Metabolic profiling of the three neural derived embryonal pediatric tumors retinoblastoma, neuroblastoma and medulloblastoma, identifies distinct metabolic profiles

SUPPLEMENTARY MATERIALS

Supplementary Table 1: Metabolite assignment, mean metabolite concentrations per tumor group, and significance values

| Identified metabolite | PPM assignment for quantification | Normalised mean concentration value | Kruskal-Wallis p-value for inter-tumour metabolite comparisons | Significant pairwise post-hoc comparisons (Mann-Whitney U test, \( p < 0.0017 \)) |
|-----------------------|----------------------------------|-----------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------|
|                       |                                  | RB | MB | NB |                                                | RB vs MB | RB vs NB | MB vs NB |
| 3-Hydroxybuturate (1) | 1.20 (d)                         | 0.015 | 0.002 | 0.012 | \( ^{*} p < 0.0001 \) | ↑ | ns | ↓ |
| Acetate (2)           | 1.92 (s)                         | 0.004 | 0.003 | 0.007 | ns, \( p < 0.002 \) | ns | ns | ns |
| Acetone (3)           | 2.22 (s)                         | 0.001 | 0.000 | 0.002 | ns, \( p < 0.101 \) | ns | ns | ns |
| Alanine (4)           | 1.48 (d)                         | 0.046 | 0.036 | 0.038 | ns, \( p < 0.002 \) | ns | ns | ns |
| Ascorbate (5)         | 4.52 (s)                         | 0.031 | 0.032 | 0.023 | ns, \( p < 0.002 \) | ns | ns | ns |
| Aspartate (6)         | 2.82 (dd)                        | 0.006 | 0.005 | 0.018 | \( ^{*} p < 0.0001 \) | ns | ↓ | ↓ |
| Beta-D-Glucose (7)    | 4.62 (d)                         | 0.003 | 0.002 | 0.006 | ns, \( p < 0.686 \) | ns | ns | ns |
| Choline (8)           | 3.20 (s)                         | 0.007 | 0.014 | 0.016 | \( ^{*} p < 0.0001 \) | ↓ | ↓ | ns |
| Creatine (9)          | 3.03 (s)                         | 0.049 | 0.068 | 0.031 | \( ^{*} p < 0.0001 \) | ns | ↑ | ↑ |
| GABA (10)             | 2.30 (i)                         | 0.012 | 0.003 | 0.000 | \( ^{*} p < 0.0001 \) | ↑ | ↑ | ns |
| Glutamate (11)        | 2.34 (m)                         | 0.058 | 0.055 | 0.130 | \( ^{*} p < 0.0001 \) | ns | ↓ | ↓ |
| Glutamine (12)        | 2.44 (m)                         | 0.057 | 0.067 | 0.028 | \( ^{*} p < 0.0001 \) | ns | ↑ | ↑ |
| Glutathione (13)      | 2.55 (m)                         | 0.020 | 0.019 | 0.019 | ns, \( p < 0.951 \) | ns | ns | ns |
| Glycerophosphocholine (14) | 3.23 (s)                       | 0.033 | 0.076 | 0.045 | ns, \( p < 0.260 \) | ns | ns | ns |
| Glycine (15)          | 3.55 (s)                         | 0.009 | 0.006 | 0.014 | \( ^{*} p < 0.0001 \) | ↓ | ns | ↑ |
| Hypotaurine (16)      | 2.65 (i)                         | 0.029 | 0.017 | 0.000 | \( ^{*} p < 0.0001 \) | ns | ↑ | ↑ |
| Isoleucine (17)       | 1.01 (d)                         | 0.003 | 0.002 | 0.003 | ns, \( p < 0.003 \) | ns | ns | ns |
| Lactate (18)          | 1.31 (d)                         | 0.364 | 0.230 | 0.262 | \( ^{*} p < 0.0001 \) | ↑ | ↑ | ↑ |
| Leucine (19)          | 0.95 (i)                         | 0.013 | 0.006 | 0.015 | ns, \( p < 0.01 \) | ns | ns | ns |
| Myoinositol (20)      | 3.52 (dd)                        | 0.010 | 0.086 | 0.149 | \( ^{*} p < 0.0001 \) | ↓ | ↓ | ↓ |
| NAA (21)              | 2.03 (s)                         | 0.004 | 0.011 | 0.018 | \( ^{*} p < 0.0001 \) | ↓ | ↓ | ns |
| Phosphocholine (22)   | 3.22 (s)                         | 0.029 | 0.098 | 0.049 | \( ^{*} p < 0.0001 \) | ↓ | ↓ | ↑ |
| Phosphoethanolamine (23) | 3.21 (s)                        | 0.014 | 0.015 | 0.029 | ns, \( p < 0.247 \) | ns | ns | ns |
| Scylloinositol (24)   | 3.34 (s)                         | 0.000 | 0.003 | 0.004 | \( ^{*} p < 0.0001 \) | ↓ | ↓ | ns |
| Serine (25)           | 3.84 (dd)                        | 0.004 | 0.005 | 0.005 | ns, \( p < 0.162 \) | ns | ns | ns |
| Succinate (26)        | 2.40 (s)                         | 0.004 | 0.002 | 0.003 | \( ^{*} p < 0.0001 \) | ↑ | ↑ | ns |
| Taurine (27)          | 3.42 (i)                         | 0.165 | 0.128 | 0.064 | \( ^{*} p < 0.0001 \) | ↑ | ↑ | ↑ |
| Valine (28)           | 1.07 (d)                         | 0.010 | 0.007 | 0.010 | ns, \( p < 0.002 \) | ns | ns | ns |
| Total Lipid           | Additional file 2 | 1.240 | 0.717 | 2.380 | \( ^{*} p < 0.002 \) | ns | ↓ | ↓ |

*Bonferroni corrected significance value of \( p < 0.0017 \) \( RB \) = retinoblastoma, \( MB \) = medulloblastoma, \( NB \) = neuroblastoma ns = not significantly different, Arrows indicate if the concentration is increased or decreased in the first tumor group relative to the second tumor group. Peak shape is described for each metabolite assigned at its respective PPM resonance: (s) metabolite is a singlet, (d) metabolite is a doublet, (dd) metabolite is a doublet of doublets, (t) metabolite is a triplet, (m) metabolite is a multiplet.
| Identified lipid group | Proton contribution | PPM assignment for quantification |
|------------------------|---------------------|----------------------------------|
| Lip 1                  | CH$_3$              | 0.90 ppm                         |
| Lip 2                  | CH$_2$)$_n$         | 1.29a,b ppm                      |
| Lip 3                  | CH$_2$-CH$_2$=O     | 1.59 ppm                         |
| Lip 4                  | CH$_2$-CH=          | 2.03 ppm                         |
| Lip 5                  | CH$_2$-CH$_2$-C=O   | 2.26 ppm                         |
| Lip 6                  | =CH-CH$_2$-CH=      | 2.80 ppm                         |
| Lip 7                  | -CH=CH-             | 5.30 ppm                         |