

**Table S1.** Detailed composition of the final EPS soup.

<b>Chemical Name</b>	<b>Vendor</b>	<b>CAS #</b>	<b>Concentration (mM)</b>
<b>1,3-dihydroxyacetone</b>	Fisher Scientific	96-26-4	0.32
<b>2-aminobutyric acid</b>	Acros Organics	2835-81-6	0.08
<b>acetoguanamine</b>	VWR	541-02-9	0.16
<b>adenine</b>	Fisher Scientific	73-24-5	0.32
<b>adenosine triphosphate</b>	Sigma-Aldrich	34369-07-8	0.32
<b>ammonium chloride</b>	Sigma-Aldrich	12125-02-9	20
<b>ammonium persulfate</b>	IBI Scientific	7727-54-0	0.04
<b>β-alanine</b>	Tokyo Chemical	107-95-9	0.32
<b>butyric acid (sodium salt)</b>	Fisher Scientific	156-54-7	0.08
<b>cobalt(II) chloride anhydrous</b>	BTC Chemicals	7646-79-9	10 <sup>-5</sup>
<b>copper(II) chloride dihydrate</b>	Alfa Aesar	10125-13-0	10 <sup>-5</sup>
<b>cytosine</b>	Fisher Scientific	71-30-7	0.32
<b>D-(-)-ribose</b>	Fisher Scientific	50-69-1	0.16
<b>D-(+)-xylose</b>	Fisher Scientific	58-86-6	0.16
<b>D-(+)-glucose</b>	DOT Scientific Inc.	50-99-7	0.16
<b>DL-arabinose</b>	VWR	147-81-9	0.16
<b>formic acid 90%</b>	Aqua Solutions	64-18-6	0.64
<b>glycerol</b>	DOT Scientific Inc.	56-81-5	0.32
<b>glycolic acid</b>	Acros Organics	79-14-1	0.32
<b>hydroxybutyric acid</b>	Sigma-Aldrich	150-83-4	0.08
<b>iminodiacetic acid</b>	VWR	142-73-4	0.16
<b>L-alanine</b>	VWR	56-41-7	0.32
<b>L-arginine</b>	Sigma-Aldrich	74-79-3	0.16
<b>L-ascorbic acid</b>	DOT Scientific Inc.	50-81-7	0.04
<b>L-asparagine</b>	Acros Organics	5794-13-8	0.16
<b>L-aspartic acid</b>	Alfa Aesar	56-84-8	0.32
<b>L-cysteine</b>	DOT Scientific Inc.	52-90-4	0.16
<b>L-glutamic Acid</b>	VWR	56-86-0	0.32
<b>L-glutamine</b>	Sigma-Aldrich	56-85-9	0.16
<b>L-glycine</b>	Sigma-Aldrich	54-40-6	0.32
<b>L-histidine</b>	DOT Scientific Inc.	71-00-1	0.08
<b>L-isoleucine</b>	DOT Scientific Inc.	73-32-5	0.16
<b>L-leucine</b>	DOT Scientific Inc.	61-90-5	0.32
<b>L-lysine</b>	DOT Scientific Inc.	657-27-2	0.32
<b>L-methionine</b>	DOT Scientific Inc.	63-68-3	0.08
<b>L-phenylalanine</b>	DOT Scientific Inc.	63-91-2	0.16

<b>L-proline</b>	Alfa Aesar	147-85-3	0.16
<b>L-serine</b>	DOT Scientific Inc.	56-45-1	0.32
<b>L-threonine</b>	DOT Scientific Inc.	72-19-5	0.32
<b>L-tryptophan</b>	DOT Scientific Inc.	73-22-3	0.08
<b>L-tyrosine</b>	Amresco	60-18-4	0.16
<b>L-valine</b>	DOT Scientific Inc.	72-18-4	0.32
<b>lactic acid 88% solution</b>	Fisher Scientific	50-21-5	0.16
<b>magnesium chloride</b>	DOT Scientific Inc.	7791-18-6	50
<b>N-ethanolamine</b>	Sigma-Aldrich	141-43-5	0.08
<b>N-methylalanine</b>	Sigma-Aldrich	3913-67-5	0.08
<b>N-methylglycine</b>	Acros Organics	107-97-1	0.16
<b>N-methylurea</b>	Fisher Scientific	759-73-9	0.08
<b>nickel(II) chloride hexahydrate</b>	Chem-IMPEX Int'l	7791-20-0	$4 \times 10^{-4}$
<b>nicotinamide</b>	DOT Scientific Inc.	98-92-0	0.08
<b>potassium chloride</b>	VWR	7447-40-7	10
<b>propionic acid</b>	Fisher Scientific	79-09-4	0.16
<b>pyruvic acid</b>	Fisher Scientific	127-17-3	0.08
<b>R-pantetheine</b>	Sigma-Aldrich	496-65-1	0.04
<b>sodium bisulfite</b>	Ward's	7631-90-5	0.08
<b>sodium chloride</b>	Fisher Scientific	7647-14-5	500
<b>sodium molybdate</b>	Strem Chemicals	10102-40-6	$10^{-5}$
<b>sodium nitrate</b>	Sigma-Aldrich	7631-99-4	20
<b>succinic acid</b>	Sigma-Aldrich	110-15-6	0.08
<b>succinonitrile</b>	VWR	110-61-2	0.16
<b>thymine</b>	Fisher Scientific	65-71-4	0.32
<b>uracil</b>	VWR	66-22-8	0.32
<b>urea</b>	IBI Scientific	57-13-6	0.16
<b>zinc(II) chloride</b>	Sigma-Aldrich	7646-85-7	$1.5 \times 10^{-5}$