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| **Table S3. Phosphorus substrate absorbance unitsa of stromatolitic microbial mats.** |
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| **Phosphorus Substrate (n = 59)** | **Type 1 Matb ± SEM** | **Type 3 Matb ± SEM** | **P-value** |
| Phosphate | 298.3 ± 21.5 | 330.3 ± 7.2 | 0.14 |
| Pyrophosphate | 271.0 ± 21.7 | 337.3 ± 0.9 | 0.05 |
| Trimetaphosphate | 252.7 ± 40.4 | 333.3 ± 1.3 | 0.09 |
| Tripolyphosphate | 274.7 ± 38.7 | 337.0 ± 2.5 | 0.12 |
| Triethyl Phosphate | 33.0 ± 16.1 | 79.3 ± 12.6 | 0.05 |
| Hypophosphite | 98.7 ± 71.2 | 55.0 ± 3.5 | 0.30 |
| Adenosine 2'-Monophosphate | 338.7 ± 8.3 | 329.0 ± 6.2 | 0.20 |
| Adenosine 3'-Monophosphate | 256.3 ± 31.3 | 334.3 ± 1.2 | 0.07 |
| Adenosine 5'-Monophosphate | 299.7 ± 4.6 | 332.0 ± 2.0 | 0.01 |
| Adenosine 2',3'-Cyclic Monophosphate | 335.3 ± 11.7 | 338.3 ± 0.3 | 0.41 |
| Adenosine 3',5'-Cyclic Monophosphate | 202.7 ± 77.1 | 325.3 ± 7.2 | 0.13 |
| Thiophosphate | 178.3 ± 72.4 | 307.3 ± 3.8 | 0.11 |
| Dithiophosphate | 274.0 ± 44.5 | 328.3 ± 8.8 | 0.17 |
| D,L-a-Glycerol Phosphate | 270.3 ± 69.9 | 323.3 ± 1.9 | 0.26 |
| b-Glycerol Phosphate | 221.7 ± 2.2 | 332.0 ± 1.7 | 0.00 |
| Carbamyl Phosphate | 174.7 ± 85.2 | 251.0 ± 3.5 | 0.23 |
| D-2-Phospho-Glyceric Acid | 290.0 ± 35.6 | 319.3 ± 2.4 | 0.25 |
| D-3-Phospho-Glyceric Acid | 201.7 ± 16.4 | 311.7 ± 2.3 | 0.01 |
| Guanosine 2'-Monophosphate | 281.3 ± 8.7 | 333.0 ± 3.2 | 0.01 |
| Guanosine 3'-Monophosphate | 291.7 ± 7.6 | 335.7 ± 9.1 | 0.01 |
| Guanosine 5'-Monophosphate | 256.7 ± 33.8 | 321.7 ± 4.9 | 0.10 |
| Guanosine 2',3'-Cyclic Monophosphate | 310.3 ± 4.7 | 322.0 ± 11.5 | 0.21 |
| Guanosine 3',5'-Cyclic Monophosphate | 187.0 ± 64.2 | 295.7 ± 6.4 | 0.12 |
| Phosphoenol Pyruvate | 199.3 ± 25.3 | 308.0 ± 2.6 | 0.02 |
| Phospho-Glycolic Acid | 174.0 ± 67.5 | 298.3 ± 10.1 | 0.10 |
| D-Glucose-1-Phosphate | 314.0 ± 5.5 | 337.3 ± 5.5 | 0.02 |
| D-Glucose-6-Phosphate | 264.3 ± 47.0 | 340.7 ± 0.7 | 0.12 |
| 2-Deoxy-D-Glucose 6-Phosphate | 221.0 ± 21.2 | 302.3 ± 0.9 | 0.03 |
| D-Glucosamine-6-Phosphate | 223.7 ± 8.8 | 328.3 ± 0.9 | 0.00 |
| 6-Phospho-Gluconic Acid | 272.7 ± 30.3 | 315.3 ± 0.9 | 0.15 |
| Cytidine 2'-Monophosphate | 250.3 ± 14.1 | 253.3 ± 8.7 | 0.43 |
| Cytidine 3'-Monophosphate | 202.0 ± 27.2 | 283.3 ± 11.7 | 0.04 |
| Cytidine 5'-Monophosphate | 279.3 ± 19.8 | 313.0 ± 8.5 | 0.11 |
| Cytidine 2',3'-Cyclic Monophosphate | 266.7 ± 10.7 | 323.0 ± 7.5 | 0.01 |
| Cytidine 3',5'-Cyclic Monophosphate | 216.0 ± 65.6 | 294.7 ± 3.7 | 0.18 |
| D-Mannose-1-Phosphate | 296.3 ± 4.7 | 316.3 ± 1.3 | 0.02 |
| D-Mannose-6-Phosphate | 280.3 ± 7.2 | 318.0 ± 6.4 | 0.01 |
| Cysteamine-S-Phosphate | 313.0 ± 20.0 | 349.3 ± 0.3 | 0.11 |
| Phospho-L-Arginine | 203.0 ± 15.7 | 333.3 ± 1.9 | 0.01 |
| O-Phospho-D-Serine | 246.7 ± 29.2 | 275.7 ± 4.1 | 0.21 |
| O-Phospho-L-Serine | 194.0 ± 14.2 | 328.0 ± 1.0 | 0.00 |
| O-Phospho-L-Threonine | 254.0 ± 89.2 | 308.0 ± 2.1 | 0.30 |
| Uridine 2'-Monophosphate | 183.3 ± 51.1 | 328.7 ± 0.9 | 0.05 |
| Uridine 3'-Monophosphate | 231.3 ± 35.3 | 324.3 ± 3.7 | 0.06 |
| Uridine 5'-Monophosphate | 214.7 ± 52.8 | 318.7 ± 5.2 | 0.09 |
| Uridine 2',3'-Cyclic Monophosphate | 207.3 ± 48.2 | 316.7 ± 2.7 | 0.07 |
| Uridine 3',5'-Cyclic Monophosphate | 148.3 ± 41.8 | 298.0 ± 4.2 | 0.03 |
| O-Phospho-D-Tyrosine | 239.7 ± 22.5 | 315.0 ± 5.0 | 0.04 |
| O-Phospho-L-Tyrosine | 307.7 ± 22.5 | 332.3 ± 5.5 | 0.19 |
| Phosphocreatine | 291.3 ± 17.8 | 318.7 ± 0.9 | 0.13 |
| Phosphoryl Choline | 241.7 ± 47.7 | 312.0 ± 3.6 | 0.14 |
| O-Phosphoryl-Ethanolamine  | 208.0 ± 65.1 | 319.7 ± 2.7 | 0.11 |
| Phosphono Acetic Acid | 148.7 ± 76.0 | 203.3 ± 1.8 | 0.27 |
| 2-Aminoethyl Phosphonic Acid | 144.7 ± 79.0 | 221.3 ± 4.3 | 0.22 |
| Methylene Diphosphonic Acid | 40.0 ± 113.0 | 12.3 ± 1.9 | 0.08 |
| Thymidine 3'-Monophosphate | 232.3 ± 35.1 | 298.3 ± 2.2 | 0.10 |
| Thymidine 5'-Monophosphate | 203.7 ± 41.7 | 289.7 ± 8.1 | 0.09 |
| Inositol Hexaphosphate | 175.0 ± 53.6 | 121.7 ± 15.6 | 0.21 |
| Thymidine 3',5'-Cyclic Monophosphate | 133.3 ± 41.2 | 293.7 ± 6.9 | 0.03 |
| asubstrates were considered utilized if absorbance readings were above threshold of 50 units |
| bvalues represent mean absorbance unit for three replicate phenotypic microarrays |