



Table 1. The top 14 most abundant metabolites that comprise 80% of the E. coli metabolome.

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| --- | --- | --- | --- |
| Metabolite | Conc. (mM) | K’D (mM) | Chelation stength |
| ATP | 9.63 | 0.28 (±0.01) | Strong |
| UTP | 8.29 | 0.238 (±0.004) | Strong |
| GTP | 4.87 | 0.200 (±0.008) | Strong |
| dTTP | 4.62 | 0.163 (±0.003) | Strong |
| L-Glutamic acid | 96 |  | Weak |
| Glutathione | 16.6 |  | Weak |
| Fructose 1,6-BP | 15.2 | 5.8 (±0.1) | Weak |
| UDP-GlcNAC | 9.24 |  | Weak |
| Glucose 6-P | 7.88 | 17.0 (±0.2) | Weak |
| L-Aspartic acid | 4.23 |  | Weak |
| L-Valine | 4.02 |  | Weak |
| L-Glutamine | 3.81 |  | Weak |
| 6-P-gluconic acid | 3.77 | 14.3 (±0.2) | Weak |
| Pyruvic acid | 3.66 |  | Weak |
| Dihydroxyacetone phosphate |  |  |  |

aDetermined at 37 °C with Isothermal titration calorimetry. Error is the propagated standard error in the fit parameter.

bDetermined by correcting absolute binding constants from the liturature for pH and ionic strength.

cmetabolites with KDs for Mg2+ less than 2 mM are considered strong Mg2+ chelators.

Table 2. RNA helices tested in this study.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Helix | Sequence (5'-FAM/ BHQ1-3') | AU  content | Condition | dH (kcal/mol) | dS (cal/mol/K) | dG (kcal/mol) | ddH (kcal/mol) | ddS (cal/mol/K) | ddG (kcal/mol) |
| F | CGCAUCCU/AGGAUGCG | 0.38 | 2 mM free |  |  |  |  |  |  |
| NTPCM |  |  |  |  |  |  |
| WMCM |  |  |  |  |  |  |
| Ecoli80 |  |  |  |  |  |  |
| G | CCAUAUCA/UGAUAUGG | 0.63 | 2 mM free |  |  |  |  |  |  |
| NTPCM |  |  |  |  |  |  |
| WMCM |  |  |  |  |  |  |
| Ecoli80 |  |  |  |  |  |  |
| H | CCAUAUUA/UAAUAUGG | 0.75 | 2 mM free |  |  |  |  |  |  |
| NTPCM |  |  |  |  |  |  |
| WMCM |  |  |  |  |  |  |
| Ecoli80 |  |  |  |  |  |  |
| I | CGGAUGGC/GCCAUCCG | 0.25 | 2 mM free |  |  |  |  |  |  |
| NTPCM |  |  |  |  |  |  |
| WMCM |  |  |  |  |  |  |
| Ecoli80 |  |  |  |  |  |  |
| J | CGUAUGUA/UACAUACG | 0.63 | 2 mM free |  |  |  |  |  |  |
| NTPCM |  |  |  |  |  |  |
| WMCM |  |  |  |  |  |  |
| Ecoli80 |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Helix | Sequence (5'-FAM/BHQ1-3') | Length | AU  content |
| F | CGCAUCCU/AGGAUGCG | 8 | 0.38 |
| G | CCAUAUCA/UGAUAUGG | 8 | 0.63 |
| H | CCAUAUUA/UAAUAUGG | 8 | 0.75 |
| I | CGGAUGGC/GCCAUCCG | 8 | 0.25 |
| J | CGUAUGUA/UACAUACG | 8 | 0.63 |