

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|-------------|---|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Serum | 11-Desoxycortisol | 21.3 | 31.5 | 16.0 | 14.3 | 40.6 | 45.6 | 10.7 | 9.5 | 27.1 | 30.4 | 5.3 | 4.8 | 13.5 | 15.2 |
| Serum | 17-Hydroxyprogesterone | 19.6 | 50.4 | 14.7 | 20.3 | 44.5 | 49.1 | 9.8 | 13.5 | 29.7 | 32.7 | 4.9 | 6.8 | 14.8 | 16.4 |
| Urine | 4-hydroxy-3-methoximandelate (VMA) | 22.2 | 47 | 16.7 | 19.5 | 47.0 | 52.1 | 11.1 | 13.0 | 31.3 | 34.8 | 5.6 | 6.5 | 15.7 | 17.4 |
| Serum | 5' Nucleotidase | 23.2 | 19.9 | 17.4 | 11.5 | 40.2 | 45.6 | 11.6 | 7.6 | 26.8 | 30.4 | 5.8 | 3.8 | 13.4 | 15.2 |
| Urine | 5'-Hydroxyindolacetate, concentration | 20.3 | 33.2 | 15.2 | 14.6 | 39.7 | 44.4 | 10.2 | 9.7 | 26.5 | 29.6 | 5.1 | 4.9 | 13.2 | 14.8 |
| Serum | Alpha 1-Acid Glycoprotein | 11.3 | 24.9 | 8.5 | 10.3 | 24.2 | 26.9 | 5.7 | 6.8 | 16.2 | 17.9 | 2.8 | 3.4 | 8.1 | 9.0 |
| Serum | Alpha 1-Antichymotrypsin | 13.5 | 18.3 | 10.1 | 8.5 | 25.2 | 28.4 | 6.8 | 5.7 | 16.8 | 18.9 | 3.4 | 2.8 | 8.4 | 9.5 |
| Serum | Alpha 1-Antitrypsin | 5.9 | 16.3 | 4.4 | 6.5 | 13.8 | 15.2 | 3.0 | 4.3 | 9.2 | 10.1 | 1.5 | 2.2 | 4.6 | 5.1 |
| Serum | Alpha 1-Globulins | 11.4 | 22.6 | 8.6 | 9.5 | 23.6 | 26.3 | 5.7 | 6.3 | 15.7 | 17.5 | 2.9 | 3.2 | 7.9 | 8.8 |
| Urine | Alpha 1-Microglobulin, concentration, first morning | 33 | 58 | 24.8 | 25.0 | 65.9 | 73.5 | 16.5 | 16.7 | 43.9 | 49.0 | 8.3 | 8.3 | 22.0 | 24.5 |
| Plasma | Alpha 2-Antiplasmin | 6.2 | --- | 4.7 | | 7.7 | 9.1 | 3.1 | | 5.1 | 6.1 | 1.6 | | 2.6 | 3.0 |
| Serum | Alpha 2-Globulins | 10.3 | 12.7 | 7.7 | 6.1 | 18.9 | 21.3 | 5.2 | 4.1 | 12.6 | 14.2 | 2.6 | 2.0 | 6.3 | 7.1 |
| Serum | Alpha 2-Macroglobulin | 3.4 | 18.7 | 2.6 | 7.1 | 11.3 | 12.1 | 1.7 | 4.8 | 7.6 | 8.1 | 0.9 | 2.4 | 3.8 | 4.0 |
| Urine | Alpha 2-Microglobulin output, first morning | 29 | 32 | 21.8 | 16.2 | 52.1 | 58.8 | 14.5 | 10.8 | 34.7 | 39.2 | 7.3 | 5.4 | 17.4 | 19.6 |
| Plasma | Alpha-aminobutyric acid | 24.7 | 32.3 | 18.5 | 15.2 | 45.8 | 51.6 | 12.4 | 10.2 | 30.5 | 34.4 | 6.2 | 5.1 | 15.3 | 17.2 |
| Serum | Alpha-Amylase | 8.7 | 28.3 | 6.5 | 11.1 | 21.9 | 23.9 | 4.4 | 7.4 | 14.6 | 15.9 | 2.2 | 3.7 | 7.3 | 8.0 |
| Serum | Alpha-Amylase (pancreatic) | 11.7 | 29.9 | 8.8 | 12.0 | 26.5 | 29.2 | 5.9 | 8.0 | 17.7 | 19.5 | 2.9 | 4.0 | 8.8 | 9.7 |
| Urine | Alpha-Amylase (pancreatic) | 69.5 | 105 | 52.1 | 47.2 | 133.2 | 149.4 | 34.8 | 31.5 | 88.8 | 99.6 | 17.4 | 15.7 | 44.4 | 49.8 |
| Urine | Alpha-Amylase concentration, random | 94 | 46 | 70.5 | 39.2 | 155.6 | 177.4 | 47.0 | 26.2 | 103.7 | 118.3 | 23.5 | 13.1 | 51.9 | 59.1 |
| Plasma | Alpha-Carotene | 24 | 65 | 18.0 | 26.0 | 55.7 | 61.3 | 12.0 | 17.3 | 37.1 | 40.8 | 6.0 | 8.7 | 18.6 | 20.4 |
| Serum | Alpha-Carotene | 48 | 65 | 36.0 | 30.3 | 89.7 | 100.9 | 24.0 | 20.2 | 59.8 | 67.2 | 12.0 | 10.1 | 29.9 | 33.6 |
| Serum | Alpha-Fetoprotein(non hepatic carcinoma) | 12.2 | 45.6 | 9.2 | 17.7 | 32.8 | 35.6 | 6.1 | 11.8 | 21.9 | 23.8 | 3.1 | 5.9 | 10.9 | 11.9 |
| Serum | Alpha-Tocopherol | 13.8 | 15 | 10.4 | 7.6 | 24.7 | 27.9 | 6.9 | 5.1 | 16.5 | 18.6 | 3.5 | 2.5 | 8.2 | 9.3 |
| Serum | Acid phosphatase | 8.9 | 8 | 6.7 | 4.5 | 15.5 | 17.6 | 4.5 | 3.0 | 10.3 | 11.7 | 2.2 | 1.5 | 5.2 | 5.9 |
| Serum | Acid phosphatase tartrate-resistant (TR-ACP) | 8 | 13.3 | 6.0 | 5.8 | 15.7 | 17.6 | 4.0 | 3.9 | 10.5 | 11.7 | 2.0 | 1.9 | 5.2 | 5.9 |
| Serum | Acid phosphatase prostatic activity (PAP) | 33.8 | --- | 25.4 | | 41.8 | 49.7 | 16.9 | | 27.9 | 33.1 | 8.5 | | 13.9 | 16.6 |

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| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Plasma | Activated partial thromboplastine time | 2.7 | 8.6 | 2.0 | 3.4 | 6.7 | 7.3 | 1.4 | 2.3 | 4.5 | 4.9 | 0.7 | 1.1 | 2.2 | 2.4 |
| Plasma | Adiponectin | 18.8 | 51.2 | 14.1 | 20.5 | 43.7 | 48.1 | 9.4 | 13.6 | 29.1 | 32.1 | 4.7 | 6.8 | 14.6 | 16.0 |
| Serum | Adenosine deaminase (ADA) | 11.7 | 25.5 | 8.8 | 10.5 | 25.0 | 27.7 | 5.9 | 7.0 | 16.7 | 18.5 | 2.9 | 3.5 | 8.3 | 9.2 |
| Plasma | Alanine | 14.7 | 55.8 | 11.0 | 21.6 | 39.8 | 43.2 | 7.4 | 14.4 | 26.6 | 28.8 | 3.7 | 7.2 | 13.3 | 14.4 |
| Serum | Alanine aminopeptidase | 4.1 | --- | 3.1 | | 5.1 | 6.0 | 2.1 | | 3.4 | 4.0 | 1.0 | | 1.7 | 2.0 |
| Serum | Alanine aminotransferase (ALT) | 19.4 | 41.6 | 14.6 | 17.2 | 41.2 | 45.7 | 9.7 | 11.5 | 27.5 | 30.5 | 4.9 | 5.7 | 13.7 | 15.2 |
| Serum | Albumin | 3.2 | 4.75 | 2.4 | 2.1 | 6.1 | 6.9 | 1.6 | 1.4 | 4.1 | 4.6 | 0.8 | 0.7 | 2.0 | 2.3 |
| Urine | Albumin, concentration, first morning | 36 | 55 | 27.0 | 24.7 | 69.2 | 77.6 | 18.0 | 16.4 | 46.1 | 51.7 | 9.0 | 8.2 | 23.1 | 25.9 |
| Urine | Albumin, output, night urine | 29.5 | 58 | 22.1 | 24.4 | 60.9 | 67.8 | 14.8 | 16.3 | 40.6 | 45.2 | 7.4 | 8.1 | 20.3 | 22.6 |
| Serum | Albumin, glycated | 5.2 | 10.3 | 3.9 | 4.3 | 10.8 | 12.0 | 2.6 | 2.9 | 7.2 | 8.0 | 1.3 | 1.4 | 3.6 | 4.0 |
| Serum | Aldosterone | 29.4 | 40.1 | 22.1 | 18.6 | 55.0 | 61.9 | 14.7 | 12.4 | 36.7 | 41.2 | 7.4 | 6.2 | 18.3 | 20.6 |
| Urine | Aldosterone | 39.4 | 40.1 | 29.6 | 21.1 | 69.8 | 79.0 | 19.7 | 14.1 | 46.6 | 52.7 | 9.9 | 7.0 | 23.3 | 26.3 |
| Serum | Alkaline phosphatase | 6.45 | 26.1 | 4.8 | 10.1 | 18.1 | 19.6 | 3.2 | 6.7 | 12.0 | 13.0 | 1.6 | 3.4 | 6.0 | 6.5 |
| Serum | Alkaline phosphatase, bone | 6.2 | 37.4 | 4.7 | 14.2 | 21.9 | 23.3 | 3.1 | 9.5 | 14.6 | 15.6 | 1.6 | 4.7 | 7.3 | 7.8 |
| Serum | Alkaline phosphatase, liver | 10 | 27 | 7.5 | 10.8 | 23.2 | 25.5 | 5.0 | 7.2 | 15.4 | 17.0 | 2.5 | 3.6 | 7.7 | 8.5 |
| Serum | Alkaline phosphatase, placental | 19.1 | --- | 14.3 | | 23.6 | 28.1 | 9.6 | | 15.8 | 18.7 | 4.8 | | 7.9 | 9.4 |
| Urine | Ammonia, output, 24h | 24.7 | 27.3 | 18.5 | 13.8 | 44.4 | 50.1 | 12.4 | 9.2 | 29.6 | 33.4 | 6.2 | 4.6 | 14.8 | 16.7 |
| Serum | Amyloid A | 25 | 61 | 18.8 | 24.7 | 55.7 | 61.5 | 12.5 | 16.5 | 37.1 | 41.0 | 6.3 | 8.2 | 18.6 | 20.5 |
| Serum | Androstendione | 15.8 | 38.8 | 11.9 | 15.7 | 35.3 | 38.9 | 7.9 | 10.5 | 23.5 | 26.0 | 4.0 | 5.2 | 11.8 | 13.0 |
| Serum | Anion gap | 9.5 | 10.1 | 7.1 | 5.2 | 17.0 | 19.2 | 4.8 | 3.5 | 11.3 | 12.8 | 2.4 | 1.7 | 5.7 | 6.4 |
| Plasma | Antithrombin III | 5.2 | 15.3 | 3.9 | 6.1 | 12.5 | 13.7 | 2.6 | 4.0 | 8.3 | 9.1 | 1.3 | 2.0 | 4.2 | 4.6 |
| Serum | Apolipoprotein A1 | 6.5 | 13.4 | 4.9 | 5.6 | 13.6 | 15.1 | 3.3 | 3.7 | 9.1 | 10.1 | 1.6 | 1.9 | 4.5 | 5.0 |
| Serum | Apolipoprotein B | 6.9 | 22.8 | 5.2 | 8.9 | 17.5 | 19.1 | 3.5 | 6.0 | 11.6 | 12.7 | 1.7 | 3.0 | 5.8 | 6.4 |
| Plasma | Arginine | 19.3 | 34.1 | 14.5 | 14.7 | 38.6 | 43.1 | 9.7 | 9.8 | 25.7 | 28.7 | 4.8 | 4.9 | 12.9 | 14.4 |
| Serum | Arilestearase activity, non inhibited | 3.8 | 37.2 | 2.9 | 14.0 | 18.7 | 19.6 | 1.9 | 9.3 | 12.5 | 13.1 | 1.0 | 4.7 | 6.2 | 6.5 |
| Plasma | Ascorbate (Vitamin C) | 20 | 21 | 15.0 | 10.9 | 35.6 | 40.3 | 10.0 | 7.3 | 23.8 | 26.9 | 5.0 | 3.6 | 11.9 | 13.4 |
| Serum | Ascorbate (Vitamin C) | 26 | 31 | 19.5 | 15.2 | 47.3 | 53.4 | 13.0 | 10.1 | 31.6 | 35.6 | 6.5 | 5.1 | 15.8 | 17.8 |
| Plasma | Asparagine | 12.3 | 28 | 9.2 | 11.5 | 26.7 | 29.5 | 6.2 | 7.6 | 17.8 | 19.7 | 3.1 | 3.8 | 8.9 | 9.8 |
| Serum | Aspartate aminotransferase (AST) | 12.3 | 23.1 | 9.2 | 9.8 | 25.0 | 27.9 | 6.2 | 6.5 | 16.7 | 18.6 | 3.1 | 3.3 | 8.3 | 9.3 |
| Plasma | Aspartic acid | 31.2 | 55.1 | 23.4 | 23.7 | 62.4 | 69.6 | 15.6 | 15.8 | 41.6 | 46.4 | 7.8 | 7.9 | 20.8 | 23.2 |

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| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Serum | Beta-2-Microglobulin | 5.9 | 15.5 | 4.4 | 6.2 | 13.5 | 14.9 | 3.0 | 4.1 | 9.0 | 9.9 | 1.5 | 2.1 | 4.5 | 5.0 |
| Plasma | Beta-Carotene | 18 | 48 | 13.5 | 19.2 | 41.5 | 45.7 | 9.0 | 12.8 | 27.7 | 30.5 | 4.5 | 6.4 | 13.8 | 15.2 |
| Serum | Beta-Carotene | 36 | 39.7 | 27.0 | 20.1 | 64.6 | 73.0 | 18.0 | 13.4 | 43.1 | 48.7 | 9.0 | 6.7 | 21.5 | 24.3 |
| Serum | Beta-Cryptoxantin | 36.7 | --- | 27.5 | | 45.4 | 53.9 | 18.4 | | 30.3 | 36.0 | 9.2 | | 15.1 | 18.0 |
| Serum | Beta-Globulins | 10.1 | 9.1 | 7.6 | 5.1 | 17.6 | 19.9 | 5.1 | 3.4 | 11.7 | 13.3 | 2.5 | 1.7 | 5.9 | 6.6 |
| Blood | Base excess | 76.4 | 43.2 | 57.3 | 32.9 | 127.5 | 145.2 | 38.2 | 21.9 | 85.0 | 96.8 | 19.1 | 11.0 | 42.5 | 48.4 |
| Blood | Basophile, count | 28 | 54.8 | 21.0 | 23.1 | 57.7 | 64.2 | 14.0 | 15.4 | 38.5 | 42.8 | 7.0 | 7.7 | 19.2 | 21.4 |
| Serum | Bilirubin total | 21.8 | 28.4 | 16.4 | 13.4 | 40.4 | 45.5 | 10.9 | 9.0 | 26.9 | 30.3 | 5.5 | 4.5 | 13.5 | 15.2 |
| Serum | Bilirubin conjugated | 36.8 | 43.2 | 27.6 | 21.3 | 66.8 | 75.4 | 18.4 | 14.2 | 44.5 | 50.3 | 9.2 | 7.1 | 22.3 | 25.1 |
| Plasma | C Protein | 5.6 | 55.2 | 4.2 | 20.8 | 27.7 | 29.0 | 2.8 | 13.9 | 18.5 | 19.4 | 1.4 | 6.9 | 9.2 | 9.7 |
| Serum | C reactive protein | 42.2 | 76.3 | 31.7 | 32.7 | 84.9 | 94.7 | 21.1 | 21.8 | 56.6 | 63.2 | 10.6 | 10.9 | 28.3 | 31.6 |
| Serum | C reactive protein - high sensitivity | 49.7 | 89.23 | 37.3 | 38.3 | 99.8 | 111.4 | 24.9 | 25.5 | 66.5 | 74.2 | 12.4 | 12.8 | 33.3 | 37.1 |
| Serum | C3 Complement | 5.2 | 15.6 | 3.9 | 6.2 | 12.6 | 13.8 | 2.6 | 4.1 | 8.4 | 9.2 | 1.3 | 2.1 | 4.2 | 4.6 |
| Serum | C4 Complement | 8.9 | 33.4 | 6.7 | 13.0 | 24.0 | 26.0 | 4.5 | 8.6 | 16.0 | 17.4 | 2.2 | 4.3 | 8.0 | 8.7 |
| Serum | CA 125 antigen | 24.7 | 54.6 | 18.5 | 22.5 | 53.0 | 58.8 | 12.4 | 15.0 | 35.4 | 39.2 | 6.2 | 7.5 | 17.7 | 19.6 |
| Serum | CA 15.3 antigen | 6.1 | 62.9 | 4.6 | 23.7 | 31.2 | 32.7 | 3.1 | 15.8 | 20.8 | 21.8 | 1.5 | 7.9 | 10.4 | 10.9 |
| Serum | CA 19.9 antigen | 16 | 130.5 | 12.0 | 49.3 | 69.1 | 72.8 | 8.0 | 32.9 | 46.1 | 48.5 | 4.0 | 16.4 | 23.0 | 24.3 |
| Serum | CA 549 antigen | 9.1 | 33.4 | 6.8 | 13.0 | 24.2 | 26.4 | 4.6 | 8.7 | 16.2 | 17.6 | 2.3 | 4.3 | 8.1 | 8.8 |
| Serum | Calcium | 2.1 | 2.5 | 1.6 | 1.2 | 3.8 | 4.3 | 1.1 | 0.8 | 2.5 | 2.9 | 0.5 | 0.4 | 1.3 | 1.4 |
| Serum | Calcium, complexed | 5.3 | 4.5 | 4.0 | 2.6 | 9.2 | 10.4 | 2.7 | 1.7 | 6.1 | 6.9 | 1.3 | 0.9 | 3.1 | 3.5 |
| Urine | Calcium, concentration, 24h | 27.5 | 36.6 | 20.6 | 17.2 | 51.2 | 57.6 | 13.8 | 11.4 | 34.1 | 38.4 | 6.9 | 5.7 | 17.1 | 19.2 |
| Serum | Calcium, ionized | 1.7 | 1.9 | 1.3 | 1.0 | 3.1 | 3.5 | 0.9 | 0.6 | 2.0 | 2.3 | 0.4 | 0.3 | 1.0 | 1.2 |
| Serum | Calcium, protein bound | 4.1 | 6.1 | 3.1 | 2.8 | 7.8 | 8.8 | 2.1 | 1.8 | 5.2 | 5.9 | 1.0 | 0.9 | 2.6 | 2.9 |
| Serum | Calcium, ultrafiltrable | 2.2 | 2.7 | 1.7 | 1.3 | 4.0 | 4.5 | 1.1 | 0.9 | 2.7 | 3.0 | 0.6 | 0.4 | 1.3 | 1.5 |
| Serum | Carbohydrate deficient transferrin | 7.1 | 38.7 | 5.3 | 14.8 | 23.5 | 25.2 | 3.6 | 9.8 | 15.7 | 16.8 | 1.8 | 4.9 | 7.8 | 8.4 |
| Blood | CO ₂ , total | 4 | 4.8 | 3.0 | 2.3 | 7.3 | 8.2 | 2.0 | 1.6 | 4.9 | 5.5 | 1.0 | 0.8 | 2.4 | 2.7 |
| Serum | Carcinoembryonic antigen (CEA) | 12.7 | 55.6 | 9.5 | 21.4 | 37.1 | 40.1 | 6.4 | 14.3 | 24.7 | 26.7 | 3.2 | 7.1 | 12.4 | 13.4 |
| Serum | Carnitine, Acyl-free | 11.35 | 24.3 | 8.5 | 10.1 | 24.1 | 26.7 | 5.7 | 6.7 | 16.1 | 17.8 | 2.8 | 3.4 | 8.0 | 8.9 |
| Serum | Carnitine, free | 8.05 | 16.65 | 6.0 | 6.9 | 16.9 | 18.8 | 4.0 | 4.6 | 11.3 | 12.5 | 2.0 | 2.3 | 5.6 | 6.3 |
| Serum | Carnitine, total | 8.85 | 11.8 | 6.6 | 5.5 | 16.5 | 18.5 | 4.4 | 3.7 | 11.0 | 12.4 | 2.2 | 1.8 | 5.5 | 6.2 |

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| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Serum | Ceruloplasmin (ferroxidase) | 5.8 | 11.1 | 4.4 | 4.7 | 11.9 | 13.2 | 2.9 | 3.1 | 7.9 | 8.8 | 1.5 | 1.6 | 4.0 | 4.4 |
| Serum | Chloride | 1.2 | 1.5 | 0.9 | 0.7 | 2.2 | 2.5 | 0.6 | 0.5 | 1.5 | 1.7 | 0.3 | 0.2 | 0.7 | 0.8 |
| Serum | Cholesterol | 5.95 | 15.3 | 4.5 | 6.2 | 13.5 | 14.9 | 3.0 | 4.1 | 9.0 | 9.9 | 1.5 | 2.1 | 4.5 | 5.0 |
| Serum | Cholinesterase, concentration | 7.1 | --- | 5.3 | | 8.8 | 10.4 | 3.6 | | 5.9 | 7.0 | 1.8 | | 2.9 | 3.5 |
| Serum | Cholinesterase, activity | 6.1 | 18.2 | 4.6 | 7.2 | 14.7 | 16.2 | 3.1 | 4.8 | 9.8 | 10.8 | 1.5 | 2.4 | 4.9 | 5.4 |
| Plasma | Chromogranin A | 12.8 | 26.3 | 9.6 | 11.0 | 26.8 | 29.8 | 6.4 | 7.3 | 17.9 | 19.9 | 3.2 | 3.7 | 8.9 | 9.9 |
| Plasma | Citrulline | 21.4 | 43.9 | 16.1 | 18.3 | 44.8 | 49.8 | 10.7 | 12.2 | 29.9 | 33.2 | 5.4 | 6.1 | 14.9 | 16.6 |
| Serum | Collagen type I C propeptide (PICP) | 7.8 | 26.7 | 5.9 | 10.4 | 20.1 | 21.9 | 3.9 | 7.0 | 13.4 | 14.6 | 2.0 | 3.5 | 6.7 | 7.3 |
| Serum | Collagen type I N propeptide (PINP) | 7.4 | 57.3 | 5.6 | 21.7 | 30.8 | 32.5 | 3.7 | 14.4 | 20.5 | 21.7 | 1.9 | 7.2 | 10.3 | 10.8 |
| Serum | Collagen type III N propeptide (PIIINP) | 13.6 | 87.2 | 10.2 | 33.1 | 49.9 | 53.1 | 6.8 | 22.1 | 33.3 | 35.4 | 3.4 | 11.0 | 16.6 | 17.7 |
| Urine | Color, first morning | 30.9 | 47.4 | 23.2 | 21.2 | 59.5 | 66.6 | 15.5 | 14.1 | 39.6 | 44.4 | 7.7 | 7.1 | 19.8 | 22.2 |
| Plasma | Copper | 8 | 19 | 6.0 | 7.7 | 17.6 | 19.5 | 4.0 | 5.2 | 11.8 | 13.0 | 2.0 | 2.6 | 5.9 | 6.5 |
| Serum | Copper | 4.7 | 13.6 | 3.5 | 5.4 | 11.2 | 12.3 | 2.4 | 3.6 | 7.5 | 8.2 | 1.2 | 1.8 | 3.7 | 4.1 |
| Plasma | Cortisol | 21.7 | 46.2 | 16.3 | 19.1 | 46.0 | 51.0 | 10.9 | 12.8 | 30.7 | 34.0 | 5.4 | 6.4 | 15.3 | 17.0 |
| Serum | Cortisol | 15.2 | 38.1 | 11.4 | 15.4 | 34.2 | 37.7 | 7.6 | 10.3 | 22.8 | 25.2 | 3.8 | 5.1 | 11.4 | 12.6 |
| Serum | C Peptide | 16.6 | 23.2 | 12.5 | 10.7 | 31.2 | 35.1 | 8.3 | 7.1 | 20.8 | 23.4 | 4.2 | 3.6 | 10.4 | 11.7 |
| Serum | Creatine kinase (CK) | 22.8 | 40 | 17.1 | 17.3 | 45.5 | 50.8 | 11.4 | 11.5 | 30.3 | 33.9 | 5.7 | 5.8 | 15.2 | 16.9 |
| Serum | Creatine kinase MB, % | 6.9 | 48.2 | 5.2 | 18.3 | 26.8 | 28.4 | 3.5 | 12.2 | 17.9 | 18.9 | 1.7 | 6.1 | 8.9 | 9.5 |
| Serum | Creatine kinase MB, activity | 19.7 | 24.3 | 14.8 | 11.7 | 36.1 | 40.7 | 9.9 | 7.8 | 24.1 | 27.1 | 4.9 | 3.9 | 12.0 | 13.6 |
| Serum | Creatine kinase MB, mass | 18.4 | 61.2 | 13.8 | 24.0 | 46.7 | 51.0 | 9.2 | 16.0 | 31.2 | 34.0 | 4.6 | 8.0 | 15.6 | 17.0 |
| Serum | Creatinine | 5.95 | 14.7 | 4.5 | 5.9 | 13.3 | 14.7 | 3.0 | 4.0 | 8.9 | 9.8 | 1.5 | 2.0 | 4.4 | 4.9 |
| Urine | Creatinine, concentration, 24h | 24 | 24.5 | 18.0 | 12.9 | 42.6 | 48.1 | 12.0 | 8.6 | 28.4 | 32.1 | 6.0 | 4.3 | 14.2 | 16.0 |
| Urine | Creatinine, concentration, first morning | 23.2 | 25.7 | 17.4 | 13.0 | 41.7 | 47.1 | 11.6 | 8.7 | 27.8 | 31.4 | 5.8 | 4.3 | 13.9 | 15.7 |
| Urine | Creatinine, concentration, random | 36.3 | 32.4 | 27.2 | 18.2 | 63.2 | 71.6 | 18.2 | 12.2 | 42.1 | 47.7 | 9.1 | 6.1 | 21.1 | 23.9 |
| Urine | Creatinine, output, 24h | 11 | 23 | 8.3 | 9.6 | 23.2 | 25.7 | 5.5 | 6.4 | 15.4 | 17.2 | 2.8 | 3.2 | 7.7 | 8.6 |
| Serum | C-Terminal telopeptide type I collagen (CTY I) | 10.85 | 30.6 | 8.1 | 12.2 | 25.6 | 28.1 | 5.4 | 8.1 | 17.1 | 18.7 | 2.7 | 4.1 | 8.5 | 9.4 |
| Serum | Cyfra 21.1 Antigen | 22.2 | 31.1 | 16.7 | 14.3 | 41.8 | 47.0 | 11.1 | 9.6 | 27.9 | 31.3 | 5.6 | 4.8 | 13.9 | 15.7 |
| Plasma | Cystatin C | 5.5 | --- | 4.1 | | 6.8 | 8.1 | 2.8 | | 4.5 | 5.4 | 1.4 | | 2.3 | 2.7 |

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|-------------------|---|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Serum | Cystatin C | 5 | 13 | 3.8 | 5.2 | 11.4 | 12.6 | 2.5 | 3.5 | 7.6 | 8.4 | 1.3 | 1.7 | 3.8 | 4.2 |
| Plasma | Cysteine | 5.9 | 12.3 | 4.4 | 5.1 | 12.4 | 13.8 | 3.0 | 3.4 | 8.3 | 9.2 | 1.5 | 1.7 | 4.1 | 4.6 |
| Plasma | Cystine | 38.3 | 48.5 | 28.7 | 23.2 | 70.6 | 79.5 | 19.2 | 15.4 | 47.0 | 53.0 | 9.6 | 7.7 | 23.5 | 26.5 |
| Serum | D-Dimer (MoM) | 23.3 | 26.5 | 17.5 | 13.2 | 42.1 | 47.5 | 11.7 | 8.8 | 28.0 | 31.7 | 5.8 | 4.4 | 14.0 | 15.8 |
| Serum | Dehydroepiandrosterone sulfate (DHEAS) | 6.35 | 30.7 | 4.8 | 11.8 | 19.6 | 21.1 | 3.2 | 7.8 | 13.1 | 14.1 | 1.6 | 3.9 | 6.5 | 7.0 |
| Urine | Deoxypyridinoline/creatinine, 24h | 16 | 30.7 | 12.0 | 13.0 | 32.8 | 36.5 | 8.0 | 8.7 | 21.9 | 24.3 | 4.0 | 4.3 | 10.9 | 12.2 |
| Urine | Deoxypyridinoline/creatinine, first morning | 13.8 | 34.6 | 10.4 | 14.0 | 31.0 | 34.3 | 6.9 | 9.3 | 20.7 | 22.8 | 3.5 | 4.7 | 10.3 | 11.4 |
| Urine | Deoxypyridinoline/minute, first morning | 15.4 | 30.3 | 11.6 | 12.7 | 31.8 | 35.4 | 7.7 | 8.5 | 21.2 | 23.6 | 3.9 | 4.2 | 10.6 | 11.8 |
| Plasma | Dipeptidyl-peptidase IV (ACE) | 8.2 | 14.5 | 6.2 | 6.2 | 16.4 | 18.3 | 4.1 | 4.2 | 10.9 | 12.2 | 2.1 | 2.1 | 5.5 | 6.1 |
| Serum | Dipeptidyl-peptidase IV (ACE) | 12.5 | 27.7 | 9.4 | 11.4 | 26.9 | 29.8 | 6.3 | 7.6 | 17.9 | 19.8 | 3.1 | 3.8 | 9.0 | 9.9 |
| Plasma | Elastase | 12.4 | 15.1 | 9.3 | 7.3 | 22.7 | 25.6 | 6.2 | 4.9 | 15.1 | 17.0 | 3.1 | 2.4 | 7.6 | 8.5 |
| Blood | Eosinophils, count | 21 | 76.4 | 15.8 | 29.7 | 55.7 | 60.6 | 10.5 | 19.8 | 37.1 | 40.4 | 5.3 | 9.9 | 18.6 | 20.2 |
| Blood/Platelet | Epinephrine | 25.3 | --- | 19.0 | | 31.3 | 37.2 | 12.7 | | 20.9 | 24.8 | 6.3 | | 10.4 | 12.4 |
| Plasma | Epinephrine | 48.3 | --- | 36.2 | | 59.8 | 71.0 | 24.2 | | 39.8 | 47.3 | 12.1 | | 19.9 | 23.7 |
| Blood | Erythrocytes, count | 3.2 | 6.3 | 2.4 | 2.6 | 6.6 | 7.4 | 1.6 | 1.8 | 4.4 | 4.9 | 0.8 | 0.9 | 2.2 | 2.5 |
| Blood | Erythrocyte distribution wide | 3.5 | 5.7 | 2.6 | 2.5 | 6.8 | 7.7 | 1.8 | 1.7 | 4.6 | 5.1 | 0.9 | 0.8 | 2.3 | 2.6 |
| Urine | Estradiol | 30.4 | --- | 22.8 | | 37.6 | 44.7 | 15.2 | | 25.1 | 29.8 | 7.6 | | 12.5 | 14.9 |
| Serum | Estradiol | 22.5 | 24.4 | 16.9 | 12.4 | 40.3 | 45.5 | 11.3 | 8.3 | 26.9 | 30.3 | 5.6 | 4.1 | 13.4 | 15.2 |
| Serum | Estradiol, free | 22.8 | --- | 17.1 | | 28.2 | 33.5 | 11.4 | | 18.8 | 22.3 | 5.7 | | 9.4 | 11.2 |
| Urine | Estradiol, free | 38.6 | --- | 29.0 | | 47.8 | 56.7 | 19.3 | | 31.8 | 37.8 | 9.7 | | 15.9 | 18.9 |
| Plasma | Factor V coagulation | 3.6 | --- | 2.7 | | 4.5 | 5.3 | 1.8 | | 3.0 | 3.5 | 0.9 | | 1.5 | 1.8 |
| Plasma | Factor VII coagulation | 6.8 | 19.4 | 5.1 | 7.7 | 16.1 | 17.7 | 3.4 | 5.1 | 10.7 | 11.8 | 1.7 | 2.6 | 5.4 | 5.9 |
| Plasma | Factor VIII coagulation | 4.8 | 19.1 | 3.6 | 7.4 | 13.3 | 14.4 | 2.4 | 4.9 | 8.9 | 9.6 | 1.2 | 2.5 | 4.4 | 4.8 |
| Plasma | Factor X coagulation | 5.9 | --- | 4.4 | | 7.3 | 8.7 | 3.0 | | 4.9 | 5.8 | 1.5 | | 2.4 | 2.9 |
| Serum | Ferritin | 14.2 | 15 | 10.7 | 7.7 | 25.3 | 28.6 | 7.1 | 5.2 | 16.9 | 19.1 | 3.6 | 2.6 | 8.4 | 9.5 |
| Plasma | Fibrinogen | 10.7 | 15.8 | 8.0 | 7.2 | 20.4 | 22.9 | 5.4 | 4.8 | 13.6 | 15.3 | 2.7 | 2.4 | 6.8 | 7.6 |
| Blood/Erythrocyte | Folate | 12 | 66 | 9.0 | 25.2 | 40.0 | 42.8 | 6.0 | 16.8 | 26.7 | 28.5 | 3.0 | 8.4 | 13.3 | 14.3 |
| Serum | Folate | 24 | 73 | 18.0 | 28.8 | 58.5 | 64.1 | 12.0 | 19.2 | 39.0 | 42.7 | 6.0 | 9.6 | 19.5 | 21.4 |

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|-------------|---|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Serum | Follicle stimulating hormone (FSH) | 11 | 47.2 | 8.3 | 18.2 | 31.8 | 34.3 | 5.5 | 12.1 | 21.2 | 22.9 | 2.8 | 6.1 | 10.6 | 11.4 |
| Serum | Fructosamine | 3.4 | 5.9 | 2.6 | 2.6 | 6.8 | 7.6 | 1.7 | 1.7 | 4.5 | 5.0 | 0.9 | 0.9 | 2.3 | 2.5 |
| Serum | Galactosyl hydroxylysine | 11.8 | 25.8 | 8.9 | 10.6 | 25.2 | 28.0 | 5.9 | 7.1 | 16.8 | 18.7 | 3.0 | 3.5 | 8.4 | 9.3 |
| Plasma | Fibrinogen | 14.1 | 27.25 | 10.6 | 11.5 | 29.0 | 32.2 | 7.1 | 7.7 | 19.3 | 21.5 | 3.5 | 3.8 | 9.7 | 10.7 |
| Serum | Gamma-Globulins | 14.6 | 12.3 | 11.0 | 7.2 | 25.2 | 28.6 | 7.3 | 4.8 | 16.8 | 19.1 | 3.7 | 2.4 | 8.4 | 9.5 |
| Serum | Gamma-glutamyltransferase (GGT) | 13.4 | 42.15 | 10.1 | 16.6 | 33.2 | 36.3 | 6.7 | 11.1 | 22.1 | 24.2 | 3.4 | 5.5 | 11.1 | 12.1 |
| Serum | Globulins, total | 5.5 | 12.9 | 4.1 | 5.3 | 12.1 | 13.3 | 2.8 | 3.5 | 8.0 | 8.9 | 1.4 | 1.8 | 4.0 | 4.4 |
| Plasma | Glucose | 4.5 | 5.8 | 3.4 | 2.8 | 8.3 | 9.4 | 2.3 | 1.8 | 5.5 | 6.2 | 1.1 | 0.9 | 2.8 | 3.1 |
| Serum | Glucose | 5.6 | 7.5 | 4.2 | 3.5 | 10.4 | 11.7 | 2.8 | 2.3 | 7.0 | 7.8 | 1.4 | 1.2 | 3.5 | 3.9 |
| Erythrocyte | Glucose-6-phosphate-1-dehydrogenase (G6PDH) | 32.8 | 31.8 | 24.6 | 17.1 | 57.7 | 65.3 | 16.4 | 11.4 | 38.5 | 43.6 | 8.2 | 5.7 | 19.2 | 21.8 |
| Blood spot | Glucose-6-phosphate-1-dehydrogenase (G6PDH) | 7.3 | 10.3 | 5.5 | 4.7 | 13.8 | 15.5 | 3.7 | 3.2 | 9.2 | 10.3 | 1.8 | 1.6 | 4.6 | 5.2 |
| Plasma | Glutamic acid | 46.4 | 79.9 | 34.8 | 34.6 | 92.1 | 102.9 | 23.2 | 23.1 | 61.4 | 68.6 | 11.6 | 11.5 | 30.7 | 34.3 |
| Plasma | Glutamine | 12.1 | 22 | 9.1 | 9.4 | 24.4 | 27.2 | 6.1 | 6.3 | 16.3 | 18.1 | 3.0 | 3.1 | 8.1 | 9.1 |
| Serum | Glutathion peroxidase | 7.2 | 21.7 | 5.4 | 8.6 | 17.5 | 19.2 | 3.6 | 5.7 | 11.7 | 12.8 | 1.8 | 2.9 | 5.8 | 6.4 |
| Plasma | Glycine | 11.8 | 40.3 | 8.9 | 15.7 | 30.3 | 33.1 | 5.9 | 10.5 | 20.2 | 22.1 | 3.0 | 5.2 | 10.1 | 11.0 |
| Plasma | Haptoglobin | 20 | 27.9 | 15.0 | 12.9 | 37.6 | 42.3 | 10.0 | 8.6 | 25.1 | 28.2 | 5.0 | 4.3 | 12.5 | 14.1 |
| Serum | Haptoglobin | 20.4 | 36.4 | 15.3 | 15.6 | 40.9 | 45.6 | 10.2 | 10.4 | 27.3 | 30.4 | 5.1 | 5.2 | 13.6 | 15.2 |
| Serum | HDL cholesterol | 7.3 | 21.2 | 5.5 | 8.4 | 17.4 | 19.1 | 3.7 | 5.6 | 11.6 | 12.8 | 1.8 | 2.8 | 5.8 | 6.4 |
| Serum | HDL 1 cholesterol | 5.5 | 27.2 | 4.1 | 10.4 | 17.2 | 18.5 | 2.8 | 6.9 | 11.5 | 12.3 | 1.4 | 3.5 | 5.7 | 6.2 |
| Serum | HDL 2 cholesterol | 15.7 | 40.7 | 11.8 | 16.4 | 35.8 | 39.4 | 7.9 | 10.9 | 23.9 | 26.3 | 3.9 | 5.5 | 11.9 | 13.1 |
| Serum | HDL 3 cholesterol | 7 | 14.3 | 5.3 | 6.0 | 14.6 | 16.3 | 3.5 | 4.0 | 9.8 | 10.8 | 1.8 | 2.0 | 4.9 | 5.4 |
| Blood | Hematocrit | 2.7 | 6.41 | 2.0 | 2.6 | 5.9 | 6.6 | 1.4 | 1.7 | 4.0 | 4.4 | 0.7 | 0.9 | 2.0 | 2.2 |
| Blood | Hemoglobin | 2.85 | 6.8 | 2.1 | 2.8 | 6.3 | 7.0 | 1.4 | 1.8 | 4.2 | 4.6 | 0.7 | 0.9 | 2.1 | 2.3 |
| Blood | Hemoglobin A1 C | 1.9 | 5.7 | 1.4 | 2.3 | 4.6 | 5.0 | 1.0 | 1.5 | 3.1 | 3.4 | 0.5 | 0.8 | 1.5 | 1.7 |
| Blood | Hemoglobin A2 | 0.7 | 7.7 | 0.5 | 2.9 | 3.8 | 3.9 | 0.4 | 1.9 | 2.5 | 2.6 | 0.2 | 1.0 | 1.3 | 1.3 |
| Plasma | Histidine | 9.7 | 27.2 | 7.3 | 10.8 | 22.8 | 25.1 | 4.9 | 7.2 | 15.2 | 16.7 | 2.4 | 3.6 | 7.6 | 8.4 |
| Plasma | Homocysteine | 8.3 | 33.5 | 6.2 | 12.9 | 23.2 | 25.1 | 4.2 | 8.6 | 15.5 | 16.8 | 2.1 | 4.3 | 7.7 | 8.4 |
| Serum | Hyaluronic acid | 62 | --- | 46.5 | | 76.7 | 91.1 | 31.0 | | 51.2 | 60.8 | 15.5 | | 25.6 | 30.4 |
| Serum | Hydroxybutyrate dehydrogenase | 6.6 | --- | 5.0 | | 8.2 | 9.7 | 3.3 | | 5.4 | 6.5 | 1.7 | | 2.7 | 3.2 |

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|-----------------|--|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Plasma | Hydroxyproline | 34.5 | 56.7 | 25.9 | 24.9 | 67.6 | 75.6 | 17.3 | 16.6 | 45.1 | 50.4 | 8.6 | 8.3 | 22.5 | 25.2 |
| Urine | Hydroxyproline/minute, first morning | 36.1 | 38.8 | 27.1 | 19.9 | 64.5 | 72.9 | 18.1 | 13.2 | 43.0 | 48.6 | 9.0 | 6.6 | 21.5 | 24.3 |
| Urine | Hydroxyproline/minute, second void | 40.5 | 32.9 | 30.4 | 19.6 | 69.7 | 79.1 | 20.3 | 13.0 | 46.5 | 52.7 | 10.1 | 6.5 | 23.2 | 26.4 |
| Serum | Immunoglobulin A | 5.4 | 35.9 | 4.1 | 13.6 | 20.3 | 21.6 | 2.7 | 9.1 | 13.5 | 14.4 | 1.4 | 4.5 | 6.8 | 7.2 |
| Serum | Immunoglobulin G | 4.5 | 16.5 | 3.4 | 6.4 | 12.0 | 13.0 | 2.3 | 4.3 | 8.0 | 8.7 | 1.1 | 2.1 | 4.0 | 4.3 |
| Serum | Immunoglobulin M | 5.9 | 47.3 | 4.4 | 17.9 | 25.2 | 26.5 | 3.0 | 11.9 | 16.8 | 17.7 | 1.5 | 6.0 | 8.4 | 8.8 |
| Serum | Immunoglobulins κ chains | 4.8 | 15.3 | 3.6 | 6.0 | 12.0 | 13.1 | 2.4 | 4.0 | 8.0 | 8.7 | 1.2 | 2.0 | 4.0 | 4.4 |
| Serum | Immunoglobulins λ chains | 4.8 | 18 | 3.6 | 7.0 | 12.9 | 14.0 | 2.4 | 4.7 | 8.6 | 9.4 | 1.2 | 2.3 | 4.3 | 4.7 |
| Serum | Inhibin B | 10 | 25 | 7.5 | 10.1 | 22.5 | 24.8 | 5.0 | 6.7 | 15.0 | 16.5 | 2.5 | 3.4 | 7.5 | 8.3 |
| Serum | Insulin | 21.1 | 58.3 | 15.8 | 23.3 | 49.4 | 54.3 | 10.6 | 15.5 | 32.9 | 36.2 | 5.3 | 7.8 | 16.5 | 18.1 |
| Serum | Insulin-like growth factor (IGF-1) | 14.6 | 45.4 | 11.0 | 17.9 | 36.0 | 39.3 | 7.3 | 11.9 | 24.0 | 26.2 | 3.7 | 6.0 | 12.0 | 13.1 |
| Serum | Insulin-like growth factor binding protein 3 (IGFBP ₃) | 10.1 | 63.9 | 7.6 | 24.3 | 36.8 | 39.1 | 5.1 | 16.2 | 24.5 | 26.1 | 2.5 | 8.1 | 12.3 | 13.0 |
| Serum | Intercellular adhesion molecule-1 (ICAM-1) | 1.9 | 21 | 1.4 | 7.9 | 10.3 | 10.7 | 1.0 | 5.3 | 6.8 | 7.1 | 0.5 | 2.6 | 3.4 | 3.6 |
| Blood Leukocyte | Interferon receptor | 14 | 20 | 10.5 | 9.2 | 26.5 | 29.7 | 7.0 | 6.1 | 17.7 | 19.8 | 3.5 | 3.1 | 8.8 | 9.9 |
| Serum | Interleukin 1-Beta | 30 | 36 | 22.5 | 17.6 | 54.7 | 61.7 | 15.0 | 11.7 | 36.5 | 41.1 | 7.5 | 5.9 | 18.2 | 20.6 |
| Serum | Interleukin-8 | 24 | 31 | 18.0 | 14.7 | 44.4 | 50.0 | 12.0 | 9.8 | 29.6 | 33.3 | 6.0 | 4.9 | 14.8 | 16.7 |
| Serum | Iron | 26.5 | 23.2 | 19.9 | 13.2 | 46.0 | 52.2 | 13.3 | 8.8 | 30.7 | 34.8 | 6.6 | 4.4 | 15.3 | 17.4 |
| Plasma | Isoleucine | 15.5 | 45.5 | 11.6 | 18.0 | 37.2 | 40.8 | 7.8 | 12.0 | 24.8 | 27.2 | 3.9 | 6.0 | 12.4 | 13.6 |
| Serum | Kallicrein 6 | 11.8 | 27.6 | 8.9 | 11.3 | 25.9 | 28.6 | 5.9 | 7.5 | 17.2 | 19.1 | 3.0 | 3.8 | 8.6 | 9.5 |
| Blood | Lactate | 27.2 | 16.7 | 20.4 | 12.0 | 45.6 | 52.0 | 13.6 | 8.0 | 30.4 | 34.6 | 6.8 | 4.0 | 15.2 | 17.3 |
| Serum | Lactate dehydrogenase (LDH) | 8.6 | 14.7 | 6.5 | 6.4 | 17.0 | 19.0 | 4.3 | 4.3 | 11.4 | 12.7 | 2.2 | 2.1 | 5.7 | 6.3 |
| Serum | Lactate dehydrogenase 1 isoform (LDH1) | 2.3 | 8.3 | 1.7 | 3.2 | 6.1 | 6.6 | 1.2 | 2.2 | 4.1 | 4.4 | 0.6 | 1.1 | 2.0 | 2.2 |
| Serum | Lactate dehydrogenase 2 isoform (LDH2) | 3.3 | 2.4 | 2.5 | 1.5 | 5.6 | 6.4 | 1.7 | 1.0 | 3.7 | 4.3 | 0.8 | 0.5 | 1.9 | 2.1 |
| Serum | Lactate dehydrogenase 3 isoform (LDH3) | 2.8 | 3.8 | 2.1 | 1.8 | 5.2 | 5.9 | 1.4 | 1.2 | 3.5 | 3.9 | 0.7 | 0.6 | 1.7 | 2.0 |

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|-----------------|--|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Serum | Lactate dehydrogenase 4 isoform (LDH4) | 5.9 | 5.3 | 4.4 | 3.0 | 10.3 | 11.6 | 3.0 | 2.0 | 6.9 | 7.8 | 1.5 | 1.0 | 3.4 | 3.9 |
| Serum | Lactate dehydrogenase 5 isoform (LDH5) | 8 | 9.6 | 6.0 | 4.7 | 14.6 | 16.4 | 4.0 | 3.1 | 9.7 | 11.0 | 2.0 | 1.6 | 4.9 | 5.5 |
| Plasma | Lactoferrin | 11.8 | 23.7 | 8.9 | 9.9 | 24.5 | 27.3 | 5.9 | 6.6 | 16.4 | 18.2 | 3.0 | 3.3 | 8.2 | 9.1 |
| Serum | LDL Cholesterol | 7.8 | 20.4 | 5.9 | 8.2 | 17.8 | 19.7 | 3.9 | 5.5 | 11.9 | 13.1 | 2.0 | 2.7 | 5.9 | 6.6 |
| Plasma | LDL Cholesterol (oxidized) | 21 | 50 | 15.8 | 20.3 | 46.3 | 51.2 | 10.5 | 13.6 | 30.9 | 34.1 | 5.3 | 6.8 | 15.4 | 17.1 |
| Serum | LDL Cholesterol, small dense | 9.1 | 20 | 6.8 | 8.2 | 19.5 | 21.6 | 4.6 | 5.5 | 13.0 | 14.4 | 2.3 | 2.7 | 6.5 | 7.2 |
| Serum | LDL receptor mRNA | 21.5 | 13.6 | 16.1 | 9.5 | 36.1 | 41.1 | 10.8 | 6.4 | 24.1 | 27.4 | 5.4 | 3.2 | 12.0 | 13.7 |
| Plasma | Leucine | 14.8 | 44 | 11.1 | 17.4 | 35.7 | 39.2 | 7.4 | 11.6 | 23.8 | 26.1 | 3.7 | 5.8 | 11.9 | 13.1 |
| Blood | Leukocytes count | 11.4 | 21.3 | 8.6 | 9.1 | 23.2 | 25.8 | 5.7 | 6.0 | 15.4 | 17.2 | 2.9 | 3.0 | 7.7 | 8.6 |
| Serum | Lipase | 32.2 | 31.8 | 24.2 | 17.0 | 56.8 | 64.3 | 16.1 | 11.3 | 37.9 | 42.9 | 8.1 | 5.7 | 18.9 | 21.4 |
| Serum | Lipoprotein (a) | 20.8 | 18.1 | 15.6 | 10.3 | 36.1 | 40.9 | 10.4 | 6.9 | 24.1 | 27.3 | 5.2 | 3.4 | 12.0 | 13.6 |
| Plasma | Lutein | 13 | 21 | 9.8 | 9.3 | 25.3 | 28.4 | 6.5 | 6.2 | 16.9 | 18.9 | 3.3 | 3.1 | 8.4 | 9.5 |
| Serum | Lutein | 23.7 | --- | 17.8 | | 29.3 | 34.8 | 11.9 | | 19.6 | 23.2 | 5.9 | | 9.8 | 11.6 |
| Serum | Luteinizing hormone (LH) | 23 | 27.4 | 17.3 | 13.4 | 41.9 | 47.2 | 11.5 | 8.9 | 27.9 | 31.5 | 5.8 | 4.5 | 14.0 | 15.7 |
| Plasma | Lycopene | 22 | 33 | 16.5 | 14.9 | 42.1 | 47.2 | 11.0 | 9.9 | 28.1 | 31.5 | 5.5 | 5.0 | 14.0 | 15.7 |
| Serum | Lycopene | 40.1 | 33 | 30.1 | 19.5 | 69.1 | 78.4 | 20.1 | 13.0 | 46.1 | 52.3 | 10.0 | 6.5 | 23.0 | 26.1 |
| Blood | Lymphocytes, count | 10.2 | 35.3 | 7.7 | 13.8 | 26.4 | 28.8 | 5.1 | 9.2 | 17.6 | 19.2 | 2.6 | 4.6 | 8.8 | 9.6 |
| Blood | Lymphocytes CD4 | 25 | --- | 18.8 | | 30.9 | 36.8 | 12.5 | | 20.6 | 24.5 | 6.3 | | 10.3 | 12.3 |
| Plasma | Lysine | 11.5 | 38.2 | 8.6 | 15.0 | 29.2 | 31.9 | 5.8 | 10.0 | 19.5 | 21.2 | 2.9 | 5.0 | 9.7 | 10.6 |
| Erythrocyte | Magnesium | 5.6 | 11.3 | 4.2 | 4.7 | 11.7 | 13.0 | 2.8 | 3.2 | 7.8 | 8.6 | 1.4 | 1.6 | 3.9 | 4.3 |
| Blood Leukocyte | Magnesium | 18.5 | 12.4 | 13.9 | 8.4 | 31.2 | 35.5 | 9.3 | 5.6 | 20.8 | 23.7 | 4.6 | 2.8 | 10.4 | 11.8 |
| Blood Monocyte | Magnesium | 18.1 | 20.3 | 13.6 | 10.2 | 32.6 | 36.8 | 9.1 | 6.8 | 21.7 | 24.5 | 4.5 | 3.4 | 10.9 | 12.3 |
| Serum | Magnesium | 3.6 | 6.4 | 2.7 | 2.8 | 7.2 | 8.0 | 1.8 | 1.8 | 4.8 | 5.4 | 0.9 | 0.9 | 2.4 | 2.7 |
| Urine | Magnesium, ionized | 1.9 | 5.1 | 1.4 | 2.0 | 4.4 | 4.8 | 1.0 | 1.4 | 2.9 | 3.2 | 0.5 | 0.7 | 1.5 | 1.6 |
| Urine | Magnesium, output, 24h | 38.3 | 37.6 | 28.7 | 20.1 | 67.5 | 76.4 | 19.2 | 13.4 | 45.0 | 51.0 | 9.6 | 6.7 | 22.5 | 25.5 |
| Erythrocyte | Mean corpuscular hemoglobin (MCH) | 1.4 | 5.2 | 1.1 | 2.0 | 3.8 | 4.1 | 0.7 | 1.3 | 2.5 | 2.7 | 0.4 | 0.7 | 1.3 | 1.4 |
| Erythrocyte | Mean corpuscular hemoglobin concentration (MCHC) | 1.06 | 1.2 | 0.8 | 0.6 | 1.9 | 2.2 | 0.5 | 0.4 | 1.3 | 1.4 | 0.3 | 0.2 | 0.6 | 0.7 |
| Erythrocyte | Mean corpuscular volume (MCV) | 1.4 | 4.85 | 1.1 | 1.9 | 3.6 | 4.0 | 0.7 | 1.3 | 2.4 | 2.6 | 0.4 | 0.6 | 1.2 | 1.3 |

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|----------------|--|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Blood/Platelet | Mean platelet volume (MPV) | 4.3 | 8.1 | 3.2 | 3.4 | 8.8 | 9.8 | 2.2 | 2.3 | 5.8 | 6.5 | 1.1 | 1.1 | 2.9 | 3.3 |
| Plasma | Metionine | 14.7 | 43.4 | 11.0 | 17.2 | 35.4 | 38.8 | 7.4 | 11.5 | 23.6 | 25.9 | 3.7 | 5.7 | 11.8 | 12.9 |
| Blood | Monocytes, count | 17.8 | 49.8 | 13.4 | 19.8 | 41.9 | 46.0 | 8.9 | 13.2 | 27.9 | 30.7 | 4.5 | 6.6 | 14.0 | 15.3 |
| Serum | Myeloperoxidase | 36 | 30 | 27.0 | 17.6 | 62.1 | 70.5 | 18.0 | 11.7 | 41.4 | 47.0 | 9.0 | 5.9 | 20.7 | 23.5 |
| Serum | Myoglobin | 13.9 | 29.6 | 10.4 | 12.3 | 29.5 | 32.7 | 7.0 | 8.2 | 19.6 | 21.8 | 3.5 | 4.1 | 9.8 | 10.9 |
| Urine | N-Acetyl Glucosaminidase, concentration, first morning | 52.9 | 22 | 39.7 | 21.5 | 86.9 | 99.2 | 26.5 | 14.3 | 58.0 | 66.2 | 13.2 | 7.2 | 29.0 | 33.1 |
| Urine | N-Acetyl Glucosaminidase/Creatinine | 51.1 | 21.8 | 38.3 | 20.8 | 84.1 | 96.0 | 25.6 | 13.9 | 56.0 | 64.0 | 12.8 | 6.9 | 28.0 | 32.0 |
| Blood | Neutrophyles, count | 17.1 | 32.8 | 12.8 | 13.9 | 35.0 | 39.0 | 8.6 | 9.2 | 23.4 | 26.0 | 4.3 | 4.6 | 11.7 | 13.0 |
| Urine | Nitrogen, output | 13.9 | 24.2 | 10.4 | 10.5 | 27.7 | 30.9 | 7.0 | 7.0 | 18.4 | 20.6 | 3.5 | 3.5 | 9.2 | 10.3 |
| Blood/Platelet | Norepinephrine | 9.5 | --- | 7.1 | | 11.8 | 14.0 | 4.8 | | 7.8 | 9.3 | 2.4 | | 3.9 | 4.7 |
| Plasma | Norepinephrine | 19.5 | --- | 14.6 | | 24.1 | 28.7 | 9.8 | | 16.1 | 19.1 | 4.9 | | 8.0 | 9.6 |
| Urine | N-Telopeptide type I collagen | 15.5 | 37.6 | 11.6 | 15.3 | 34.4 | 38.0 | 7.8 | 10.2 | 23.0 | 25.4 | 3.9 | 5.1 | 11.5 | 12.7 |
| Serum | N-terminal (NT)-proBNP | 10 | 16 | 7.5 | 7.1 | 19.5 | 21.8 | 5.0 | 4.7 | 13.0 | 14.5 | 2.5 | 2.4 | 6.5 | 7.3 |
| Plasma | Ornithine | 18.4 | 54.9 | 13.8 | 21.7 | 44.5 | 48.8 | 9.2 | 14.5 | 29.7 | 32.5 | 4.6 | 7.2 | 14.8 | 16.3 |
| Plasma | Osmolality | 1.3 | 1.5 | 1.0 | 0.7 | 2.4 | 2.7 | 0.7 | 0.5 | 1.6 | 1.8 | 0.3 | 0.2 | 0.8 | 0.9 |
| Saliva | Osmolality | 9.5 | 35.8 | 7.1 | 13.9 | 25.6 | 27.9 | 4.8 | 9.3 | 17.1 | 18.6 | 2.4 | 4.6 | 8.5 | 9.3 |
| Serum | Osmolality | 1.3 | 1.2 | 1.0 | 0.7 | 2.3 | 2.6 | 0.7 | 0.4 | 1.5 | 1.7 | 0.3 | 0.2 | 0.8 | 0.9 |
| Urine | Osmolality, first morning | 28.3 | 57.9 | 21.2 | 24.2 | 59.2 | 65.8 | 14.2 | 16.1 | 39.5 | 43.8 | 7.1 | 8.1 | 19.7 | 21.9 |
| Serum | Osteocalcin | 6.35 | 30.9 | 4.8 | 11.8 | 19.7 | 21.2 | 3.2 | 7.9 | 13.1 | 14.1 | 1.6 | 3.9 | 6.6 | 7.1 |
| Urine | Oxalate, concentration, 24h | 44 | 18 | 33.0 | 17.8 | 72.3 | 82.5 | 22.0 | 11.9 | 48.2 | 55.0 | 11.0 | 5.9 | 24.1 | 27.5 |
| Urine | Oxalate, output, 24h | 42.5 | 19.9 | 31.9 | 17.6 | 70.2 | 80.1 | 21.3 | 11.7 | 46.8 | 53.4 | 10.6 | 5.9 | 23.4 | 26.7 |
| Blood | pCO2 | 4.8 | 5.3 | 3.6 | 2.7 | 8.6 | 9.7 | 2.4 | 1.8 | 5.7 | 6.5 | 1.2 | 0.9 | 2.9 | 3.2 |
| Blood | pH [H+] | 3.5 | 2 | 2.6 | 1.5 | 5.8 | 6.7 | 1.8 | 1.0 | 3.9 | 4.4 | 0.9 | 0.5 | 1.9 | 2.2 |
| Blood | pH (pH units) | 0.2 | --- | 0.2 | | 0.2 | 0.3 | 0.1 | | 0.2 | 0.2 | 0.1 | | 0.1 | 0.1 |
| Serum | Paraoxonase 1 | 13.4 | 84 | 10.1 | 31.9 | 48.5 | 51.6 | 6.7 | 21.3 | 32.3 | 34.4 | 3.4 | 10.6 | 16.2 | 17.2 |
| Serum | Paraoxonase 1 substrate inhibition (PON 4SI) | 3.9 | 80.1 | 2.9 | 30.1 | 34.9 | 35.8 | 2.0 | 20.0 | 23.3 | 23.9 | 1.0 | 10.0 | 11.6 | 11.9 |
| Serum | Paraoxonase, activity (salt stimulated) | 8 | 86.4 | 6.0 | 32.5 | 42.4 | 44.3 | 4.0 | 21.7 | 28.3 | 29.5 | 2.0 | 10.8 | 14.1 | 14.8 |
| Plasma | Parathyroid hormone (PTH) | 25.3 | 43.4 | 19.0 | 18.8 | 50.1 | 56.0 | 12.7 | 12.6 | 33.4 | 37.4 | 6.3 | 6.3 | 16.7 | 18.7 |

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|-----------------|---|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Serum | Parathyroid hormone (PTH) | 25.9 | 23.8 | 19.4 | 13.2 | 45.2 | 51.3 | 13.0 | 8.8 | 30.2 | 34.2 | 6.5 | 4.4 | 15.1 | 17.1 |
| Serum | Phenylacetate | 6.6 | 25.2 | 5.0 | 9.8 | 17.9 | 19.5 | 3.3 | 6.5 | 12.0 | 13.0 | 1.7 | 3.3 | 6.0 | 6.5 |
| Plasma | Phenylalanine | 9.5 | 40.6 | 7.1 | 15.6 | 27.4 | 29.6 | 4.8 | 10.4 | 18.3 | 19.7 | 2.4 | 5.2 | 9.1 | 9.9 |
| Serum | Phosphate | 8.15 | 10.8 | 6.1 | 5.1 | 15.2 | 17.1 | 4.1 | 3.4 | 10.1 | 11.4 | 2.0 | 1.7 | 5.1 | 5.7 |
| Urine | Phosphate, output, 24h | 18 | 22.6 | 13.5 | 10.8 | 33.1 | 37.3 | 9.0 | 7.2 | 22.1 | 24.9 | 4.5 | 3.6 | 11.0 | 12.4 |
| Patient- | Phosphate tubular reabsorption | 2.7 | 3.3 | 2.0 | 1.6 | 4.9 | 5.6 | 1.4 | 1.1 | 3.3 | 3.7 | 0.7 | 0.5 | 1.6 | 1.9 |
| Serum | Phospholipids | 6.5 | 11.1 | 4.9 | 4.8 | 12.9 | 14.4 | 3.3 | 3.2 | 8.6 | 9.6 | 1.6 | 1.6 | 4.3 | 4.8 |
| Plasma | Plasminogen | 7.7 | --- | 5.8 | | 9.5 | 11.3 | 3.9 | | 6.4 | 7.5 | 1.9 | | 3.2 | 3.8 |
| Blood | Platelets, count | 9.1 | 21.9 | 6.8 | 8.9 | 20.2 | 22.3 | 4.6 | 5.9 | 13.4 | 14.8 | 2.3 | 3.0 | 6.7 | 7.4 |
| Blood | Platelet distribution wide | 2.8 | --- | 2.1 | | 3.5 | 4.1 | 1.4 | | 2.3 | 2.7 | 0.7 | | 1.2 | 1.4 |
| Blood | Plateletcrit | 11.9 | --- | 8.9 | | 14.7 | 17.5 | 6.0 | | 9.8 | 11.7 | 3.0 | | 4.9 | 5.8 |
| Urine | Porphobilinogen | 17 | 31 | 12.8 | 13.3 | 34.3 | 38.2 | 8.5 | 8.8 | 22.9 | 25.5 | 4.3 | 4.4 | 11.4 | 12.7 |
| Urine | Porphyryns (total) | 40 | --- | 30.0 | | 49.5 | 58.8 | 20.0 | | 33.0 | 39.2 | 10.0 | | 16.5 | 19.6 |
| Blood Leukocyte | Potassium | 13.6 | 13.4 | 10.2 | 7.2 | 24.0 | 27.2 | 6.8 | 4.8 | 16.0 | 18.1 | 3.4 | 2.4 | 8.0 | 9.1 |
| Serum | Potassium | 4.6 | 5.6 | 3.5 | 2.7 | 8.4 | 9.5 | 2.3 | 1.8 | 5.6 | 6.3 | 1.2 | 0.9 | 2.8 | 3.2 |
| Urine | Potassium, output | 24.4 | 22.2 | 18.3 | 12.4 | 42.6 | 48.2 | 12.2 | 8.2 | 28.4 | 32.2 | 6.1 | 4.1 | 14.2 | 16.1 |
| Serum | Prealbumin | 10.9 | 19.1 | 8.2 | 8.2 | 21.7 | 24.3 | 5.5 | 5.5 | 14.5 | 16.2 | 2.7 | 2.7 | 7.2 | 8.1 |
| Serum | Pregnancy-associated plasma protein A (PAPP-A) | 12.6 | 14 | 9.5 | 7.1 | 22.7 | 25.6 | 6.3 | 4.7 | 15.1 | 17.1 | 3.2 | 2.4 | 7.6 | 8.5 |
| Plasma | Prolactin | 39.2 | 65.1 | 29.4 | 28.5 | 77.0 | 86.1 | 19.6 | 19.0 | 51.3 | 57.4 | 9.8 | 9.5 | 25.7 | 28.7 |
| Serum | Prolactin | 23 | 35 | 17.3 | 15.7 | 44.2 | 49.5 | 11.5 | 10.5 | 29.4 | 33.0 | 5.8 | 5.2 | 14.7 | 16.5 |
| Plasma | Proline | 17 | 104.4 | 12.8 | 39.7 | 60.7 | 64.7 | 8.5 | 26.4 | 40.5 | 43.1 | 4.3 | 13.2 | 20.2 | 21.6 |
| Plasma | Prolyl endopeptidase | 16.8 | 13.9 | 12.6 | 8.2 | 29.0 | 32.9 | 8.4 | 5.5 | 19.3 | 21.9 | 4.2 | 2.7 | 9.7 | 11.0 |
| Serum | Properdin factor B | 9.5 | 11.2 | 7.1 | 5.5 | 17.3 | 19.5 | 4.8 | 3.7 | 11.5 | 13.0 | 2.4 | 1.8 | 5.8 | 6.5 |
| Serum | Prostatic specific antigen (PSA) | 18.1 | 72.4 | 13.6 | 28.0 | 50.4 | 54.6 | 9.1 | 18.7 | 33.6 | 36.4 | 4.5 | 9.3 | 16.8 | 18.2 |
| Serum | Protein | 2.75 | 4.7 | 2.1 | 2.0 | 5.4 | 6.1 | 1.4 | 1.4 | 3.6 | 4.1 | 0.7 | 0.7 | 1.8 | 2.0 |
| Serum | Protein, glycated | 0.9 | 11.6 | 0.7 | 4.4 | 5.5 | 5.7 | 0.5 | 2.9 | 3.7 | 3.8 | 0.2 | 1.5 | 1.8 | 1.9 |
| Urine | Protein, output, 24h | 35.5 | 23.7 | 26.6 | 16.0 | 59.9 | 68.2 | 17.8 | 10.7 | 40.0 | 45.5 | 8.9 | 5.3 | 20.0 | 22.7 |
| Plasma | Prothrombin time | 4 | 6.8 | 3.0 | 3.0 | 7.9 | 8.8 | 2.0 | 2.0 | 5.3 | 5.9 | 1.0 | 1.0 | 2.6 | 2.9 |
| Urine | Pyridinoline | 19.4 | 23.6 | 14.6 | 11.5 | 35.5 | 40.0 | 9.7 | 7.6 | 23.6 | 26.6 | 4.9 | 3.8 | 11.8 | 13.3 |
| Blood | Pyruvate | 15.2 | 13 | 11.4 | 7.5 | 26.3 | 29.8 | 7.6 | 5.0 | 17.5 | 19.9 | 3.8 | 2.5 | 8.8 | 9.9 |
| Serum | Receptor for advanced glycation end-products (RAGE) | 14.6 | 56.5 | 11.0 | 21.9 | 40.0 | 43.3 | 7.3 | 14.6 | 26.6 | 28.9 | 3.7 | 7.3 | 13.3 | 14.4 |

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|-----------------|--|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Blood | Red cell distribution wide (RDW) | 3.5 | 5.7 | 2.6 | 2.5 | 6.8 | 7.7 | 1.8 | 1.7 | 4.6 | 5.1 | 0.9 | 0.8 | 2.3 | 2.6 |
| Blood | Reticulocyte highly fluorescent, count | 10 | 62 | 7.5 | 23.6 | 35.9 | 38.3 | 5.0 | 15.7 | 24.0 | 25.5 | 2.5 | 7.9 | 12.0 | 12.8 |
| Blood | Reticulocyte low fluorescent, count | 1.6 | 4.9 | 1.2 | 1.9 | 3.9 | 4.3 | 0.8 | 1.3 | 2.6 | 2.9 | 0.4 | 0.6 | 1.3 | 1.4 |
| Blood | Reticulocyte medium fluorescent, count | 13 | 33 | 9.8 | 13.3 | 29.4 | 32.4 | 6.5 | 8.9 | 19.6 | 21.6 | 3.3 | 4.4 | 9.8 | 10.8 |
| Blood | Reticulocyte, count | 11 | 29 | 8.3 | 11.6 | 25.2 | 27.8 | 5.5 | 7.8 | 16.8 | 18.5 | 2.8 | 3.9 | 8.4 | 9.3 |
| Plasma | Retinol | 6.2 | 21 | 4.7 | 8.2 | 15.9 | 17.3 | 3.1 | 5.5 | 10.6 | 11.6 | 1.6 | 2.7 | 5.3 | 5.8 |
| Serum | Retinol | 13.6 | 19 | 10.2 | 8.8 | 25.6 | 28.8 | 6.8 | 5.8 | 17.1 | 19.2 | 3.4 | 2.9 | 8.5 | 9.6 |
| Serum | Rheumatoid factor | 8.5 | 24.5 | 6.4 | 9.7 | 20.2 | 22.2 | 4.3 | 6.5 | 13.5 | 14.8 | 2.1 | 3.2 | 6.7 | 7.4 |
| Serum | SCC antigen | 39.4 | 35.7 | 29.6 | 19.9 | 68.7 | 77.9 | 19.7 | 13.3 | 45.8 | 51.9 | 9.9 | 6.6 | 22.9 | 26.0 |
| Plasma | S Protein | 5.8 | 63.4 | 4.4 | 23.9 | 31.1 | 32.4 | 2.9 | 15.9 | 20.7 | 21.6 | 1.5 | 8.0 | 10.4 | 10.8 |
| Plasma | Selenium | 12 | 14 | 9.0 | 6.9 | 21.8 | 24.6 | 6.0 | 4.6 | 14.5 | 16.4 | 3.0 | 2.3 | 7.3 | 8.2 |
| Blood | Selenium | 12 | 12 | 9.0 | 6.4 | 21.2 | 24.0 | 6.0 | 4.2 | 14.1 | 16.0 | 3.0 | 2.1 | 7.1 | 8.0 |
| Plasma | Serine | 12.8 | 42.8 | 9.6 | 16.8 | 32.6 | 35.6 | 6.4 | 11.2 | 21.7 | 23.7 | 3.2 | 5.6 | 10.9 | 11.9 |
| Serum | Sex hormone binding globulin (SHBG) | 13.05 | 36.35 | 9.8 | 14.5 | 30.6 | 33.7 | 6.5 | 9.7 | 20.4 | 22.4 | 3.3 | 4.8 | 10.2 | 11.2 |
| Erythrocyte | Sodium | 1.8 | 12.4 | 1.4 | 4.7 | 6.9 | 7.3 | 0.9 | 3.1 | 4.6 | 4.9 | 0.5 | 1.6 | 2.3 | 2.4 |
| Blood Leukocyte | Sodium | 51 | 36.4 | 38.3 | 23.5 | 86.6 | 98.5 | 25.5 | 15.7 | 57.7 | 65.6 | 12.8 | 7.8 | 28.9 | 32.8 |
| Serum | Sodium | 0.6 | 0.7 | 0.5 | 0.3 | 1.1 | 1.2 | 0.3 | 0.2 | 0.7 | 0.8 | 0.2 | 0.1 | 0.4 | 0.4 |
| Blood | Sodium Bicarbonate | 4 | 4.8 | 3.0 | 2.3 | 7.3 | 8.2 | 2.0 | 1.6 | 4.9 | 5.5 | 1.0 | 0.8 | 2.4 | 2.7 |
| Serum | Sodium Bicarbonate | 4.8 | 4.7 | 3.6 | 2.5 | 8.5 | 9.6 | 2.4 | 1.7 | 5.6 | 6.4 | 1.2 | 0.8 | 2.8 | 3.2 |
| Sweat- | Sodium Chloride | 15 | 25 | 11.3 | 10.9 | 29.5 | 33.0 | 7.5 | 7.3 | 19.7 | 22.0 | 3.8 | 3.6 | 9.8 | 11.0 |
| Urine | Sodium, output, 24 h. | 28.7 | 16.7 | 21.5 | 12.5 | 48.0 | 54.6 | 14.4 | 8.3 | 32.0 | 36.4 | 7.2 | 4.2 | 16.0 | 18.2 |
| Plasma | Soluble CD163 | 9 | 35.9 | 6.8 | 13.9 | 25.0 | 27.1 | 4.5 | 9.3 | 16.7 | 18.1 | 2.3 | 4.6 | 8.3 | 9.0 |
| Urine | Specific gravity | 0.4 | 1 | 0.3 | 0.4 | 0.9 | 1.0 | 0.2 | 0.3 | 0.6 | 0.7 | 0.1 | 0.1 | 0.3 | 0.3 |
| Semen | Spermatozoa, concentration | 26.8 | 56.4 | 20.1 | 23.4 | 56.6 | 62.8 | 13.4 | 15.6 | 37.7 | 41.9 | 6.7 | 7.8 | 18.9 | 20.9 |
| Semen | Spermatozoa, morphology | 19.6 | 44 | 14.7 | 18.1 | 42.3 | 46.9 | 9.8 | 12.0 | 28.2 | 31.3 | 4.9 | 6.0 | 14.1 | 15.6 |
| Semen | Spermatozoa, progressive motility | 15.2 | 32.8 | 11.4 | 13.6 | 32.4 | 35.9 | 7.6 | 9.0 | 21.6 | 23.9 | 3.8 | 4.5 | 10.8 | 12.0 |
| Semen | Spermatozoa, fast progressive motility | 18.8 | 51.8 | 14.1 | 20.7 | 43.9 | 48.3 | 9.4 | 13.8 | 29.3 | 32.2 | 4.7 | 6.9 | 14.6 | 16.1 |

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|-------------|---|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Semen | Spermatozoa, total motility | 18.4 | 29.8 | 13.8 | 13.1 | 35.9 | 40.2 | 9.2 | 8.8 | 23.9 | 26.8 | 4.6 | 4.4 | 12.0 | 13.4 |
| Semen | Spermatozoa, vitality | 10.3 | 25.8 | 7.7 | 10.4 | 23.2 | 25.6 | 5.2 | 6.9 | 15.4 | 17.0 | 2.6 | 3.5 | 7.7 | 8.5 |
| Serum | Superoxide dismutase | 17.1 | 10.5 | 12.8 | 7.5 | 28.7 | 32.7 | 8.6 | 5.0 | 19.1 | 21.8 | 4.3 | 2.5 | 9.6 | 10.9 |
| Erythrocyte | Superoxide dismutase | 12.3 | 4.9 | 9.2 | 5.0 | 20.2 | 23.0 | 6.2 | 3.3 | 13.5 | 15.4 | 3.1 | 1.7 | 6.7 | 7.7 |
| Plasma | Taurine | 30.6 | 44 | 23.0 | 20.1 | 58.0 | 65.1 | 15.3 | 13.4 | 38.6 | 43.4 | 7.7 | 6.7 | 19.3 | 21.7 |
| Plasma | Testosterone | 12.6 | 40.8 | 9.5 | 16.0 | 31.6 | 34.5 | 6.3 | 10.7 | 21.1 | 23.0 | 3.2 | 5.3 | 10.5 | 11.5 |
| Serum | Testosterone | 9.25 | 22.05 | 6.9 | 9.0 | 20.4 | 22.6 | 4.6 | 6.0 | 13.6 | 15.0 | 2.3 | 3.0 | 6.8 | 7.5 |
| Saliva | Testosterone | 17.3 | 28.8 | 13.0 | 12.6 | 34.0 | 38.0 | 8.7 | 8.4 | 22.7 | 25.4 | 4.3 | 4.2 | 11.3 | 12.7 |
| Urine | Testosterone | 25 | --- | 18.8 | | 30.9 | 36.8 | 12.5 | | 20.6 | 24.5 | 6.3 | | 10.3 | 12.3 |
| Serum | Testosterone, free | 9.3 | --- | 7.0 | | 11.5 | 13.7 | 4.7 | | 7.7 | 9.1 | 2.3 | | 3.8 | 4.6 |
| Urine | Testosterone, free | 51.7 | --- | 38.8 | | 64.0 | 76.0 | 25.9 | | 42.7 | 50.7 | 12.9 | | 21.3 | 25.3 |
| Serum | Thyroglobulin | 14 | 39 | 10.5 | 15.5 | 32.9 | 36.1 | 7.0 | 10.4 | 21.9 | 24.1 | 3.5 | 5.2 | 11.0 | 12.0 |
| Serum | Thyroglobulin antibody | 8.5 | 82 | 6.4 | 30.9 | 41.4 | 43.4 | 4.3 | 20.6 | 27.6 | 28.9 | 2.1 | 10.3 | 13.8 | 14.5 |
| Serum | Thyroid peroxidase antibody | 11.3 | 147 | 8.5 | 55.3 | 69.3 | 71.9 | 5.7 | 36.9 | 46.2 | 47.9 | 2.8 | 18.4 | 23.1 | 24.0 |
| Plasma | Thyroid stimulating hormone (TSH) | 29.3 | 48.4 | 22.0 | 21.2 | 57.5 | 64.3 | 14.7 | 14.1 | 38.3 | 42.9 | 7.3 | 7.1 | 19.2 | 21.4 |
| Serum | Thyroid stimulating hormone (TSH) | 19.3 | 24.6 | 14.5 | 11.7 | 35.6 | 40.1 | 9.7 | 7.8 | 23.7 | 26.7 | 4.8 | 3.9 | 11.9 | 13.4 |
| Serum | Thyrotropin receptor antibody | 4.8 | --- | 3.6 | | 5.9 | 7.1 | 2.4 | | 4.0 | 4.7 | 1.2 | | 2.0 | 2.4 |
| Serum | Thyroxine (T4) | 4.9 | 10.9 | 3.7 | 4.5 | 10.5 | 11.7 | 2.5 | 3.0 | 7.0 | 7.8 | 1.2 | 1.5 | 3.5 | 3.9 |
| Plasma | Thyroxine, free (FT4) | 7.1 | 9.1 | 5.3 | 4.3 | 13.1 | 14.8 | 3.6 | 2.9 | 8.7 | 9.8 | 1.8 | 1.4 | 4.4 | 4.9 |
| Serum | Thyroxine, free (FT4) | 5.7 | 12.1 | 4.3 | 5.0 | 12.1 | 13.4 | 2.9 | 3.3 | 8.0 | 8.9 | 1.4 | 1.7 | 4.0 | 4.5 |
| Serum | Thyroxine binding globulin (TBG) | 0.09 | 0.06 | 0.1 | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.1 |
| Plasma | Tirosine | 10.5 | 61 | 7.9 | 23.2 | 36.2 | 38.6 | 5.3 | 15.5 | 24.1 | 25.8 | 2.6 | 7.7 | 12.1 | 12.9 |
| Serum | Tissue polypeptide antigen (TPA) | 31.1 | 63.7 | 23.3 | 26.6 | 65.1 | 72.3 | 15.6 | 17.7 | 43.4 | 48.2 | 7.8 | 8.9 | 21.7 | 24.1 |
| Serum | Tissue polypeptide specific antigen (TPS) | 36.1 | 108 | 27.1 | 42.7 | 87.4 | 95.8 | 18.1 | 28.5 | 58.3 | 63.8 | 9.0 | 14.2 | 29.1 | 31.9 |
| Urine | Total catecholamines, concentration, 24h | 24 | 32 | 18.0 | 15.0 | 44.7 | 50.3 | 12.0 | 10.0 | 29.8 | 33.5 | 6.0 | 5.0 | 14.9 | 16.8 |
| Serum | Transferrin | 3 | 4.3 | 2.3 | 2.0 | 5.7 | 6.4 | 1.5 | 1.3 | 3.8 | 4.3 | 0.8 | 0.7 | 1.9 | 2.1 |
| Plasma | Treonine | 17.9 | 33.1 | 13.4 | 14.1 | 36.3 | 40.4 | 9.0 | 9.4 | 24.2 | 26.9 | 4.5 | 4.7 | 12.1 | 13.5 |
| Serum | Triglyceride | 19.9 | 32.7 | 14.9 | 14.4 | 39.0 | 43.6 | 10.0 | 9.6 | 26.0 | 29.1 | 5.0 | 4.8 | 13.0 | 14.5 |

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|-------------------|---|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Plasma | Triiodothyronine (T3) | 9.4 | 18.5 | 7.1 | 7.8 | 19.4 | 21.6 | 4.7 | 5.2 | 12.9 | 14.4 | 2.4 | 2.6 | 6.5 | 7.2 |
| Serum | Triiodothyronine (T3) | 6.9 | 12.3 | 5.2 | 5.3 | 13.8 | 15.4 | 3.5 | 3.5 | 9.2 | 10.3 | 1.7 | 1.8 | 4.6 | 5.1 |
| Serum | Triiodothyronine, free (FT3) | 7.9 | 17.6 | 5.9 | 7.2 | 17.0 | 18.8 | 4.0 | 4.8 | 11.3 | 12.6 | 2.0 | 2.4 | 5.7 | 6.3 |
| Plasma | Troponin I | 37.1 | 179.2 | 27.8 | 68.6 | 114.5 | 123.2 | 18.6 | 45.8 | 76.4 | 82.1 | 9.3 | 22.9 | 38.2 | 41.1 |
| Serum | Troponin I | 14.05 | 63.75 | 10.5 | 24.5 | 41.9 | 45.1 | 7.0 | 16.3 | 27.9 | 30.1 | 3.5 | 8.2 | 14.0 | 15.0 |
| Serum | Troponin T | 30.5 | 90 | 22.9 | 35.6 | 73.4 | 80.5 | 15.3 | 23.8 | 48.9 | 53.6 | 7.6 | 11.9 | 24.5 | 26.8 |
| Plasma | Tryptophan | 22.7 | 152.6 | 17.0 | 57.9 | 85.9 | 91.2 | 11.4 | 38.6 | 57.3 | 60.8 | 5.7 | 19.3 | 28.6 | 30.4 |
| Serum | Tumor Necrosis Factor-a (TNF-a) | 43 | 29 | 32.3 | 19.4 | 72.7 | 82.7 | 21.5 | 13.0 | 48.4 | 55.1 | 10.8 | 6.5 | 24.2 | 27.6 |
| Serum | Urate | 8.6 | 17.5 | 6.5 | 7.3 | 18.0 | 20.0 | 4.3 | 4.9 | 12.0 | 13.3 | 2.2 | 2.4 | 6.0 | 6.7 |
| Urine | Urate, output, 24h | 16.8 | 14.4 | 12.6 | 8.3 | 29.1 | 33.0 | 8.4 | 5.5 | 19.4 | 22.0 | 4.2 | 2.8 | 9.7 | 11.0 |
| Serum | Urea | 12.1 | 18.7 | 9.1 | 8.4 | 23.3 | 26.1 | 6.1 | 5.6 | 15.6 | 17.4 | 3.0 | 2.8 | 7.8 | 8.7 |
| Urine | Urea, output, 24h | 17.4 | 25.4 | 13.1 | 11.5 | 33.1 | 37.1 | 8.7 | 7.7 | 22.1 | 24.7 | 4.4 | 3.8 | 11.0 | 12.4 |
| Plasma | Valine | 10.6 | 40.1 | 8.0 | 15.6 | 28.7 | 31.1 | 5.3 | 10.4 | 19.1 | 20.8 | 2.7 | 5.2 | 9.6 | 10.4 |
| Urine | Vanilmandelic Acid concentration, 24h | 22.2 | 47 | 16.7 | 19.5 | 47.0 | 52.1 | 11.1 | 13.0 | 31.3 | 34.8 | 5.6 | 6.5 | 15.7 | 17.4 |
| Serum | Vascular cell adhesion molecule-1 (VCAM-1) | 5.2 | 16 | 3.9 | 6.3 | 12.7 | 14.0 | 2.6 | 4.2 | 8.5 | 9.3 | 1.3 | 2.1 | 4.2 | 4.7 |
| Plasma | Vascular endothelial growth factor | 14.1 | 18.1 | 10.6 | 8.6 | 26.1 | 29.3 | 7.1 | 5.7 | 17.4 | 19.6 | 3.5 | 2.9 | 8.7 | 9.8 |
| Blood | Vascular endothelial growth factor | 14.3 | 28.8 | 10.7 | 12.1 | 29.8 | 33.1 | 7.2 | 8.0 | 19.8 | 22.1 | 3.6 | 4.0 | 9.9 | 11.0 |
| Serum | Vascular endothelial growth factor | 10.7 | 47.6 | 8.0 | 18.3 | 31.5 | 34.0 | 5.4 | 12.2 | 21.0 | 22.7 | 2.7 | 6.1 | 10.5 | 11.3 |
| Plasma | Vitamin B1 | 4.8 | 12 | 3.6 | 4.8 | 10.8 | 11.9 | 2.4 | 3.2 | 7.2 | 7.9 | 1.2 | 1.6 | 3.6 | 4.0 |
| Blood | Vitamin B2 (Riboflavin) | 5.8 | 10 | 4.4 | 4.3 | 11.5 | 12.9 | 2.9 | 2.9 | 7.7 | 8.6 | 1.5 | 1.4 | 3.8 | 4.3 |
| Blood/Erythrocyte | Vitamin B2 (Riboflavin) | 6.4 | 11 | 4.8 | 4.8 | 12.7 | 14.2 | 3.2 | 3.2 | 8.5 | 9.5 | 1.6 | 1.6 | 4.2 | 4.7 |
| Blood/Erythrocyte | Vitamin B2 status (gluthation reductase activation) | 5.2 | 40 | 3.9 | 15.1 | 21.6 | 22.8 | 2.6 | 10.1 | 14.4 | 15.2 | 1.3 | 5.0 | 7.2 | 7.6 |
| Blood/Erythrocyte | Vitamin B12 | 15 | 69 | 11.3 | 26.5 | 45.0 | 48.5 | 7.5 | 17.7 | 30.0 | 32.4 | 3.8 | 8.8 | 15.0 | 16.2 |
| Blood/Erythrocyte | Vitamin B6 | 14 | 24 | 10.5 | 10.4 | 27.7 | 31.0 | 7.0 | 6.9 | 18.5 | 20.7 | 3.5 | 3.5 | 9.2 | 10.3 |
| Blood | Vitamin B6 | 20 | 34 | 15.0 | 14.8 | 39.5 | 44.2 | 10.0 | 9.9 | 26.4 | 29.5 | 5.0 | 4.9 | 13.2 | 14.7 |
| Blood/Erythrocyte | Vitamin E (Tocopherol) | 7.6 | 21 | 5.7 | 8.4 | 17.8 | 19.5 | 3.8 | 5.6 | 11.9 | 13.0 | 1.9 | 2.8 | 5.9 | 6.5 |
| Blood/Erythrocyte | Vitamin K (Phylloquinone) | 38 | 44 | 28.5 | 21.8 | 68.8 | 77.7 | 19.0 | 14.5 | 45.9 | 51.8 | 9.5 | 7.3 | 22.9 | 25.9 |

Biological Variation Goals

| Sample Type | Analyte / Test | %CV _i | %CV _g | Minimum Specification | | | | Desirable Specification | | | | Optimal Specification | | | |
|-------------|-----------------------|------------------|------------------|-----------------------|-------|----------------|----------------|-------------------------|-------|----------------|----------------|-----------------------|-------|----------------|----------------|
| | | | | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% | %CV | %Bias | %TEa CI-90% | %TEa CI-95% |
| Serum | VLDL Cholesterol | 27.6 | --- | 20.7 | 12.9 | 47.1 | 53.5 | 13.8 | | 22.8 | 27.0 | 6.9 | | 11.4 | 13.5 |
| Plasma | Von Willebrand factor | 2.5 | 27.3 | 1.9 | 1.2 | 4.3 | 4.8 | 1.3 | 6.9 | 8.9 | 9.3 | 0.6 | 3.4 | 4.5 | 4.7 |
| Serum | Water | 3.1 | 0.1 | 2.3 | 1.5 | 5.3 | 6.0 | 1.6 | 0.8 | 3.3 | 3.8 | 0.8 | 0.4 | 1.7 | 1.9 |
| Serum | Zeaxanthine | 34.7 | --- | 26.0 | 16.3 | 59.2 | 67.3 | 17.4 | | 28.6 | 34.0 | 8.7 | | 14.3 | 17.0 |
| Serum | Zinc | 9.3 | 9.4 | 7.0 | 4.4 | 15.9 | 18.0 | 4.7 | 3.3 | 11.0 | 12.4 | 2.3 | 1.7 | 5.5 | 6.2 |
| Plasma | Zinc | 11 | 14 | 8.3 | 5.2 | 18.8 | 21.3 | 5.5 | 4.5 | 13.5 | 15.2 | 2.8 | 2.2 | 6.8 | 7.6 |