

Reference Material : Tandem MS 1

Product ID: MSMS1QC-15

Expiration Date: July 2025

Analysis Method: Non-derivatized – MS/MS non-kit

Material Storage: -20°C ± 10°C

Units:µmol/L blood

| Lot | Analyte | Enrichment | Mean Value | 95% LL | 95% UL |
|-------|--|------------|------------|--------|--------|
| A2415 | Alanine (Ala) | 0.00 | 177.3 | 153.9 | 200.8 |
| A2415 | Arginine (Arg) | 0.00 | 4.6 | 3.1 | 6.1 |
| A2415 | Citrulline (Cit) | 0.00 | 12.5 | 9.7 | 15.3 |
| A2415 | Glycine (Gly) | 0.00 | 250.4 | 211.7 | 289.1 |
| A2415 | Leucine (Leu) | 0.00 | 58.7 | 50.2 | 67.2 |
| A2415 | Methionine (Met) | 0.00 | 6.6 | 5.6 | 7.6 |
| A2415 | Ornithine (Orn) | 0.00 | 57.8 | 42.4 | 73.3 |
| A2415 | Phenylalanine (Phe) | 0.00 | 22.3 | 19.0 | 25.5 |
| A2415 | Creatine (CRE) | 0.00 | 191.4 | 167.6 | 215.3 |
| A2415 | Guanidinoacetic Acid (GUAC) | 0.00 | 1.2 | 0.9 | 1.4 |
| A2415 | Creatinine (CRN) | 0.00 | 15.6 | 13.7 | 17.4 |
| A2415 | Succinylacetone (SUAC) | 0.00 | 0.28 | 0.20 | 0.35 |
| A2415 | Tyrosine (Tyr) | 0.00 | 20.8 | 17.9 | 23.6 |
| A2415 | Valine (Val) | 0.00 | 48.1 | 41.5 | 54.6 |
| A2415 | Free carnitine (C0) | 0.00 | 14.65 | 12.81 | 16.49 |
| A2415 | Acetylcarnitine (C2) | 0.00 | 5.32 | 4.73 | 5.91 |
| A2415 | Propionylcarnitine (C3) | 0.00 | 0.89 | 0.80 | 0.97 |
| A2415 | Malonylcarnitine (C3DC) + Hydroxybutyrylcarnitine (C4OH) | 0.00 | 0.05 | 0.04 | 0.06 |
| A2415 | Butyrylcarnitine (C4) | 0.00 | 0.09 | 0.07 | 0.10 |
| A2415 | Isovalerylcarnitine (C5) | 0.00 | 0.06 | 0.04 | 0.07 |
| A2415 | Tiglyl carnitine (C5:1) | 0.00 | 0.01 | 0.00 | 0.03 |
| A2415 | Glutaryl carnitine (C5DC) | 0.00 | 0.04 | 0.03 | 0.05 |
| A2415 | Hydroxyisovalerylcarnitine (C5OH) | 0.00 | 0.55 | 0.47 | 0.62 |
| A2415 | Hexanoylcarnitine (C6) | 0.00 | 0.02 | 0.01 | 0.03 |
| A2415 | Octanoylcarnitine (C8) | 0.00 | 0.03 | 0.01 | 0.06 |
| A2415 | Decanoylcarnitine (C10) | 0.00 | 0.09 | 0.05 | 0.12 |

| | | | | | |
|-------|--|-------|-------|-------|-------|
| A2415 | Dodecanoylcarnitine (C12) | 0.00 | 0.02 | 0.01 | 0.03 |
| A2415 | Myristoylcarnitine (C14) | 0.00 | 0.06 | 0.04 | 0.07 |
| A2415 | Tetradecenoyl carnitine (C14:1) | 0.00 | 0.02 | 0.01 | 0.03 |
| A2415 | Palmitoylcarnitine (C16) | 0.00 | 0.80 | 0.68 | 0.91 |
| A2415 | Hydroxypalmitoylcarnitine (C16OH) | 0.00 | 0.02 | 0.01 | 0.03 |
| A2415 | Stearoylcarnitine (C18) | 0.00 | 0.60 | 0.52 | 0.67 |
| A2415 | Hydroxystearoylcarnitine (C18OH) | 0.00 | 0.01 | 0.01 | 0.01 |
| A2415 | Adenosine (Ado) | 0.00 | 0.22 | 0.16 | 0.29 |
| A2415 | Deoxyadenosine (dAdo) | 0.00 | 0.09 | 0.06 | 0.12 |
| A2415 | C20:0-lysophosphatidylcholine (C20-LPC) | 0.00 | 0.10 | 0.08 | 0.11 |
| A2415 | C22:0-lysophosphatidylcholine (C22-LPC) | 0.00 | 0.02 | 0.01 | 0.03 |
| A2415 | C24:0-lysophosphatidylcholine (C24-LPC) | 0.00 | 0.05 | 0.03 | 0.06 |
| A2415 | C26:0-lysophosphatidylcholine (C26-LPC) | 0.00 | 0.02 | 0.01 | 0.03 |
| B2415 | Alanine (Ala) | 200.0 | 337.5 | 292.8 | 382.1 |
| B2415 | Arginine (Arg) | 100.0 | 61.7 | 47.3 | 76.1 |
| B2415 | Citrulline (Cit) | 25.0 | 31.5 | 25.4 | 37.5 |
| B2415 | Glycine (Gly) | 300.0 | 465.0 | 402.3 | 527.6 |
| B2415 | Leucine (Leu) | 150.0 | 176.2 | 157.6 | 194.8 |
| B2415 | Methionine (Met) | 50.0 | 38.4 | 34.4 | 42.4 |
| B2415 | Ornithine (Orn) | 100.0 | 127.1 | 89.6 | 164.6 |
| B2415 | Phenylalanine (Phe) | 150.0 | 137.5 | 122.6 | 152.4 |
| B2415 | Creatine (CRE) | 50.0 | 225.8 | 198.0 | 253.7 |
| B2415 | Guanidinoacetic Acid (GUAC) | 5.0 | 4.8 | 4.0 | 5.5 |
| B2415 | Creatinine (CRN) | 50.0 | 56.3 | 49.6 | 62.9 |
| B2415 | Succinylacetone (SUAC) | 2.50 | 1.13 | 0.94 | 1.33 |
| B2415 | Tyrosine (Tyr) | 300.0 | 234.1 | 207.3 | 260.9 |
| B2415 | Valine (Val) | 200.0 | 189.2 | 170.5 | 207.8 |
| B2415 | Free carnitine (C0) | 10.00 | 22.18 | 19.59 | 24.78 |
| B2415 | Acetylcarnitine (C2) | 10.00 | 14.13 | 12.61 | 15.64 |
| B2415 | Propionylcarnitine (C3) | 4.00 | 3.88 | 3.49 | 4.27 |
| B2415 | Malonylcarnitine (C3DC) + Hydroxybutyrylcarnitine (C4OH) | 1.00 | 0.29 | 0.26 | 0.32 |
| B2415 | Butyrylcarnitine (C4) | 1.00 | 0.74 | 0.65 | 0.83 |
| B2415 | Isovalerylcarnitine (C5) | 0.50 | 0.44 | 0.39 | 0.48 |
| B2415 | Tiglyl carnitine (C5:1) | 0.50 | 0.33 | 0.29 | 0.37 |
| B2415 | Glutaryl carnitine (C5DC) | 0.50 | 0.52 | 0.45 | 0.60 |
| B2415 | Hydroxyisovalerylcarnitine (C5OH) | 1.00 | 1.28 | 1.12 | 1.44 |
| B2415 | Hexanoylcarnitine (C6) | 0.50 | 0.34 | 0.30 | 0.37 |
| B2415 | Octanoylcarnitine (C8) | 0.50 | 0.42 | 0.37 | 0.46 |
| B2415 | Decanoylcarnitine (C10) | 0.50 | 0.53 | 0.46 | 0.61 |
| B2415 | Dodecanoylcarnitine (C12) | 1.00 | 0.71 | 0.63 | 0.80 |

| | | | | | |
|-------|--|-------|-------|-------|-------|
| B2415 | Myristoylcarnitine (C14) | 0.50 | 0.39 | 0.35 | 0.44 |
| B2415 | Tetradecenoyl carnitine (C14:1) | 0.50 | 0.25 | 0.22 | 0.28 |
| B2415 | Palmitoylcarnitine (C16) | 4.00 | 3.11 | 2.70 | 3.52 |
| B2415 | Hydroxypalmitoylcarnitine (C16OH) | 0.25 | 0.23 | 0.20 | 0.26 |
| B2415 | Stearoylcarnitine (C18) | 1.00 | 1.35 | 1.14 | 1.56 |
| B2415 | Hydroxystearoylcarnitine (C18OH) | 0.25 | 0.15 | 0.13 | 0.18 |
| B2415 | Adenosine (Ado) | 1.00 | 1.27 | 1.07 | 1.48 |
| B2415 | Deoxyadenosine (dAdo) | 0.50 | 0.54 | 0.45 | 0.63 |
| B2415 | C20:0-lysophosphatidylcholine (C20-LPC) | 0.25 | 0.29 | 0.23 | 0.34 |
| B2415 | C22:0-lysophosphatidylcholine (C22-LPC) | 0.25 | 0.23 | 0.18 | 0.27 |
| B2415 | C24:0-lysophosphatidylcholine (C24-LPC) | 0.25 | 0.29 | 0.25 | 0.34 |
| B2415 | C26:0-lysophosphatidylcholine (C26-LPC) | 0.25 | 0.30 | 0.24 | 0.36 |
| C2415 | Alanine (Ala) | 400.0 | 478.6 | 409.4 | 547.7 |
| C2415 | Arginine (Arg) | 200.0 | 120.0 | 94.6 | 145.4 |
| C2415 | Citrulline (Cit) | 100.0 | 86.4 | 71.9 | 100.8 |
| C2415 | Glycine (Gly) | 600.0 | 682.0 | 568.9 | 795.1 |
| C2415 | Leucine (Leu) | 300.0 | 285.2 | 244.6 | 325.9 |
| C2415 | Methionine (Met) | 150.0 | 97.9 | 85.3 | 110.6 |
| C2415 | Ornithine (Orn) | 200.0 | 184.8 | 139.1 | 230.4 |
| C2415 | Phenylalanine (Phe) | 300.0 | 252.4 | 218.6 | 286.1 |
| C2415 | Creatine (CRE) | 200.0 | 338.4 | 290.2 | 386.5 |
| C2415 | Guanidinoacetic Acid (GUAC) | 10.0 | 8.4 | 6.9 | 9.9 |
| C2415 | Creatinine (CRN) | 100.0 | 99.2 | 84.0 | 114.4 |
| C2415 | Succinylacetone (SUAC) | 10.00 | 3.87 | 2.87 | 4.87 |
| C2415 | Tyrosine (Tyr) | 600.0 | 440.6 | 382.1 | 499.0 |
| C2415 | Valine (Val) | 350.0 | 296.8 | 253.1 | 340.5 |
| C2415 | Free carnitine (C0) | 20.00 | 30.32 | 26.23 | 34.42 |
| C2415 | Acetylcarnitine (C2) | 20.00 | 21.91 | 19.02 | 24.79 |
| C2415 | Propionylcarnitine (C3) | 8.00 | 6.87 | 5.89 | 7.85 |
| C2415 | Malonylcarnitine (C3DC) + Hydroxybutyrylcarnitine (C4OH) | 2.50 | 0.56 | 0.48 | 0.63 |
| C2415 | Butyrylcarnitine (C4) | 3.00 | 2.02 | 1.74 | 2.29 |
| C2415 | Isovalerylcarnitine (C5) | 1.50 | 1.20 | 1.03 | 1.37 |
| C2415 | Tiglyl carnitine (C5:1) | 1.50 | 0.94 | 0.81 | 1.07 |
| C2415 | Glutaryl carnitine (C5DC) | 1.00 | 0.99 | 0.87 | 1.11 |
| C2415 | Hydroxyisovalerylcarnitine (C5OH) | 2.00 | 2.05 | 1.79 | 2.32 |
| C2415 | Hexanoylcarnitine (C6) | 1.00 | 0.64 | 0.53 | 0.74 |
| C2415 | Octanoylcarnitine (C8) | 1.00 | 0.82 | 0.70 | 0.95 |
| C2415 | Decanoylcarnitine (C10) | 1.00 | 1.05 | 0.87 | 1.24 |
| C2415 | Dodecanoylcarnitine (C12) | 2.00 | 1.58 | 1.32 | 1.85 |
| C2415 | Myristoylcarnitine (C14) | 1.50 | 1.19 | 0.99 | 1.39 |

| | | | | | |
|-------|--|-------|-------|-------|--------|
| C2415 | Tetradecenoyl carnitine (C14:1) | 1.50 | 0.72 | 0.60 | 0.84 |
| C2415 | Palmitoylcarnitine (C16) | 8.00 | 5.11 | 4.30 | 5.92 |
| C2415 | Hydroxypalmitoylcarnitine (C16OH) | 1.00 | 0.86 | 0.73 | 1.00 |
| C2415 | Stearoylcarnitine (C18) | 3.00 | 2.92 | 2.46 | 3.37 |
| C2415 | Hydroxystearoylcarnitine (C18OH) | 1.00 | 0.60 | 0.51 | 0.69 |
| C2415 | Adenosine (Ado) | 5.00 | 5.77 | 5.08 | 6.46 |
| C2415 | Deoxyadenosine (dAdo) | 2.50 | 2.33 | 2.03 | 2.64 |
| C2415 | C20:0-lysophosphatidylcholine (C20-LPC) | 0.50 | 0.47 | 0.30 | 0.63 |
| C2415 | C22:0-lysophosphatidylcholine (C22-LPC) | 0.50 | 0.43 | 0.37 | 0.49 |
| C2415 | C24:0-lysophosphatidylcholine (C24-LPC) | 0.50 | 0.53 | 0.45 | 0.62 |
| C2415 | C26:0-lysophosphatidylcholine (C26-LPC) | 0.50 | 0.56 | 0.47 | 0.65 |
| D2415 | Alanine (Ala) | 600.0 | 640.1 | 556.2 | 724.1 |
| D2415 | Arginine (Arg) | 300.0 | 181.5 | 148.7 | 214.4 |
| D2415 | Citrulline (Cit) | 250.0 | 200.3 | 169.1 | 231.5 |
| D2415 | Glycine (Gly) | 900.0 | 910.8 | 756.5 | 1065.1 |
| D2415 | Leucine (Leu) | 600.0 | 534.2 | 466.3 | 602.0 |
| D2415 | Methionine (Met) | 250.0 | 171.5 | 151.3 | 191.7 |
| D2415 | Ornithine (Orn) | 300.0 | 253.0 | 198.3 | 307.8 |
| D2415 | Phenylalanine (Phe) | 450.0 | 381.9 | 335.6 | 428.3 |
| D2415 | Creatine (CRE) | 400.0 | 505.1 | 433.0 | 577.1 |
| D2415 | Guanidinoacetic Acid (GUAC) | 20.0 | 16.1 | 13.5 | 18.7 |
| D2415 | Creatinine (CRN) | 200.0 | 190.4 | 159.5 | 221.3 |
| D2415 | Succinylacetone (SUAC) | 20.00 | 7.45 | 5.94 | 8.95 |
| D2415 | Tyrosine (Tyr) | 900.0 | 670.8 | 583.2 | 758.4 |
| D2415 | Valine (Val) | 500.0 | 417.9 | 350.7 | 485.2 |
| D2415 | Free carnitine (C0) | 30.00 | 39.45 | 33.83 | 45.08 |
| D2415 | Acetylcarnitine (C2) | 30.00 | 31.91 | 27.51 | 36.31 |
| D2415 | Propionylcarnitine (C3) | 12.00 | 10.25 | 8.90 | 11.60 |
| D2415 | Malonylcarnitine (C3DC) + Hydroxybutyrylcarnitine (C4OH) | 5.50 | 1.32 | 1.13 | 1.52 |
| D2415 | Butyrylcarnitine (C4) | 5.00 | 3.61 | 3.03 | 4.18 |
| D2415 | Isovalerylcarnitine (C5) | 3.00 | 2.45 | 2.11 | 2.79 |
| D2415 | Tiglyl carnitine (C5:1) | 3.00 | 1.95 | 1.64 | 2.26 |
| D2415 | Glutaryl carnitine (C5DC) | 2.50 | 2.53 | 2.17 | 2.88 |
| D2415 | Hydroxyisovalerylcarnitine (C5OH) | 3.00 | 2.91 | 2.45 | 3.36 |
| D2415 | Hexanoylcarnitine (C6) | 2.50 | 1.70 | 1.45 | 1.94 |
| D2415 | Octanoylcarnitine (C8) | 2.50 | 2.14 | 1.84 | 2.44 |
| D2415 | Decanoylcarnitine (C10) | 2.50 | 2.59 | 2.09 | 3.09 |
| D2415 | Dodecanoylcarnitine (C12) | 3.00 | 2.43 | 2.03 | 2.83 |
| D2415 | Myristoylcarnitine (C14) | 3.00 | 2.36 | 2.01 | 2.71 |
| D2415 | Tetradecenoyl carnitine (C14:1) | 3.00 | 1.43 | 1.19 | 1.68 |

| | | | | | |
|-------|---|-------|-------|------|-------|
| D2415 | Palmitoylcarnitine (C16) | 12.00 | 7.91 | 6.75 | 9.08 |
| D2415 | Hydroxypalmitoylcarnitine (C16OH) | 1.50 | 1.31 | 1.13 | 1.49 |
| D2415 | Stearoylcarnitine (C18) | 5.00 | 4.53 | 3.85 | 5.21 |
| D2415 | Hydroxystearoylcarnitine (C18OH) | 1.50 | 0.88 | 0.75 | 1.01 |
| D2415 | Adenosine (Ado) | 10.00 | 10.75 | 9.31 | 12.19 |
| D2415 | Deoxyadenosine (dAdo) | 5.00 | 4.44 | 3.82 | 5.06 |
| D2415 | C20:0-lysophosphatidylcholine (C20-LPC) | 2.00 | 1.65 | 1.25 | 2.06 |
| D2415 | C22:0-lysophosphatidylcholine (C22-LPC) | 2.00 | 1.67 | 1.44 | 1.91 |
| D2415 | C24:0-lysophosphatidylcholine (C24-LPC) | 2.00 | 1.95 | 1.64 | 2.27 |
| D2415 | C26:0-lysophosphatidylcholine (C26-LPC) | 2.00 | 2.06 | 1.82 | 2.30 |
