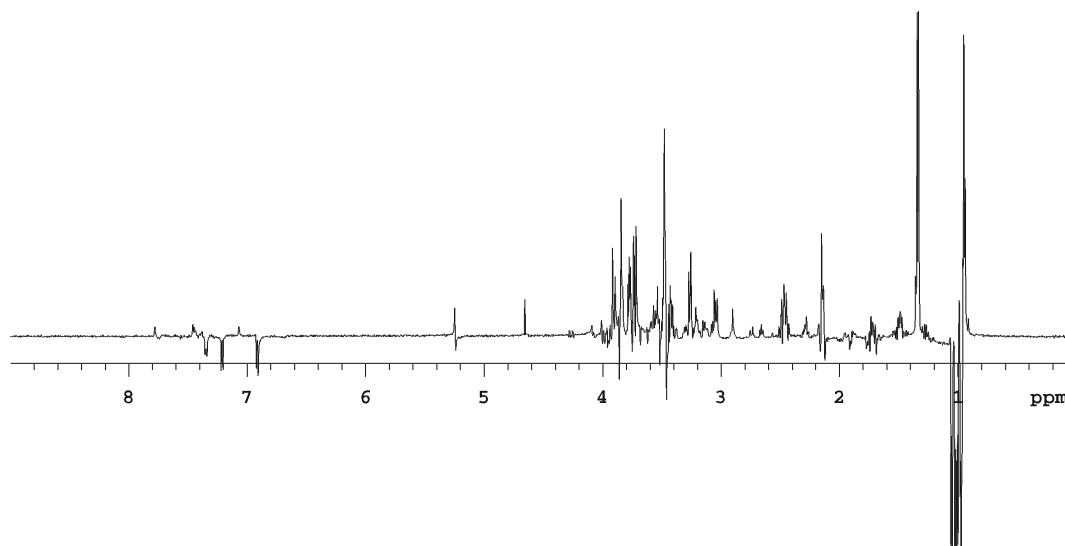


SUPPLEMENTARY MATERIAL

Resonance assignments of the medium are shown in (Supplementary Fig. 1), and also mentioned in the footnotes. The final assignments of resonances from the medium are summarized in Supplementary Table 1.



Supplementary Fig. (1). $^1\text{H-NMR}$ reference spectra of deuteriated medium. The spectrum was recorded for 10 min. Not all amino acids or vitamins from the medium are detectable by $^1\text{H-NMR}$. The most characteristic resonances are the negative multi resonances around 1 ppm of the methyl groups from the amino acids valine, leucine and isoleucine. The resonance intensity seen at $\delta=1.33$ ppm can only be due to threonine since there is no lactate in the medium. Other resonances from methionine appear at $\delta=2.14$ (methyl), 2.65 (methine). The resonance at $\delta=3.84$ ppm is partly overlapped by other resonances. Around 7 and 8 ppm the aromatic side chain of the amino acids histidine and tyrosine are present. Histidine shows two singlets at $\delta=7.05$ and 7.78 and tyrosine shows doublets at $\delta=6.88$ and 7.18. Glucose is clearly visible by a signal at $\delta=5.2$ ppm, a resonance which also will be seen when the spectra contains astrocytes.

Supplementary Table 1. Summary of the Resonances of the Medium

Compound	Concentration (mg/l)	Chemical Shift, ppm (Multiplicities)
Arginine (Arg)	84	1.68(m); 1.92@; 3.23(t); 3.78(t) ³
Choline	4 ²	3.20(s); 3.52(t); 4.07(t) ⁴
Cysteine (Cys)	48	3.05(dd); 3.08(dd); 3.98(dd) ³
Folic acids	4 ²	1.94; 2.08; 3.37; 4.36; 4.51; 6.67; 7.68; 8.68 ¹
Histidine (His)	42	3.20(dd); 3.25(dd); 4.00(dd); 7.05(s); 7.78(s) ³
Glycine (Gly)	30	3.57(s) ¹
Glutamine (Gln)	365	2.13@; 2.46@; 3.76(t) ⁴
Glucose	1189	(3.2 – 3.90)@; 4.77 (); 5.24(d) ⁴
Inositol	7.2	3.27(t); 3.53(dd); 3.61(t); 4.05(t) ⁵
Isoleucine (Ile)	105	0.93(t); 1.00(d); 1.25(m); 1.45(m); 1.96(m); 3.65(m) ³
Leucine (Leu)	105	0.94(d); 0.96(d); 1.69(m); 1.72(m); 3.69(t) ³
Lysine (Lys)	146	1.45(m); 1.69(m); 1.89(m); 3.01(t); 3.74(t) ³
Methionine (Met)	30	2.14(s); 2.65(t); 3.84(t) ⁴
Nicotinamide	4 ²	7.60(q); 8.25(d); 8.72(d); 8.94(s) ⁵
Pantothenate	4 ²	0.94; 2.42; 3.42; 3.45; 3.49; 3.99 ¹

(Supplementary Table 1). Contd.....

Compound	Concentration (mg/l)	Chemical Shift, ppm (Multiplicities)
Phenylalanine (Phe)	66	3.13(dd); 3.26(dd); 3.98(dd); 7.31(m); 7.40(m) ⁵
Pyridoxal	4 ²	4.70; 8.12 ¹
Riboflavine	0.4 ²	4.25; 4.60; 4.92; 7.85; 7.90; 11.35 ¹
Serine (Ser)	42	3.84(dd); 3.95(dd); 3.98(dd) ⁴
Thiamine	4 ²	2.54; 2.58; 3.08; 3.65; 5.67; 8.39; 10.00 ¹
Threonine (Thr)	95	1.32(d); 3.58(d); 4.25(m) ³
Tyrosine (Tyr)	72	3.05(dd); 3.15(dd); 3.93(dd); 6.88(d); 7.18(d) ³
Tryptophane (Trp)	16	3.31(dd); 3.48(dd); 4.05(dd); 7.20(t); 7.28(t); 7.31(s); 7.54(d); 7.73(d) ³
Valine (Val)	94	0.99(d); 1.05(d); 2.27(m); 3.61(d) ¹

Symbols: s, singlet; d, doublet; dd, doublet of doublets; t, triplet; q, quartet; m, multiplet; c, complex.

¹values from SDBS data base, http://www.aist.go.jp/RIODB/SDBS/cgi-bin/direct_frame_top.cgi?lang=engof.

²not detected in the spectrum because of too low concentration.

³values from Fan [37].

⁴measured in this investigation.

⁵values from Sze and Jardetzky [42].

⁶resonances visible only under acidic conditions.