44	0.06	0.08	0.11	0.7
Lot 1367 - Enriched 1.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	702	0.75	0.11	0.20	0.11	0.6
Derivatized - MS/MS PE NeoGram Kit	100	0.82	0.13	0.25	0.13	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	68	0.81	0.12	0.16	0.11	0.7
Lot 1368 - Enriched 2.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	718	1.72	0.23	0.44	0.11	0.6
Derivatized - MS/MS PE NeoGram Kit	106	1.92	0.28	0.76	0.13	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	67	1.82	0.24	0.30	0.11	0.7

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

ISOVALERYLCARNITINE (µmol C5/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 µmol/L whole blood						
Derivatized - MS/MS non-kit	915	0.11	0.02	0.03	0.11	0.9
Non-derivatized - MS/MS non-kit	254	0.09	0.01	0.01	0.08	0.9
Derivatized - MS/MS PE NeoGram Kit	145	0.09	0.02	0.02	0.10	0.8
Non-derivatized - MS/MS PE NeoBase Kit	557	0.09	0.01	0.02	0.08	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	97	0.12	0.03	0.05	0.11	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	0.08	0.01	0.02	0.07	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.10	0.01	0.02	0.12	0.9
Lot 1366 - Enriched 0.5 µmol/L whole blood						
Derivatized - MS/MS non-kit	906	0.54	0.07	0.10	0.11	0.9
Non-derivatized - MS/MS non-kit	262	0.54	0.05	0.07	0.08	0.9
Derivatized - MS/MS PE NeoGram Kit	143	0.51	0.07	0.09	0.10	0.8
Non-derivatized - MS/MS PE NeoBase Kit	565	0.49	0.03	0.06	0.08	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	91	0.54	0.06	0.07	0.11	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	0.45	0.03	0.09	0.07	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.58	0.04	0.08	0.12	0.9
Lot 1367 - Enriched 1.5 µmol/L whole blood						
Derivatized - MS/MS non-kit	910	1.38	0.15	0.23	0.11	0.9
Non-derivatized - MS/MS non-kit	261	1.40	0.12	0.21	0.08	0.9
Derivatized - MS/MS PE NeoGram Kit	150	1.30	0.18	0.23	0.10	0.8
Non-derivatized - MS/MS PE NeoBase Kit	570	1.27	0.09	0.18	0.08	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	96	1.39	0.17	0.23	0.11	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	1.21	0.09	0.22	0.07	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	1.52	0.09	0.27	0.12	0.9
Lot 1368 - Enriched 3.0 µmol/L whole blood						
Derivatized - MS/MS non-kit	928	2.69	0.30	0.45	0.11	0.9
Non-derivatized - MS/MS non-kit	258	2.77	0.21	0.32	0.08	0.9
Derivatized - MS/MS PE NeoGram Kit	148	2.50	0.30	0.38	0.10	0.8
Non-derivatized - MS/MS PE NeoBase Kit	570	2.49	0.16	0.37	0.08	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	98	2.73	0.37	0.39	0.11	0.9
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	2.36	0.14	0.45	0.07	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	2.85	0.20	0.34	0.12	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

GLUTARYLCARNITINE (μmol C5DC/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	896	0.02	0.01	0.02	0.03	0.6
Non-derivatized - MS/MS non-kit	243	0.05	0.02	0.03	0.05	0.8
Derivatized - MS/MS PE NeoGram Kit	135	0.03	0.01	0.01	0.03	1.0
Non-derivatized - MS/MS PE NeoBase Kit	532	0.05	0.02	0.03	0.06	1.0
Derivatized - MS/MS Chromsystems MassChrom Kit	96	0.05	0.02	0.05	0.06	1.3
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	0.08	0.02	0.03	0.07	1.4
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.07	0.01	0.01	0.08	0.9
Lot 1366 - Enriched 0.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	896	0.32	0.06	0.14	0.03	0.6
Non-derivatized - MS/MS non-kit	249	0.48	0.06	0.18	0.05	0.8
Derivatized - MS/MS PE NeoGram Kit	144	0.53	0.04	0.06	0.03	1.0
Non-derivatized - MS/MS PE NeoBase Kit	530	0.53	0.05	0.09	0.06	1.0
Derivatized - MS/MS Chromsystems MassChrom Kit	97	0.71	0.15	0.16	0.06	1.3
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	0.78	0.08	0.17	0.07	1.4
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.55	0.03	0.08	0.08	0.9
Lot 1367 - Enriched 1.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	907	0.59	0.09	0.25	0.03	0.6
Non-derivatized - MS/MS non-kit	248	0.90	0.10	0.34	0.05	0.8
Derivatized - MS/MS PE NeoGram Kit	145	0.99	0.09	0.13	0.03	1.0
Non-derivatized - MS/MS PE NeoBase Kit	533	1.01	0.09	0.18	0.06	1.0
Derivatized - MS/MS Chromsystems MassChrom Kit	96	1.37	0.22	0.28	0.06	1.3
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	1.50	0.13	0.36	0.07	1.4
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	1.04	0.07	0.18	0.08	0.9
Lot 1368 - Enriched 2.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	909	1.44	0.20	0.59	0.03	0.6
Non-derivatized - MS/MS non-kit	250	2.16	0.20	0.81	0.05	0.8
Derivatized - MS/MS PE NeoGram Kit	145	2.47	0.21	0.31	0.03	1.0
Non-derivatized - MS/MS PE NeoBase Kit	533	2.42	0.19	0.40	0.06	1.0
Derivatized - MS/MS Chromsystems MassChrom Kit	93	3.29	0.46	0.56	0.06	1.3
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	3.65	0.36	0.90	0.07	1.4
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	2.43	0.15	0.32	0.08	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

HYDROXYISOVALERYLCARNITINE (μmol C5OH/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	901	0.45	0.06	0.10	0.45	0.8
Non-derivatized - MS/MS non-kit	219	0.57	0.05	0.13	0.57	0.7
Derivatized - MS/MS PE NeoGram Kit	148	0.42	0.07	0.08	0.42	0.7
Non-derivatized - MS/MS PE NeoBase Kit	441	0.47	0.04	0.11	0.46	0.5
Derivatized - MS/MS Chromsystems MassChrom Kit	88	0.45	0.08	0.10	0.45	0.7
Non-derivatized - MS/MS Chromsystems MassChrom Kit	58	0.76	0.08	1.24	0.78	1.2
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.66	0.04	0.06	0.68	0.9
Lot 1366 - Enriched 0.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	892	0.84	0.11	0.17	0.45	0.8
Non-derivatized - MS/MS non-kit	222	0.96	0.07	0.22	0.57	0.7
Derivatized - MS/MS PE NeoGram Kit	149	0.79	0.12	0.16	0.42	0.7
Non-derivatized - MS/MS PE NeoBase Kit	450	0.74	0.05	0.17	0.46	0.5
Derivatized - MS/MS Chromsystems MassChrom Kit	87	0.81	0.14	0.18	0.45	0.7
Non-derivatized - MS/MS Chromsystems MassChrom Kit	60	1.38	0.13	2.02	0.78	1.2
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	1.15	0.07	0.11	0.68	0.9
Lot 1367 - Enriched 1.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	898	1.58	0.19	0.31	0.45	0.8
Non-derivatized - MS/MS non-kit	222	1.63	0.16	0.42	0.57	0.7
Derivatized - MS/MS PE NeoGram Kit	147	1.44	0.18	0.27	0.42	0.7
Non-derivatized - MS/MS PE NeoBase Kit	455	1.26	0.08	0.29	0.46	0.5
Derivatized - MS/MS Chromsystems MassChrom Kit	84	1.49	0.19	0.25	0.45	0.7
Non-derivatized - MS/MS Chromsystems MassChrom Kit	60	2.57	0.32	3.93	0.78	1.2
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	2.07	0.11	0.22	0.68	0.9
Lot 1368 - Enriched 2.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	898	2.41	0.29	0.48	0.45	0.8
Non-derivatized - MS/MS non-kit	221	2.44	0.19	0.60	0.57	0.7
Derivatized - MS/MS PE NeoGram Kit	150	2.17	0.30	0.41	0.42	0.7
Non-derivatized - MS/MS PE NeoBase Kit	450	1.83	0.14	0.43	0.46	0.5
Derivatized - MS/MS Chromsystems MassChrom Kit	87	2.23	0.29	0.40	0.45	0.7
Non-derivatized - MS/MS Chromsystems MassChrom Kit	60	3.71	0.25	5.58	0.78	1.2
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	2.96	0.19	0.39	0.68	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

HEXANOYLCARNITINE (μmol C6/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	877	0.04	0.02	0.03	0.04	0.8
Non-derivatized - MS/MS non-kit	213	0.02	0.01	0.01	0.02	0.8
Derivatized - MS/MS PE NeoGram Kit	142	0.04	0.02	0.02	0.08	0.6
Non-derivatized - MS/MS PE NeoBase Kit	509	0.03	0.01	0.01	0.03	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	95	0.06	0.04	0.06	0.08	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	0.02	0.00	0.01	0.02	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	39	0.02	0.00	0.00	0.02	0.7
Lot 1366 - Enriched 0.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	868	0.42	0.06	0.10	0.04	0.8
Non-derivatized - MS/MS non-kit	222	0.44	0.05	0.09	0.02	0.8
Derivatized - MS/MS PE NeoGram Kit	142	0.39	0.06	0.06	0.08	0.6
Non-derivatized - MS/MS PE NeoBase Kit	535	0.41	0.03	0.05	0.03	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	92	0.41	0.08	0.09	0.08	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	0.39	0.03	0.04	0.02	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	0.39	0.03	0.06	0.02	0.7
Lot 1367 - Enriched 1.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	906	0.78	0.10	0.19	0.04	0.8
Non-derivatized - MS/MS non-kit	226	0.83	0.09	0.18	0.02	0.8
Derivatized - MS/MS PE NeoGram Kit	149	0.67	0.09	0.11	0.08	0.6
Non-derivatized - MS/MS PE NeoBase Kit	541	0.76	0.06	0.09	0.03	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	93	0.68	0.12	0.16	0.08	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	0.73	0.05	0.07	0.02	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	0.76	0.05	0.13	0.02	0.7
Lot 1368 - Enriched 2.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	880	1.91	0.23	0.44	0.04	0.8
Non-derivatized - MS/MS non-kit	223	2.06	0.19	0.39	0.02	0.8
Derivatized - MS/MS PE NeoGram Kit	148	1.48	0.18	0.24	0.08	0.6
Non-derivatized - MS/MS PE NeoBase Kit	530	1.87	0.13	0.23	0.03	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	97	1.59	0.28	0.31	0.08	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	1.83	0.09	0.17	0.02	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	1.87	0.13	0.36	0.02	0.7

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

OCTANOYLCARNITINE (μmol C8/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	905	0.04	0.02	0.03	0.03	0.9
Non-derivatized - MS/MS non-kit	278	0.03	0.01	0.02	0.03	1.0
Derivatized - MS/MS PE NeoGram Kit	144	0.03	0.02	0.02	0.04	0.9
Non-derivatized - MS/MS PE NeoBase Kit	552	0.03	0.01	0.01	0.03	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	95	0.04	0.02	0.04	0.03	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	76	0.03	0.01	0.01	0.02	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.04	0.00	0.01	0.05	0.9
Lot 1366 - Enriched 0.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	889	0.50	0.07	0.12	0.03	0.9
Non-derivatized - MS/MS non-kit	281	0.51	0.05	0.08	0.03	1.0
Derivatized - MS/MS PE NeoGram Kit	144	0.49	0.08	0.08	0.04	0.9
Non-derivatized - MS/MS PE NeoBase Kit	563	0.47	0.04	0.06	0.03	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	94	0.46	0.06	0.08	0.03	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	80	0.40	0.03	0.04	0.02	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.52	0.03	0.08	0.05	0.9
Lot 1367 - Enriched 1.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	899	0.93	0.11	0.20	0.03	0.9
Non-derivatized - MS/MS non-kit	272	0.98	0.08	0.13	0.03	1.0
Derivatized - MS/MS PE NeoGram Kit	146	0.89	0.15	0.17	0.04	0.9
Non-derivatized - MS/MS PE NeoBase Kit	568	0.92	0.07	0.12	0.03	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	96	0.85	0.13	0.15	0.03	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	80	0.79	0.06	0.09	0.02	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.99	0.06	0.20	0.05	0.9
Lot 1368 - Enriched 2.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	901	2.34	0.28	0.43	0.03	0.9
Non-derivatized - MS/MS non-kit	276	2.43	0.20	0.30	0.03	1.0
Derivatized - MS/MS PE NeoGram Kit	146	2.24	0.31	0.36	0.04	0.9
Non-derivatized - MS/MS PE NeoBase Kit	556	2.26	0.16	0.28	0.03	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	99	2.14	0.24	0.26	0.03	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	76	1.96	0.13	0.23	0.02	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	2.38	0.18	0.29	0.05	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

DECANOYLCARNITINE (µmol C10/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 µmol/L whole blood						
Derivatized - MS/MS non-kit	877	0.03	0.02	0.02	0.02	0.9
Non-derivatized - MS/MS non-kit	257	0.02	0.01	0.01	0.00	1.0
Derivatized - MS/MS PE NeoGram Kit	143	0.02	0.01	0.02	0.02	0.7
Non-derivatized - MS/MS PE NeoBase Kit	550	0.02	0.01	0.01	0.00	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	97	0.03	0.02	0.03	0.01	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	80	0.02	0.01	0.01	-0.01	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.02	0.00	0.01	0.01	1.1
Lot 1366 - Enriched 0.5 µmol/L whole blood						
Derivatized - MS/MS non-kit	882	0.47	0.07	0.11	0.02	0.9
Non-derivatized - MS/MS non-kit	265	0.48	0.06	0.09	0.00	1.0
Derivatized - MS/MS PE NeoGram Kit	146	0.38	0.06	0.07	0.02	0.7
Non-derivatized - MS/MS PE NeoBase Kit	579	0.40	0.03	0.05	0.00	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	89	0.37	0.05	0.05	0.01	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	78	0.35	0.03	0.03	-0.01	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.53	0.04	0.16	0.01	1.1
Lot 1367 - Enriched 1.0 µmol/L whole blood						
Derivatized - MS/MS non-kit	893	0.93	0.13	0.22	0.02	0.9
Non-derivatized - MS/MS non-kit	259	0.96	0.10	0.18	0.00	1.0
Derivatized - MS/MS PE NeoGram Kit	147	0.74	0.12	0.13	0.02	0.7
Non-derivatized - MS/MS PE NeoBase Kit	572	0.79	0.06	0.11	0.00	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	97	0.74	0.10	0.12	0.01	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	80	0.69	0.06	0.07	-0.01	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	1.07	0.07	0.38	0.01	1.1
Lot 1368 - Enriched 2.5 µmol/L whole blood						
Derivatized - MS/MS non-kit	888	2.33	0.30	0.53	0.02	0.9
Non-derivatized - MS/MS non-kit	253	2.46	0.22	0.43	0.00	1.0
Derivatized - MS/MS PE NeoGram Kit	147	1.85	0.22	0.25	0.02	0.7
Non-derivatized - MS/MS PE NeoBase Kit	564	2.04	0.15	0.27	0.00	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	96	1.90	0.25	0.25	0.01	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	79	1.82	0.13	0.19	-0.01	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	2.67	0.21	0.68	0.01	1.1

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

DODECANOYLCARNITINE (μmol C12/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	774	0.04	0.02	0.03	-0.02	1.0
Non-derivatized - MS/MS non-kit	181	0.01	0.01	0.01	-0.04	0.9
Derivatized - MS/MS PE NeoGram Kit	134	0.03	0.02	0.02	-0.01	0.9
Non-derivatized - MS/MS PE NeoBase Kit	491	0.01	0.00	0.01	-0.05	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	97	0.06	0.02	0.04	0.02	1.0
Non-derivatized - MS/MS Chromsystems MassChrom Kit	61	0.01	0.00	0.00	-0.07	0.9
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	37	0.01	0.00	0.00	-0.04	1.0
Lot 1366 - Enriched 0.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	752	0.45	0.07	0.11	-0.02	1.0
Non-derivatized - MS/MS non-kit	178	0.41	0.06	0.11	-0.04	0.9
Derivatized - MS/MS PE NeoGram Kit	134	0.43	0.06	0.08	-0.01	0.9
Non-derivatized - MS/MS PE NeoBase Kit	515	0.38	0.03	0.05	-0.05	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	98	0.48	0.07	0.10	0.02	1.0
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	0.35	0.03	0.04	-0.07	0.9
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	0.43	0.03	0.06	-0.04	1.0
Lot 1367 - Enriched 1.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	774	0.90	0.13	0.23	-0.02	1.0
Non-derivatized - MS/MS non-kit	177	0.80	0.09	0.18	-0.04	0.9
Derivatized - MS/MS PE NeoGram Kit	137	0.87	0.13	0.16	-0.01	0.9
Non-derivatized - MS/MS PE NeoBase Kit	512	0.75	0.06	0.10	-0.05	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	97	0.96	0.14	0.23	0.02	1.0
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	0.69	0.05	0.07	-0.07	0.9
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	0.88	0.06	0.17	-0.04	1.0
Lot 1368 - Enriched 2.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	777	2.46	0.33	0.59	-0.02	1.0
Non-derivatized - MS/MS non-kit	178	2.31	0.25	0.60	-0.04	0.9
Derivatized - MS/MS PE NeoGram Kit	139	2.34	0.26	0.35	-0.01	0.9
Non-derivatized - MS/MS PE NeoBase Kit	514	2.20	0.16	0.29	-0.05	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	97	2.44	0.30	0.38	0.02	1.0
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	2.12	0.13	0.21	-0.07	0.9
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	38	2.43	0.13	0.23	-0.04	1.0

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

MYRISTOYLCARNITINE (μmol C14/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	856	0.06	0.02	0.03	0.04	0.9
Non-derivatized - MS/MS non-kit	210	0.05	0.01	0.01	0.03	0.9
Derivatized - MS/MS PE NeoGram Kit	143	0.06	0.02	0.02	0.05	0.8
Non-derivatized - MS/MS PE NeoBase Kit	511	0.04	0.01	0.01	0.03	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	95	0.08	0.02	0.04	0.07	0.7
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	0.03	0.00	0.01	0.01	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	0.04	0.00	0.01	0.05	0.9
Lot 1366 - Enriched 0.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	867	0.48	0.07	0.11	0.04	0.9
Non-derivatized - MS/MS non-kit	211	0.47	0.05	0.08	0.03	0.9
Derivatized - MS/MS PE NeoGram Kit	144	0.46	0.07	0.08	0.05	0.8
Non-derivatized - MS/MS PE NeoBase Kit	533	0.42	0.03	0.05	0.03	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	94	0.45	0.08	0.11	0.07	0.7
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	0.34	0.03	0.03	0.01	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	0.46	0.03	0.08	0.05	0.9
Lot 1367 - Enriched 1.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	885	1.29	0.16	0.27	0.04	0.9
Non-derivatized - MS/MS non-kit	214	1.31	0.13	0.24	0.03	0.9
Derivatized - MS/MS PE NeoGram Kit	146	1.24	0.16	0.20	0.05	0.8
Non-derivatized - MS/MS PE NeoBase Kit	535	1.19	0.09	0.14	0.03	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	97	1.13	0.13	0.19	0.07	0.7
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	0.99	0.07	0.10	0.01	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	1.36	0.09	0.28	0.05	0.9
Lot 1368 - Enriched 3.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	877	2.67	0.30	0.50	0.04	0.9
Non-derivatized - MS/MS non-kit	215	2.69	0.23	0.46	0.03	0.9
Derivatized - MS/MS PE NeoGram Kit	148	2.51	0.27	0.34	0.05	0.8
Non-derivatized - MS/MS PE NeoBase Kit	528	2.38	0.18	0.29	0.03	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	97	2.31	0.28	0.40	0.07	0.7
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	2.06	0.12	0.19	0.01	0.7
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	38	2.61	0.14	0.27	0.05	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

PALMITOYLCARNITINE (μmol C16/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	894	0.82	0.10	0.15	0.42	0.9
Non-derivatized - MS/MS non-kit	222	0.82	0.08	0.13	0.41	0.9
Derivatized - MS/MS PE NeoGram Kit	146	0.76	0.09	0.10	0.41	0.8
Non-derivatized - MS/MS PE NeoBase Kit	550	0.71	0.06	0.09	0.34	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	98	0.73	0.09	0.11	0.34	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	0.70	0.06	0.07	0.27	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	39	0.80	0.05	0.08	0.46	0.9
Lot 1366 - Enriched 4.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	903	3.33	0.34	0.54	0.42	0.9
Non-derivatized - MS/MS non-kit	228	3.44	0.33	0.53	0.41	0.9
Derivatized - MS/MS PE NeoGram Kit	145	3.20	0.31	0.40	0.41	0.8
Non-derivatized - MS/MS PE NeoBase Kit	558	3.04	0.23	0.32	0.34	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	97	3.01	0.30	0.40	0.34	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	2.96	0.20	0.23	0.27	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	3.42	0.22	0.37	0.46	0.9
Lot 1367 - Enriched 8.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	919	7.47	0.70	1.18	0.42	0.9
Non-derivatized - MS/MS non-kit	228	7.67	0.69	1.34	0.41	0.9
Derivatized - MS/MS PE NeoGram Kit	146	7.17	0.75	0.92	0.41	0.8
Non-derivatized - MS/MS PE NeoBase Kit	560	7.06	0.52	0.78	0.34	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	100	7.08	0.84	1.26	0.34	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	67	6.91	0.42	0.59	0.27	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	40	8.06	0.51	1.30	0.46	0.9
Lot 1368 - Enriched 12.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	909	11.17	1.06	1.59	0.42	0.9
Non-derivatized - MS/MS non-kit	229	11.47	1.03	1.87	0.41	0.9
Derivatized - MS/MS PE NeoGram Kit	149	10.56	1.08	1.39	0.41	0.8
Non-derivatized - MS/MS PE NeoBase Kit	555	10.37	0.74	1.20	0.34	0.8
Derivatized - MS/MS Chromsystems MassChrom Kit	97	10.43	1.05	1.47	0.34	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	10.48	0.65	0.80	0.27	0.8
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	38	11.30	0.71	0.77	0.46	0.9

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

HYDROXYPALMITOYLCARNITINE (μmol C16OH/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	885	0.01	0.01	0.01	0.01	0.6
Non-derivatized - MS/MS non-kit	243	0.01	0.00	0.01	0.01	0.6
Derivatized - MS/MS PE NeoGram Kit	136	0.01	0.01	0.01	0.02	0.6
Non-derivatized - MS/MS PE NeoBase Kit	555	0.01	0.00	0.01	0.01	0.5
Derivatized - MS/MS Chromsystems MassChrom Kit	75	0.02	0.01	0.01	0.01	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	69	0.01	0.00	0.00	0.00	0.5
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.01	0.00	0.00	0.01	0.6
Lot 1366 - Enriched 0.1 μmol/L whole blood						
Derivatized - MS/MS non-kit	897	0.08	0.02	0.03	0.01	0.6
Non-derivatized - MS/MS non-kit	243	0.06	0.01	0.01	0.01	0.6
Derivatized - MS/MS PE NeoGram Kit	137	0.08	0.02	0.03	0.02	0.6
Non-derivatized - MS/MS PE NeoBase Kit	572	0.06	0.01	0.02	0.01	0.5
Derivatized - MS/MS Chromsystems MassChrom Kit	76	0.07	0.02	0.02	0.01	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	67	0.05	0.01	0.01	0.00	0.5
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.06	0.00	0.01	0.01	0.6
Lot 1367 - Enriched 0.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	909	0.33	0.05	0.09	0.01	0.6
Non-derivatized - MS/MS non-kit	250	0.30	0.04	0.06	0.01	0.6
Derivatized - MS/MS PE NeoGram Kit	140	0.33	0.06	0.08	0.02	0.6
Non-derivatized - MS/MS PE NeoBase Kit	541	0.27	0.02	0.04	0.01	0.5
Derivatized - MS/MS Chromsystems MassChrom Kit	75	0.33	0.05	0.05	0.01	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	0.23	0.02	0.03	0.00	0.5
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.31	0.02	0.08	0.01	0.6
Lot 1368 - Enriched 1.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	926	0.65	0.10	0.18	0.01	0.6
Non-derivatized - MS/MS non-kit	251	0.58	0.05	0.12	0.01	0.6
Derivatized - MS/MS PE NeoGram Kit	132	0.59	0.08	0.11	0.02	0.6
Non-derivatized - MS/MS PE NeoBase Kit	544	0.52	0.04	0.08	0.01	0.5
Derivatized - MS/MS Chromsystems MassChrom Kit	78	0.63	0.09	0.09	0.01	0.6
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	0.46	0.03	0.05	0.00	0.5
Non-derivatized - MS2 Screening Neo (MS-Neo) Siemens	50	0.58	0.05	0.11	0.01	0.6

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

STEAROYLCARNITINE (μmol C18/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	854	0.68	0.10	0.15	0.66	0.8
Non-derivatized - MS/MS non-kit	180	0.69	0.07	0.10	0.66	0.9
Derivatized - MS/MS PE NeoGram Kit	135	0.69	0.09	0.10	0.66	0.9
Non-derivatized - MS/MS PE NeoBase Kit	546	0.66	0.06	0.08	0.63	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	99	0.66	0.10	0.18	0.63	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	0.58	0.04	0.06	0.53	0.8
Lot 1366 - Enriched 1.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	857	1.50	0.19	0.33	0.66	0.8
Non-derivatized - MS/MS non-kit	185	1.54	0.14	0.22	0.66	0.9
Derivatized - MS/MS PE NeoGram Kit	139	1.57	0.18	0.23	0.66	0.9
Non-derivatized - MS/MS PE NeoBase Kit	544	1.51	0.11	0.15	0.63	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	100	1.44	0.19	0.32	0.63	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	70	1.30	0.10	0.13	0.53	0.8
Lot 1367 - Enriched 2.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	863	2.27	0.27	0.45	0.66	0.8
Non-derivatized - MS/MS non-kit	185	2.37	0.23	0.39	0.66	0.9
Derivatized - MS/MS PE NeoGram Kit	140	2.39	0.27	0.36	0.66	0.9
Non-derivatized - MS/MS PE NeoBase Kit	549	2.40	0.18	0.24	0.63	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	98	2.27	0.29	0.49	0.63	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	2.07	0.15	0.21	0.53	0.8
Lot 1368 - Enriched 5.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	876	4.81	0.56	1.07	0.66	0.8
Non-derivatized - MS/MS non-kit	186	5.09	0.48	0.94	0.66	0.9
Derivatized - MS/MS PE NeoGram Kit	138	5.17	0.52	0.66	0.66	0.9
Non-derivatized - MS/MS PE NeoBase Kit	539	5.11	0.40	0.53	0.63	0.9
Derivatized - MS/MS Chromsystems MassChrom Kit	98	4.80	0.55	0.97	0.63	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	68	4.54	0.29	0.39	0.53	0.8

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

2014 Quality Control Data
Summaries of Statistical Analyses

HYDROXYSTEAROYLCARNITINE (μmol C18OH/L whole blood)

METHOD	N	Mean	Average Within Lab SD	Total SD	Y-Intercept*	Slope
Lot 1365 - Nonenriched 0 μmol/L whole blood						
Derivatized - MS/MS non-kit	580	0.01	0.01	0.01	0.12	0.8
Non-derivatized - MS/MS non-kit	90	0.01	0.01	0.01	0.10	0.7
Derivatized - MS/MS PE NeoGram Kit	127	0.02	0.01	0.01	0.12	0.8
Non-derivatized - MS/MS PE NeoBase Kit	430	0.00	0.00	0.01	0.10	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	64	0.01	0.00	0.01	0.12	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	56	0.00	0.00	0.00	0.08	0.6
Lot 1366 - Enriched 0.1 μmol/L whole blood						
Derivatized - MS/MS non-kit	595	0.29	0.05	0.13	0.12	0.8
Non-derivatized - MS/MS non-kit	90	0.25	0.04	0.12	0.10	0.7
Derivatized - MS/MS PE NeoGram Kit	122	0.30	0.05	0.07	0.12	0.8
Non-derivatized - MS/MS PE NeoBase Kit	419	0.26	0.02	0.04	0.10	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	67	0.28	0.06	0.07	0.12	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	59	0.20	0.02	0.04	0.08	0.6
Lot 1367 - Enriched 0.5 μmol/L whole blood						
Derivatized - MS/MS non-kit	603	0.55	0.09	0.24	0.12	0.8
Non-derivatized - MS/MS non-kit	90	0.48	0.07	0.24	0.10	0.7
Derivatized - MS/MS PE NeoGram Kit	123	0.56	0.08	0.13	0.12	0.8
Non-derivatized - MS/MS PE NeoBase Kit	426	0.52	0.05	0.07	0.10	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	70	0.57	0.14	0.16	0.12	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	58	0.40	0.03	0.06	0.08	0.6
Lot 1368 - Enriched 1.0 μmol/L whole blood						
Derivatized - MS/MS non-kit	604	0.86	0.13	0.37	0.12	0.8
Non-derivatized - MS/MS non-kit	90	0.72	0.09	0.36	0.10	0.7
Derivatized - MS/MS PE NeoGram Kit	122	0.88	0.12	0.20	0.12	0.8
Non-derivatized - MS/MS PE NeoBase Kit	427	0.79	0.06	0.11	0.10	0.7
Derivatized - MS/MS Chromsystems MassChrom Kit	67	0.84	0.14	0.20	0.12	0.8
Non-derivatized - MS/MS Chromsystems MassChrom Kit	58	0.63	0.04	0.10	0.08	0.6

*Estimated by performing a weighted linear regression analysis of mean reported concentrations versus enriched concentrations and extrapolating the regression to the Y-axis.

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