**Supplementary file 3**

**Table S1:** Descriptive statistics of AMP subsets calculated using Pandas package.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Physicochemical****Parameters** | **Mean** | **Std.** | **Min** | **Q1** | **Median, Q2** | **Q3** | **Max** |
| **SUBSET 1-10** |  |
| Length | 7.94 | 1.91 | 2 | 6 | 8 | 10 | 10 |
| Charge | 0.66 | 2.23 | -7 | 0 | 1 | 2 | 6 |
| Hydrophobicity | 43.11 | 21.58 | 0 | 25 | 50 | 60 | 87 |
| Boman index | 0.60 | 2.49 | -3.31 | -1.22 | 0.03 | 2.24 | 8.72 |
| MW | 892.13 | 227.29 | 294.35 | 728.13 | 926.03 | 1083.21 | 1385.66 |
| pI | 7.87 | 2.77 | 2.42 | 6 | 7.70 | 10.02 | 12.41 |
| Instability index | 26.69 | 46.83 | -43.43 | -1.20 | 11.38 | 45.96 | 190.38 |
| Aromaticity | 0.12 | 0.13 | 0 | 0 | 0.11 | 0.18 | 0.50 |
| Aliphatic Index | 98.23 | 74.73 | 0 | 34.50 | 88 | 168.61 | 256.25 |
| **SUBSET 11-20** |  |
| Length | 16.04 | 2.75 | 11 | 13 | 16 | 19 | 20 |
| Charge | 2.47 | 1.84 | -3 | 1 | 2 | 3 | 9 |
| Hydrophobicity | 51.49 | 14.58 | 0 | 43 | 55 | 61 | 93 |
| Boman index | -0.00 | 1.76 | -3.35 | -1.30 | -0.50 | 1.14 | 5.78 |
| MW | 1782.20 | 356.45 | 976.05 | 1479.32 | 1784.03 | 2021.94 | 5327.99 |
| pI | 9.58 | 1.97 | 2.75 | 9.54 | 10.02 | 10.70 | 12.79 |
| Instability index | 23.69 | 27.73 | -36.22 | 3.67 | 19.26 | 38.36 | 126.40 |
| Aromaticity | 0.10 | 0.07 | 0 | 0.05 | 0.10 | 0.15 | 0.38 |
| Aliphatic Index | 121.73 | 57.10 | 0 | 72.55 | 134.61 | 165.38 | 240 |
| **SUBSET 21-30** |  |
| Length | 24.98 | 2.76 | 21 | 23 | 24 | 27 | 30 |
| Charge | 3.51 | 2.27 | -5 | 2 | 3 | 4 | 13 |
| Hydrophobicity | 47.22 | 10.76 | 0 | 41 | 48 | 54 | 71 |
| Boman index | 0.46 | 1.31 | -2.34 | -0.43 | 0.25 | 1.08 | 5.91 |
| MW | 2704.17 | 382.37 | 1762.07 | 2476.45 | 2638.28 | 2976.31 | 5041.55 |
| pI | 9.93 | 1.63 | 2.65 | 9.63 | 10.26 | 10.88 | 12.88 |
| Instability index | 21.58 | 25.78 | -23.68 | 2.89 | 16.58 | 35.29 | 165.29 |
| Aromaticity | 0.07 | 0.05 | 0 | 0.03 | 0.08 | 0.12 | 0.26 |
| Aliphatic Index | 99.70 | 36.34 | 0 | 76.45 | 105.83 | 126.25 | 190 |
| **SUBSET 31-40** |  |
| Length | 35.27 | 2.85 | 31 | 33 | 35 | 38 | 40 |
| Charge | 4.85 | 3.04 | -6 | 3 | 4 | 7 | 16 |
| Hydrophobicity | 40.38 | 8.43 | 0 | 36 | 42 | 46 | 61 |
| Boman index | 1.47 | 1.20 | -1.57 | 0.53 | 1.31 | 2.22 | 6.68 |
| MW | 3848.58 | 402.99 | 3007.54 | 3468.07 | 3877.43 | 4172.73 | 4911.69 |
| pI | 9.76 | 1.64 | 2.75 | 8.72 | 10.06 | 10.88 | 13.06 |
| Instability index | 31.77 | 27.08 | -19.51 | 13.61 | 26.62 | 46.39 | 166.16 |
| Aromaticity | 0.07 | 0.05 | 0 | 0.03 | 0.06 | 0.10 | 0.24 |
| Aliphatic Index | 77.04 | 30.13 | 0 | 54.44 | 81.61 | 100.30 | 176.12 |
| **SUBSET 41-50** |  |
| Length | 44.64 | 2.55 | 41 | 43 | 44 | 46 | 50 |
| Charge | 4.45 | 3.44 | -5 | 2 | 4 | 6 | 20 |
| Hydrophobicity | 38.26 | 7.35 | 10 | 34 | 38 | 43 | 59 |
| **Physiochemical****Parameter** | **Mean** | **Std.** | **Min** | **25%** | **50%** | **75%** | **Max** |
| Boman index | 1.45 | 0.94 | -0.96 | 0.77 | 1.28 | 2.04 | 4.03 |
| MW | 4870.14 | 414.60 | 3142.17 | 4601.22 | 4833.71 | 5165.04 | 5988.88 |
| pI | 9.14 | 1.75 | 4.09 | 8.11 | 9.17 | 10.39 | 13.10 |
| Instability index | 31.36 | 27.39 | -23.82 | 10.99 | 27.25 | 46.13 | 135.06 |
| Aromaticity | 0.08 | 0.04 | 0 | 0.04 | 0.08 | 0.11 | 0.22 |
| Aliphatic Index | 65.96 | 27.18 | 9.51 | 44.56 | 63.87 | 86.27 | 168.40 |
| **SUBSET 51-60** |  |
| Length | 54.96 | 3.25 | 51 | 52 | 55 | 58 | 60 |
| Charge | 5.56 | 5.17 | -12 | 2.75 | 6 | 7 | 23 |
| Hydrophobicity | 36.96 | 12.36 | 5 | 29.75 | 36.50 | 45.25 | 62 |
| Boman index | 1.57 | 1.30 | -0.91 | 0.70 | 1.82 | 2.53 | 4.24 |
| MW | 5977.15 | 526.30 | 4850.29 | 5571.19 | 5992.95 | 6253.80 | 7480.05 |
| pI | 9.37 | 2.03 | 3.56 | 8.11 | 9.66 | 10.70 | 13.37 |
| Instability index | 39.14 | 25.28 | -14.70 | 21.93 | 37.93 | 52.37 | 134.91 |
| Aromaticity | 0.08 | 0.05 | 0 | 0.05 | 0.07 | 0.11 | 0.30 |
| Aliphatic Index | 64.88 | 31.33 | 0 | 44.32 | 62.27 | 81.73 | 144.66 |
| **SUBSET 61-70** |  |
| Length | 65.46 | 2.90 | 61 | 63 | 65.50 | 68 | 70 |
| Charge | 6.13 | 5.21 | -2 | 3 | 5 | 8 | 30 |
| Hydrophobicity | 38.70 | 12.31 | 4 | 31.25 | 38.50 | 48 | 62 |
| Boman index | 1.36 | 1.14 | -0.75 | 0.21 | 1.53 | 2.21 | 3.83 |
| MW | 7035.55 | 590.24 | 5443.89 | 6670.17 | 7078.81 | 7414.55 | 8090.41 |
| pI | 9.30 | 1.95 | 3.72 | 8.19 | 9.32 | 10.65 | 13.14 |
| Instability index | 33.78 | 17.87 | -2.28 | 20.10 | 34.62 | 46.45 | 71.56 |
| Aromaticity | 0.07 | 0.04 | 0 | 0.04 | 0.06 | 0.10 | 0.20 |
| **SUBSET 71-80** |  |  |  |  |  |  |  |
| Length | 75.55 | 2.63 | 71 | 74 | 76 | 77 | 80 |
| Charge | 4.79 | 4.97 | -11 | 2 | 6 | 8 | 14 |
| Hydrophobicity | 35.56 | 7.54 | 18 | 32 | 36 | 40 | 53 |
| Boman index | 1.79 | 0.89 | -0.40 | 1.32 | 1.92 | 2.26 | 4.05 |
| MW | 8392.55 | 547.69 | 6657.62 | 8164.66 | 8412.27 | 8699 | 9711.36 |
| pI | 8.81 | 2.14 | 3.77 | 7.81 | 9.29 | 10.37 | 12.79 |
| Instability index | 46.07 | 19.33 | 14.52 | 31.84 | 45.38 | 62.59 | 91.67 |
| Aromaticity | 0.07 | 0.04 | 0 | 0.04 | 0.06 | 0.09 | 0.20 |
| Aliphatic Index | 67.74 | 26.85 | 9.87 | 49.36 | 66.63 | 87.26 | 142.98 |
| **SUBSET 81-90** |  |
| Length | 85.73 | 3.30 | 81 | 82.25 | 87 | 88 | 90 |
| Charge | 1.76 | 5.78 | -8 | -2.75 | -0.50 | 6.75 | 12 |
| Hydrophobicity | 37.92 | 7.54 | 20 | 34.50 | 39 | 43.75 | 50 |
| Boman index | 1.62 | 0.77 | -0.23 | 1.19 | 1.61 | 2.09 | 3.20 |
| MW | 9384.11 | 543.42 | 8456.91 | 8964.76 | 9260.96 | 9839.26 | 10374.47 |
| pI | 7.09 | 2.12 | 4.03 | 5.07 | 6.63 | 8.73 | 10.77 |
| Instability index | 41.67 | 19.72 | -0.51 | 29.32 | 44.13 | 54.70 | 86.90 |
| Aromaticity | 0.06 | 0.03 | 0 | 0.04 | 0.07 | 0.08 | 0.13 |
| Aliphatic Index | 71.13 | 23.81 | 28.87 | 53.63 | 73.78 | 89.34 | 113.08 |
| **SUBSET 91-100** |  |
| **Physiochemical****Parameter** | **Mean** | **Std.** | **Min** | **25%** | **50%** | **75%** | **Max** |
| Length | 95.32 | 2.56 | 91 | 93 | 95 | 97 | 100 |
| Charge | 5.46 | 6.75 | -6 | 2 | 5 | 9 | 30 |
| Hydrophobicity | 35.21 | 6.29 | 19 | 32 | 36 | 39 | 44 |
| Boman index | 1.88 | 0.57 | 1.02 | 1.55 | 1.71 | 2.23 | 3.81 |
| MW | 10637.59 | 539.92 | 9365.60 | 10296.98 | 10723.60 | 11039.53 | 11731.06 |
| pI | 8.73 | 2.26 | 4.25 | 7.763 | 8.77 | 10.46 | 13.53 |
| Instability index | 41.24 | 16.82 | 15.52 | 29.50 | 36.19 | 47.31 | 93.79 |
| Aromaticity | 0.08 | 0.03 | 0 | 0.06 | 0.09 | 0.12 | 0.13 |
| Aliphatic Index | 67.51 | 17.60 | 37.75 | 52.11 | 67.24 | 79.10 | 95.60 |
| **SUBSET >100** |  |
| Length | 124.66 | 18.83 | 101 | 107.75 | 122 | 132 | 183 |
| Charge | 7.76 | 6.40 | -9 | 3 | 7 | 12 | 20 |
| Hydrophobicity | 30.98 | 8.06 | 7 | 28.75 | 32.50 | 35 | 45 |
| Boman index | 1.90 | 0.79 | -0.64 | 1.58 | 1.94 | 2.39 | 3.39 |
| MW | 13455.58 | 2422.28 | 8816.05 | 11645.25 | 13601.88 | 14664.69 | 19842.55 |
| pI | 8.87 | 1.80 | 4.35 | 7.65 | 9.04 | 10.29 | 11.66 |
| Instability index | 42.28 | 15.31 | 8.74 | 31.54 | 41.57 | 54.74 | 82.71 |
| Aromaticity | 0.08 | 0.03 | 0.01 | 0.06 | 0.08 | 0.10 | 0.16 |
| Aliphatic Index | 58.82 | 18.08 | 23.23 | 47.29 | 59.19 | 69.62 | 100.99 |

Std. = Standard deviation; Min = Minimum; Q1 = First quartile or 25%; Q2 = Second quartile or 50%; Q3 = Third quartile or 75%; Max = Maximum

**Table S2:** Descriptive statistics of ACP subsets calculated using Pandas package.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Physicochemical****Parameters** | **Mean** | **Std.** | **Min** | **Q1** | **Median, Q2** | **Q3** | **Max** |
| **SUBSET 1-10** |  |
| Length | 7.25 | 1.76 | 5 | 5.75 | 7 | 9 | 10 |
| Charge | -1.16 | 1.94 | -5 | -3 | -1 | 0.25 | 1 |
| Hydrophobicity | 51.66 | 26.73 | 0 | 32.25 | 57.50 | 71 | 100 |
| Boman index | 0.77 | 3.16 | -3.82 | -1.17 | 0.09 | 1.70 | 8.33 |
| MW | 796.65 | 219.03 | 407.44 | 687.30 | 813.98 | 895.50 | 1157.25 |
| pI | 5.51 | 3.03 | 2.55 | 2.84 | 4.53 | 6.68 | 10.74 |
| Instability index | 10.39 | 37.57 | -30.86 | -13.30 | -2 | 27.27 | 95.88 |
| Aromaticity | 0.04 | 0.07 | 0 | 0 | 0 | 0.02 | 0.22 |
| Aliphatic Index | 125.62 | 104.55 | 0 | 48.93 | 82.33 | 261.07 | 264.28 |
| **SUBSET 11-20** |  |
| Length | 15.83 | 2.46 | 11 | 14 | 16 | 17 | 20 |
| Charge | 2.81 | 1.76 | -1 | 2 | 2 | 4 | 8 |
| Hydrophobicity | 54.30 | 10.65 | 15 | 50 | 56 | 58 | 75 |
| Boman index | -0.37 | 1.31 | -2.55 | -1.15 | -0.59 | 0.11 | 4.39 |
| MW | 1717.80 | 285.53 | 1128.16 | 1521.35 | 1632.82 | 1894.81 | 2301.70 |
| pI | 9.90 | 1.52 | 3.15 | 9.83 | 10.02 | 10.86 | 11.87 |
| Instability index | 16.39 | 25.19 | -31.77 | -5.74 | 14.61 | 31.89 | 96.95 |
| Aromaticity | 0.09 | 0.07 | 0 | 0.05 | 0.07 | 0.12 | 0.30 |
| Aliphatic Index | 139.99 | 47.55 | 29.50 | 128.05 | 150 | 163.35 | 227.50 |
| **SUBSET 21-30** |  |
| **Physiochemical****Parameter** | **Mean** | **Std.** | **Min** | **25%** | **50%** | **75%** | **Max** |
| Length | 26.33 | 2.85 | 21 | 24 | 27 | 29 | 30 |
| Charge | 2.92 | 2.64 | -1 | 1 | 3 | 4 | 11 |
| Hydrophobicity | 47.97 | 9.31 | 22 | 41 | 48 | 54 | 68 |
| Boman index | 0.38 | 1.27 | -1.77 | -0.56 | 0.37 | 0.88 | 5.58 |
| MW | 2835.10 | 339.19 | 2071.47 | 2552.03 | 2884.35 | 3099.18 | 3638.50 |
| pI | 9 | 2.36 | 3.94 | 7.43 | 9.69 | 10.69 | 12.80 |
| Instability index | 29.84 | 27.66 | -12.54 | 13.22 | 25.80 | 42.33 | 141.26 |
| Aromaticity | 0.07 | 0.05 | 0 | 0.03 | 0.06 | 0.12 | 0.23 |
| Aliphatic Index | 97.29 | 41.48 | 15.60 | 63.31 | 101.07 | 129.31 | 178.80 |
| **SUBSET 31-40** |  |
| Length | 33.41 | 2.55 | 31 | 31 | 33 | 35 | 39 |
| Charge | 3.61 | 3.38 | -1 | 1 | 3 | 5 | 15 |
| Hydrophobicity | 44 | 7 | 20 | 41 | 45 | 48 | 54 |
| Boman index | 0.74 | 0.92 | -0.35 | 0.05 | 0.43 | 1.19 | 3.04 |
| MW | 3583.37 | 430.24 | 3164.77 | 3256.90 | 3364.93 | 3869.86 | 4720.64 |
| pI | 9.02 | 2.09 | 4.17 | 7.43 | 8.63 | 10.91 | 12.70 |
| Instability index | 28.16 | 22.15 | 2.24 | 16.66 | 24.12 | 33.98 | 118.67 |
| Aromaticity | 0.06 | 0.03 | 0 | 0.05 | 0.06 | 0.08 | 0.15 |
| Aliphatic Index | 84.77 | 21.64 | 25.88 | 75.55 | 86.29 | 97.55 | 117.87 |
| **SUBSET 41-50** |  |
| Length | 45.73 | 2.10 | 41 | 45 | 46 | 46 | 50 |
| Charge | 5.94 | 3.90 | -6 | 5 | 6 | 7 | 12 |
| Hydrophobicity | 32.10 | 4.56 | 20 | 30 | 30 | 36 | 38 |
| Boman index | 2.39 | 0.57 | 1.62 | 2.18 | 2.32 | 2.49 | 4.13 |
| MW | 5081.09 | 296.81 | 4442.12 | 4896.69 | 5028.34 | 5296.24 | 5743.68 |
| pI | 9.04 | 1.61 | 4.09 | 8.63 | 9.08 | 9.63 | 11.44 |
| Instability index | 55.31 | 18.28 | 32.47 | 44.25 | 49.06 | 63.54 | 93.54 |
| Aromaticity | 0.06 | 0.02 | 0.02 | 0.04 | 0.06 | 0.06 | 0.12 |
| Aliphatic Index | 49.21 | 15.80 | 18.57 | 42.06 | 46.73 | 52.79 | 97.60 |
| **SUBSET >50** |  |
| Length | 83 | 18 | 53 | 76 | 84 | 90 | 111 |
| Charge | 4.85 | 6.89 | -4 | 0.50 | 4 | 8.50 | 16 |
| Hydrophobicity | 34.14 | 5.42 | 27 | 30.50 | 35 | 37 | 42 |
| Boman index | 2.11 | 1.01 | 0.28 | 1.71 | 2.44 | 2.57 | 3.50 |
| MW | 9095.16 | 1958.69 | 6068 | 8293.24 | 8834.63 | 9962.94 | 12251.12 |
| pI | 8.21 | 2.66 | 3.35 | 7.29 | 8 | 10.20 | 11.12 |
| Instability index | 34.21 | 13.39 | 16.77 | 23.12 | 36 | 45.47 | 49.49 |
| Aromaticity | 0.06 | 0.03 | 0.01 | 0.04 | 0.05 | 0.08 | 0.11 |
| Aliphatic Index | 67.08 | 16.73 | 50.41 | 56.69 | 62.45 | 72.94 | 97.43 |

Std. = Standard deviation; Min = Minimum; Q1 = First quartile or 25%; Q2 = Second quartile or 50%; Q3 = Third quartile or 75%; Max = Maximum