

**Reference Material: Tandem MS 1**

**Product ID: MSMS1QC-15**

**Expiration Date: July 2025**

Analysis Method: Derivatized – MS/MS non-kit

Material Storage: -20°C ± 10°C

Units: µmol/L blood

<b>Lot</b>	<b>Analyte</b>	<b>Enrichment</b>	<b>Mean Value</b>	<b>95% LL</b>	<b>95% UL</b>
A2415	Alanine (Ala)	0.0	166.5	135.8	197.2
A2415	Arginine (Arg)	0.0	5.7	3.6	7.8
A2415	Citrulline (Cit)	0.0	12.0	9.9	14.1
A2415	Glycine (Gly)	0.0	278.3	210.4	346.1
A2415	Leucine (Leu)	0.0	52.6	40.1	65.1
A2415	Methionine (Met)	0.0	7.3	6.1	8.5
A2415	Ornithine (Orn)	0.0	62.4	43.4	81.5
A2415	Phenylalanine (Phe)	0.0	24.3	19.9	28.7
A2415	Creatine (CRE)	0.0	183.6	155.3	211.9
A2415	Guanidinoacetic Acid (GUAC)	0.0	1.1	0.9	1.3
A2415	Creatinine (CRN)	0.0	28.3	20.9	35.6
A2415	Succinylacetone (SUAC)	0.0	0.64	0.38	0.89
A2415	Tyrosine (Tyr)	0.0	22.3	17.7	27.0
A2415	Valine (Val)	0.0	59.9	28.0	91.9
A2415	Free carnitine (C0)	0.0	16.17	13.27	19.06
A2415	Acetylcarnitine (C2)	0.0	6.19	5.14	7.24
A2415	Propionylcarnitine (C3)	0.0	0.89	0.77	1.00
A2415	Malonylcarnitine (C3DC)	0.0	0.03	0.02	0.04
A2415	Butyrylcarnitine (C4)	0.0	0.09	0.07	0.11
A2415	Hydroxybutyrylcarnitine (C4OH)	0.0	0.07	0.05	0.08
A2415	Isovalerylcarnitine (C5)	0.0	0.06	0.05	0.08
A2415	Tiglyl carnitine (C5:1)	0.0	0.02	0.00	0.03
A2415	Glutaryl carnitine (C5DC)	0.0	0.02	0.01	0.03
A2415	Hydroxyisovalerylcarnitine (C5OH)	0.0	0.34	0.28	0.40
A2415	Hexanoylcarnitine (C6)	0.0	0.02	0.01	0.03
A2415	Octanoylcarnitine (C8)	0.0	0.03	0.00	0.05
A2415	Decanoylcarnitine (C10)	0.0	0.02	0.00	0.03
A2415	Dodecanoylcarnitine (C12)	0.0	0.02	0.01	0.03
A2415	Myristoylcarnitine (C14)	0.0	0.06	0.04	0.07

Lot	Analyte	Enrichment	Mean Value	95% LL	95% UL
A2415	Tetradecenoyl carnitine (C14:1)	0.0	0.02	0.01	0.04
A2415	Palmitoylcarnitine (C16)	0.0	0.81	0.64	0.98
A2415	Hydroxypalmitoylcarnitine (C16OH)	0.0	0.02	0.00	0.04
A2415	Stearoylcarnitine (C18)	0.0	0.62	0.50	0.75
A2415	Hydroxystearoylcarnitine (C18OH)	0.0	0.01	0.00	0.02
B2415	Alanine (Ala)	200.0	319.3	282.5	356.0
B2415	Arginine (Arg)	100.0	68.6	55.6	81.6
B2415	Citrulline (Cit)	25.0	31.3	27.0	35.7
B2415	Glycine (Gly)	300.0	556.7	426.8	686.7
B2415	Leucine (Leu)	150.0	172.3	145.9	198.6
B2415	Methionine (Met)	50.0	44.7	40.2	49.3
B2415	Ornithine (Orn)	100.0	136.5	105.9	167.1
B2415	Phenylalanine (Phe)	150.0	152.0	132.7	171.2
B2415	Creatine (CRE)	50.0	220.3	197.0	243.6
B2415	Guanidinoacetic Acid (GUAC)	5.0	4.8	4.2	5.3
B2415	Creatinine (CRN)	50.0	69.3	61.0	77.6
B2415	Succinylacetone (SUAC)	2.50	1.66	1.29	2.03
B2415	Tyrosine (Tyr)	300.0	256.2	229.5	282.9
B2415	Valine (Val)	200.0	182.3	147.3	217.2
B2415	Free carnitine (C0)	10.00	26.70	23.45	29.94
B2415	Acetylcarnitine (C2)	10.00	15.26	13.59	16.94
B2415	Propionylcarnitine (C3)	4.00	3.98	3.51	4.44
B2415	Malonylcarnitine (C3DC)	0.50	0.34	0.29	0.39
B2415	Butyrylcarnitine (C4)	1.00	0.76	0.67	0.84
B2415	Hydroxybutyrylcarnitine (C4OH)	0.50	0.36	0.32	0.41
B2415	Isovalerylcarnitine (C5)	0.50	0.45	0.39	0.50
B2415	Tiglyl carnitine (C5:1)	0.50	0.37	0.32	0.42
B2415	Glutaryl carnitine (C5DC)	0.50	0.51	0.45	0.57
B2415	Hydroxyisovalerylcarnitine (C5OH)	1.00	1.10	0.97	1.24
B2415	Hexanoylcarnitine (C6)	0.50	0.30	0.25	0.35
B2415	Octanoylcarnitine (C8)	0.50	0.43	0.37	0.50
B2415	Decanoylcarnitine (C10)	0.50	0.42	0.35	0.49
B2415	Dodecanoylcarnitine (C12)	1.00	0.79	0.64	0.93
B2415	Myristoylcarnitine (C14)	0.50	0.41	0.34	0.48
B2415	Tetradecenoyl carnitine (C14:1)	0.50	0.30	0.24	0.36
B2415	Palmitoylcarnitine (C16)	4.00	3.22	2.82	3.62
B2415	Hydroxypalmitoylcarnitine (C16OH)	0.25	0.24	0.21	0.28
B2415	Stearoylcarnitine (C18)	1.00	1.42	1.19	1.64
B2415	Hydroxystearoylcarnitine (C18OH)	0.25	0.17	0.14	0.20

<b>Lot</b>	<b>Analyte</b>	<b>Enrichment</b>	<b>Mean Value</b>	<b>95% LL</b>	<b>95% UL</b>
C2415	Alanine (Ala)	400.0	445.7	386.1	505.2
C2415	Arginine (Arg)	200.0	130.5	106.0	154.9
C2415	Citrulline (Cit)	100.0	87.1	73.6	100.5
C2415	Glycine (Gly)	600.0	786.8	598.5	975.1
C2415	Leucine (Leu)	300.0	274.2	232.2	316.1
C2415	Methionine (Met)	150.0	113.9	100.4	127.3
C2415	Ornithine (Orn)	200.0	192.9	148.6	237.2
C2415	Phenylalanine (Phe)	300.0	271.2	236.6	305.8
C2415	Creatine (CRE)	200.0	321.5	286.7	356.3
C2415	Guanidinoacetic Acid (GUAC)	10.0	8.2	7.3	9.1
C2415	Creatinine (CRN)	100.0	115.3	97.7	132.9
C2415	Succinylacetone (SUAC)	10.00	4.52	3.32	5.72
C2415	Tyrosine (Tyr)	600.0	476.6	415.8	537.4
C2415	Valine (Val)	350.0	265.5	216.0	315.0
C2415	Free carnitine (C0)	20.00	37.02	30.44	43.60
C2415	Acetylcarnitine (C2)	20.00	22.55	19.66	25.44
C2415	Propionylcarnitine (C3)	8.00	6.81	5.91	7.71
C2415	Malonylcarnitine (C3DC)	1.50	0.92	0.80	1.05
C2415	Butyrylcarnitine (C4)	3.00	2.02	1.74	2.30
C2415	Hydroxybutyrylcarnitine (C4OH)	1.00	0.64	0.56	0.73
C2415	Isovalerylcarnitine (C5)	1.50	1.20	1.04	1.35
C2415	Tiglyl carnitine (C5:1)	1.50	1.03	0.89	1.17
C2415	Glutaryl carnitine (C5DC)	1.00	0.96	0.87	1.06
C2415	Hydroxyisovalerylcarnitine (C5OH)	2.00	1.85	1.62	2.08
C2415	Hexanoylcarnitine (C6)	1.00	0.55	0.48	0.62
C2415	Octanoylcarnitine (C8)	1.00	0.81	0.71	0.92
C2415	Decanoylcarnitine (C10)	1.00	0.84	0.73	0.96
C2415	Dodecanoylcarnitine (C12)	2.00	1.64	1.41	1.88
C2415	Myristoylcarnitine (C14)	1.50	1.17	1.01	1.33
C2415	Tetradecenoyl carnitine (C14:1)	1.50	0.83	0.67	0.98
C2415	Palmitoylcarnitine (C16)	8.00	5.17	4.26	6.08
C2415	Hydroxypalmitoylcarnitine (C16OH)	1.00	0.87	0.72	1.02
C2415	Stearoylcarnitine (C18)	3.00	2.96	2.57	3.34
C2415	Hydroxystearoylcarnitine (C18OH)	1.00	0.65	0.54	0.75
D2415	Alanine (Ala)	600.0	589.7	505.1	674.3
D2415	Arginine (Arg)	300.0	196.8	156.1	237.6
D2415	Citrulline (Cit)	250.0	202.9	164.3	241.5
D2415	Glycine (Gly)	900.0	1052.1	827.7	1276.5
D2415	Leucine (Leu)	600.0	508.3	426.7	590.0

<b>Lot</b>	<b>Analyte</b>	<b>Enrichment</b>	<b>Mean Value</b>	<b>95% LL</b>	<b>95% UL</b>
D2415	Methionine (Met)	250.0	192.4	166.6	218.2
D2415	Ornithine (Orn)	300.0	263.6	200.7	326.6
D2415	Phenylalanine (Phe)	450.0	405.1	346.7	463.4
D2415	Creatine (CRE)	400.0	477.1	401.1	553.0
D2415	Guanidinoacetic Acid (GUAC)	20.0	15.8	13.5	18.2
D2415	Creatinine (CRN)	200.0	207.6	174.4	240.8
D2415	Succinylacetone (SUAC)	20.00	8.28	6.35	10.20
D2415	Tyrosine (Tyr)	900.0	716.3	599.9	832.6
D2415	Valine (Val)	500.0	357.0	289.4	424.6
D2415	Free carnitine (C0)	30.00	49.13	39.64	58.61
D2415	Acetylcarnitine (C2)	30.00	32.19	26.65	37.73
D2415	Propionylcarnitine (C3)	12.00	9.97	8.47	11.48
D2415	Malonylcarnitine (C3DC)	3.00	1.89	1.59	2.19
D2415	Butyrylcarnitine (C4)	5.00	3.52	2.95	4.08
D2415	Hydroxybutyrylcarnitine (C4OH)	2.50	1.53	1.28	1.78
D2415	Isovalerylcarnitine (C5)	3.00	2.40	2.02	2.78
D2415	Tiglyl carnitine (C5:1)	3.00	2.09	1.72	2.46
D2415	Glutaryl carnitine (C5DC)	2.50	2.49	2.14	2.84
D2415	Hydroxyisovalerylcarnitine (C5OH)	3.00	2.65	2.20	3.10
D2415	Hexanoylcarnitine (C6)	2.50	1.47	1.21	1.73
D2415	Octanoylcarnitine (C8)	2.50	2.14	1.75	2.53
D2415	Decanoylcarnitine (C10)	2.50	2.19	1.79	2.60
D2415	Dodecanoylcarnitine (C12)	3.00	2.51	2.01	3.00
D2415	Myristoylcarnitine (C14)	3.00	2.30	1.88	2.73
D2415	Tetradecenoyl carnitine (C14:1)	3.00	1.62	1.32	1.92
D2415	Palmitoylcarnitine (C16)	12.00	7.77	6.40	9.13
D2415	Hydroxypalmitoylcarnitine (C16OH)	1.50	1.31	1.06	1.55
D2415	Stearoylcarnitine (C18)	5.00	4.42	3.72	5.13
D2415	Hydroxystearoylcarnitine (C18OH)	1.50	0.95	0.79	1.11