

**Table S1.** Baseline plasma concentrations (Relative Units) of metabolites of healthy controls and patients with breast cancer (BC).

	<b>Control</b> (n = 49)	<b>Baseline BC</b> (n = 52)	<b>p- Value</b>
2-Hydroxybutyric acid	3.5 (2.0-3.4)	4.3 (2.7-5.5)	<b>0.029</b>
2-Hydroxyisobutyric acid	1.2(0.9-1.3)	1.4 (1.0-1.6)	<b>0.008</b>
2-Hydroxyisovaleric acid	4.8 (3.2-5.2)	5.9 (3.6-6.5)	0.091
2-keto-3-methylvaleric acid	1.2 (0.9-1.5)	1.1 (0.8-1.3)	<b>0.038</b>
3-hydroxybutyric acid	13.1 (5.1-18.6)	16.5 (4.7-22.7)	0.841
3-Hydroxyisovaleric acid	0.9 (0.6-1.1)	1.0 (0.7-1.2)	0.545
3-methyl-2-oxobutyric acid	0.6 (0.4-0.7)	0.6 (0.4-0.7)	0.379
3-Phosphoglyceric acid	0.03 (0.02-0.04)	0.03 (0.04-0.1)	<b>3.3x10<sup>-10</sup></b>
4-Hydroxybenzoic acid	0.12 (0.12-0.13)	0.12 (0.11-0.13)	0.284
4-hydroxyPhenyllactic acid	0.2 (0.1-0.2)	0.2 (0.1-0.2)	0.101
4-Hydroxyproline	1.6 (1.1-1.9)	1.5 (1.0-1.9)	0.836
a-ketoglutaric acid	0.2 (0.1-0.2)	0.2 (0.1-0.2)	0.739
a-tocopherol	0.3 (0.1-0.4)	0.2 (0.1-0.3)	0.372
Alanine	21.1 (17.7-24.2)	24.6 (20.9-28.5)	<b>0.001</b>
Benzoic acid	0.5 (0.3-0.7)	0.6 (0.4-0.7)	0.074
Citric acid	17.5 (13.9-19.3)	22.2 (15.6-27.8)	<b>0.012</b>
d-Arabinose	0.02 (0.01-0.02)	0.03 (0.02-0.02)	0.107
d-Arabitol	0.008 (0.007-0.01)	0.01 (0.009-0.01)	<b>1.1x10<sup>-04</sup></b>
d -Fructose	0.02 (0.01-0.02)	0.02 (0.01-0.03)	<b>0.038</b>
d-Galactitol	0.02 (0.02-0.03)	0.02 (0.01-0.02)	<b>0.032</b>
d-Mannonic acid	0.02 (0.02-0.03)	0.04 (0.02-0.04)	<b>0.006</b>
d-Sucrose	0.003 (0.002-0.005)	0.007 (0.003-0.01)	<b>4.3x10<sup>-04</sup></b>
d-Threitol	0.02 (0.02-0.02)	0.04 (0.02-0.03)	<b>9.4x10<sup>-07</sup></b>
d-Xylitol	0.001 (0.0009-0.001)	0.001 (0.001-0.002)	0.201
d-Xylose	0.007 (0.005-0.01)	0.008 (0.006-0.01)	0.081
DL-2-Hydroxyglutaric.acid	0.04 (0.03-0.05)	0.05 (0.03-0.05)	0.519
Dodecanoic acid	0.7 (0.4-0.7)	0.9 (0.5-0.8)	0.105
Erythronic acid	0.02 (0.02-0.03)	0.03 (0.02-0.04)	<b>3.8x10<sup>-06</sup></b>
Ethanolamine	0.2 (0.2-0.3)	0.2 (0.1-0.3)	0.749
Ethylmalonic acid	5.6 (4.4-6.3)	2.4 (1.7-2.9)	<b>9.3x10<sup>-16</sup></b>
Fumaric acid	0.13 (0.11-0.14)	0.13 (0.1-0.2)	0.887
Galacturonic acid	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.525
Glucose-6-phosphate	0.005 (0.004-0.007)	0.01 (0.007-0.01)	<b>9.0x10<sup>-08</sup></b>
Glutamic acid	3.9 (3.1-4.4)	6.2 (3.6-7.5)	<b>1.1x10<sup>-04</sup></b>
Glutamine	37.3 (28.2-44.4)	33.9 (26.3-39.3)	0.167
Glyceric acid	07 (0.5-0.8)	0.6 (0.4-0.6)	<b>0.003</b>
Glycerol	1.7 (1.2-2.1)	0.8 (0.5-1.0)	<b>5.8x10<sup>-14</sup></b>
Glycerol-1-phosphate	0.2 (0.1-0.2)	0.2 (0.1-0.3)	<b>0.039</b>
Glycine	6.5 (5.9-7.0)	6.6 (6.1-7.2)	0.383
Glycolic acid	0.2 (0.1-0.2)	0.2 (0.1-0.2)	<b>1.6x10<sup>-06</sup></b>
Hippuric acid	0.4 (0.1-0.4)	0.3 (0.1-0.4)	0.285

Hydrocinnamic acid	0.09 (0.04-0.1)	0.07 (0.03-0.1)	0.295
Hypoxanthine	0.2 (0.1-0.3)	1.1 (0.3-1.5)	<b>7.7x10<sup>-11</sup></b>
Indole-3-propanoic acid	0.1 (0.1-0.2)	0.2 (0.1-0.2)	0.313
Indolelactic acid	0.1 (0.1-0.2)	0.2 (0.1-0.2)	0.143
Isoleucine	4.5 (3.9-5.1)	4.6 (3.7-5.2)	0.932
Lactic acid	55.2 (42.8-62.4)	64.1 (54.5-73.1)	<b>0.003</b>
Leucine	8.9 (8.1-9.8)	9.1 (7.7-10.5)	0.981
Linoleic acid	3.1 (1.5-3.9)	3.4 (1.6-4.6)	0.927
Malic acid	0.06 (0.05-0.07)	0.08 (0.05-0.09)	<b>0.005</b>
Maltose	0.01 (0.004-0.01)	0.04 (0.01-0.04)	<b>2.9x10<sup>-09</sup></b>
Methionine	3.7 (3.5-3.8)	3.6 (3.3-3.9)	0.264
Myo Inositol	0.5 (0.4-0.5)	0.6 (0.5-0.7)	<b>8.7x10<sup>-05</sup></b>
Oleic acid	17.4 (7.8-24.7)	21.3 (11.0-24.4)	0.249
Ornithine	14.2 (9.8-16.7)	12.7 (9.7-14.8)	0.57
Oxoproline	25.7 (21.6-29.6)	25.4 (21.1-28.9)	0.82
Phenylalanine	6.3 (5.9-6.7)	6.4 (5.5-7.3)	0.711
Phosphoric acid	150.6 (66.2-209.1)	191.3 (155.9-233.8)	<b>0.013</b>
Proline	29.8 (21.5-33.8)	33.1 (23.5-41.8)	0.119
Pyruvic acid	4.9 (3.2-6.2)	5.3 (2.8-6.7)	0.783
Ribonic acid	0.003 (0.002-0.004)	0.004 (0.003-0.005)	<b>0.025</b>
Sedoheptulose	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.417
Serine	8.6 (7.4-9.5)	8.1 (6.2-9.4)	0.147
Succinic acid	0.06 (0.05-0.07)	0.08 (0.06-0.1)	<b>2.8x10<sup>-04</sup></b>
Taurine	0.5 (0.4-0.6)	1.2 (0.6-1.2)	<b>4.2x10<sup>-08</sup></b>
Tetradecanoic acid	1.9 (1.2-2.1)	1.9 (1.1-2.2)	0.539
Threonic acid	0.3 (0.2-0.3)	0.4 (0.2-0.4)	<b>1.2x10<sup>-04</sup></b>
Threonine	9.0 (7.3-10.1)	8.0 (6.7-9.0)	<b>0.035</b>
Uracil	0.02 (0.01-0.02)	0.02 (0.02-0.03)	0.114
Urea	30.7 (22.8-36.9)	35.5 (26.3-40.4)	0.057
Uric acid	11.2 (6.2-15.4)	13.3 (7.3-19.5)	0.267
Valine	16.9 (15.4-18.3)	17.5 (14.6-19.4)	0.666
Vanillylmandelic acid	0.006 (0.005-0.008)	0.007 (0.006-0.01)	<b>0.001</b>
Xylonic acid	0.05 (0.04-0.05)	0.02 (0.01-0.02)	<b>6.5x10<sup>-17</sup></b>

Values are provided as median (interquartile range) and compared with the Mann-Whitney U test. *P*- Values in bold indicate statistical significance (*p*<0.05).

**Table S2.** Plasma concentrations (Relative Units) of metabolites of healthy controls and post-surgery breast cancer (BC) patients.

	<b>Control</b> (n = 49)	<b>Post-surgery</b> (n = 45)	<b>p- Value</b>
2-Hydroxybutyric acid	3.5 (2.0-3.9)	3.8 (2.0-5.4)	0.261
2-Hydroxyisobutyric acid	1.2 (0.9-1.3)	1.7 (1.3-2.1)	<b>2.7X10<sup>-06</sup></b>
2-Hydroxyisovaleric acid	4.8 (3.2-5.2)	6.2 (4.1-7.1)	<b>0.001</b>
2-keto-3-methylvaleric acid	1.2 (0.9-1.5)	1.4 (1.2-1.7)	<b>0.042</b>
3-hydroxybutyric acid	13.1 (5.1-18.6)	8.2 (3.5-9.7)	<b>0.021</b>
3-Hydroxyisovaleric acid	0.9 (0.6-1.1)	1.3 (0.8-1.4)	<b>0.006</b>
3-methyl-2-oxobutyric acid	0.6 (0.4-0.7)	0.6 (0.5-0.6)	<b>0.650</b>
3-Phosphoglyceric acid	0.03 (0.02-0.04)	0.1 (0.04-0.1)	<b>1.3X10<sup>-09</sup></b>
4-Hydroxybenzoic acid	0.12 (0.12-0.13)	0.12 (0.11-0.12)	0.191
4-hydroxyPhenyllactic acid	0.2 (0.1-0.2)	0.2 (0.1-0.2)	<b>3.2X10<sup>-04</sup></b>
4-Hydroxyproline	1.6 (1.1-1.9)	1.4 (0.9-1.7)	0.157
a-ketoglutaric acid	0.2 (0.1-0.2)	0.1 (0.1-0.2)	0.895
Alanine	21.1 (17.7-24.2)	28.2 (25.6-31.5)	<b>4.9X10<sup>-08</sup></b>
a-tocopherol	0.3 (0.1-0.4)	0.3 (0.2-0.3)	0.537
Benzoic acid	0.5 (0.3-0.6)	0.8 (0.5-0.9)	<b>1.6X10<sup>-05</sup></b>
Citric acid	17.5 (14.0-19.3)	18.3 (12.9-22.9)	0.775
d-Arabinose	0.02 (0.01-0.02)	0.05 (0.02-0.04)	<b>2.9X10<sup>-07</sup></b>
d-Arabitol	0.01 (0.01-0.01)	0.01 (0.01-0.02)	<b>3.1X10<sup>-08</sup></b>
d-Fructose	0.02 (0.01-0.02)	0.08 (0.02-0.06)	<b>1.3X10<sup>-05</sup></b>
d-Galactitol	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.903
DL-2-Hydroxyglutaric acid	0.04 (0.03-0.05)	0.04 (0.03-0.05)	0.868
d-Mannonic acid	0.02 (0.02-0.03)	0.05 (0.03-0.05)	<b>1.3X10<sup>-07</sup></b>
Dodecanoic acid	0.7 (0.4-0.7)	1.6 (1.0-1.7)	<b>1.2X10<sup>-10</sup></b>
d-Sucrose	0.003 (0.002-0.005)	0.03 (0.005-0.02)	<b>1.6X10<sup>-08</sup></b>
d-Threitol	0.02 (0.02-0.02)	0.05 (0.02-0.03)	<b>6.3X10<sup>-11</sup></b>
d-Xylitol	0.001 (0.001-0.001)	0.002 (0.001-0.002)	<b>1.0X10<sup>-04</sup></b>
d-Xylose	0.007 (0.005-0.01)	0.02 (0.01-0.02)	<b>7.2X10<sup>-05</sup></b>
Erythronic acid	0.02 (0.01-0.03)	0.03 (0.02-0.03)	<b>3.9X10<sup>-05</sup></b>
Ethanolamine	0.2 (0.2-0.3)	0.2 (0.2-0.3)	0.756
Ethylmalonic acid	5.6 (4.4-6.3)	3.2 (2.5-4.1)	<b>1.2X10<sup>-10</sup></b>
Fumaric acid	0.13 (0.10-0.14)	0.2 (0.1-0.2)	0.026
Galacturonic acid	0.02 (0.01-0.02)	0.03 (0.02-0.03)	<b>7.8X10<sup>-05</sup></b>
Glucose-6-phosphate	0.005 (0.004-0.007)	0.01 (0.007-0.01)	<b>6.0X10<sup>-07</sup></b>
Glutamic acid	3.9 (3.1-4.4)	6.3 (4.3-8.2)	<b>4.4X10<sup>-05</sup></b>
Glutamine	37.3 (28.2-44.4)	31.0 (25.3-34.5)	<b>0.005</b>
Glyceric acid	0.7 (0.5-0.8)	0.5 (0.3-0.6)	<b>1.1X10<sup>-04</sup></b>
Glycerol	1.7 (1.2-2.1)	1.1 (0.9-1.3)	<b>1.2X10<sup>-07</sup></b>
Glycerol-1-phosphate	0.2 (0.1-0.2)	0.2 (0.1-0.2)	0.952
Glycine	6.5 (6.0-7.0)	7.2 (6.6-7.8)	<b>1.5X10<sup>-05</sup></b>
Glycolic acid	0.2 (0.2-0.3)	0.2 (0.2-0.3)	0.892
Hippuric acid	0.4 (0.1-0.4)	0.3 (0.1-0.4)	0.284

Hydrocinnamic acid	0.09 (0.04-0.1)	0.09 (0.04-0.1)	0.728
Hypoxanthine	0.2 (0.1-0.3)	1.3 (0.3-0.9)	<b>1.1X10<sup>-09</sup></b>
Indole-3-propanoic acid	0.1 (0.08-0.2)	0.2 (0.1-0.3)	<b>1.8X10<sup>-04</sup></b>
Indolelactic acid	0.1 (0.1-0.2)	0.2 (0.2-0.3)	<b>4.5X10<sup>-06</sup></b>
Isoleucine	4.5 (3.9-5.1)	5.4 (4.5-6.0)	<b>4.3X10<sup>-04</sup></b>
Lactic acid	55.2 (42.8-62.4)	87.6 (65.9-108.7)	<b>1.1X10<sup>-08</sup></b>
Leucine	8.9 (8.0-9.8)	10.0 (8.5-11.5)	<b>0.013</b>
Linoleic acid	3.1 (1.5-4.0)	2.3 (1.1-2.9)	<b>0.010</b>
Malic acid	0.06 (0.05-0.07)	0.08 (0.05-0.08)	<b>0.003</b>
Maltose	0.006 (0.004-0.01)	0.04 (0.01-0.05)	<b>3.4X10<sup>-08</sup></b>
Methionine	3.7 (3.5-3.8)	3.8 (3.3-4.0)	0.862
Myo Inositol	0.5 (0.4-0.5)	0.7 (0.6-0.9)	<b>6.9X10<sup>-09</sup></b>
Oleic acid	17.4 (7.8-24.7)	16.1 (7.0-20.8)	0.258
Ornithine	14.1 (9.8-16.7)	15.5 (11.4-18.7)	0.118
Oxoproline	25.7 (21.6-29.6)	29.3 (24.1-34.5)	<b>0.006</b>
Phenylalanine	6.3 (5.9-6.7)	6.7 (5.7-7.4)	0.612
Phosphoric acid	150.7 (66.2-209.1)	334.9 (272.5-374.4)	<b>1.2X10<sup>-19</sup></b>
Proline	29.8 (21.5-33.8)	33.8 (25.9-41.1)	<b>0.021</b>
Pyruvic acid	4.9 (3.2-6.2)	7.4 (4.8-10.2)	<b>2.7X10<sup>-04</sup></b>
Ribonic acid	0.003 (0.002-0.004)	0.004 (0.003-0.005)	<b>0.012</b>
Sedoheptulose	0.02 (0.01-0.02)	0.02 (0.02-0.02)	<b>1.4X10<sup>-04</sup></b>
Serine	8.6 (7.4-9.5)	8.6 (7.4-9.6)	0.527
Succinic acid	0.06 (0.05-0.06)	0.09 (0.05-0.1)	<b>0.001</b>
Taurine	0.5 (0.4-0.7)	1.3 (0.7-1.4)	<b>1.1X10<sup>-08</sup></b>
Tetradecanoic acid	2.0 (1.2-2.1)	2.1 (1.3-2.3)	0.201
Threonic acid	0.3 (0.2-0.3)	0.3 (0.3-0.4)	<b>1.7X10<sup>-05</sup></b>
Threonine	9.0 (7.3-10.1)	8.6 (7.0-9.8)	0.316
Uracil	0.02 (0.01-0.02)	0.03 (0.02-0.03)	<b>0.040</b>
Urea	30.7 (22.8-36.9)	46.6 (35.0-55.7)	<b>1.6X10<sup>-07</sup></b>
Uric acid	11.2 (6.2-15.4)	17.8 (10.6-23.0)	<b>2.7X10<sup>-04</sup></b>
Valine	16.9 (15.4-18.3)	19.3 (16.5-21.5)	<b>2.0X10<sup>-04</sup></b>
Vanillylmandelic acid	0.006 (0.005-0.008)	0.01 (0.008-0.01)	<b>3.8X10<sup>-06</sup></b>
Xylonic acid	0.05 (0.04-0.05)	0.02 (0.01-0.02)	<b>4.9X10<sup>-16</sup></b>

Values are provided as median (interquartile range) and compared with the Mann-Whitney U test. *P*- Values in bold indicate statistical significance ( $p < 0.05$ ).

**Table S3.** Plasma concentrations (Relative Units) of metabolites of healthy controls and post-radiotherapy breast cancer (BC) patients.

	<b>Control</b> (n = 49)	<b>Post-RT</b> (n = 26)	<b>p-Value</b>
2-Hydroxybutyric acid	3.5 (2.0-3.9)	4.6 (3.0-6.2)	<b>0.005</b>
2-Hydroxyisobutyric acid	1.2 (0.9-1.3)	1.9 (1.3-2.4)	<b>5.0X10<sup>-06</sup></b>
2-Hydroxyisovaleric acid	4.8 (3.2-5.2)	5.2 (3.9-6.2)	<b>0.043</b>
2-keto-3-methylvaleric acid	1.2 (0.9-1.5)	1.4 (0.9-1.8)	0.311
3-hydroxybutyric acid	13.1 (5.2-18.6)	18.1 (5.5-17.6)	0.496
3-Hydroxyisovaleric acid	0.9 (0.6-1.1)	1.3 (0.9-1.5)	<b>0.005</b>
3-methyl-2-oxobutyric acid	0.6 (0.4-0.7)	0.76 (0.6-0.8)	<b>0.014</b>
3-Phosphoglyceric acid	0.03 (0.02-0.04)	0.05 (0.03-0.07)	<b>0.002</b>
4-Hydroxybenzoic acid	0.12 (0.12-0.13)	0.12 (0.11-0.12)	<b>0.046</b>
4-hydroxyPhenyllactic acid	0.2 (0.1-0.2)	0.2 (0.1-0.3)	<b>0.010</b>
4-Hydroxyproline	1.6 (1.1-1.9)	1.5 (0.9-1.9)	0.654
a-ketoglutaric acid	0.2 (0.1-0.2)	0.2 (0.1-0.2)	0.084
Alanine	21.1 (17.7-24.2)	26.7 (20.9-30.1)	<b>4.3X10<sup>-05</sup></b>
a-tocopherol	0.3 (0.1-0.4)	0.3 (0.2-0.4)	<b>0.049</b>
Benzoic acid	0.5 (0.3-0.6)	0.7 (0.4-0.9)	<b>0.030</b>
Citric acid	17.5 (13.9-19.3)	22.9 (17.9-25.6)	<b>0.001</b>
d-Arabinose	0.02 (0.01-0.02)	0.04 (0.02-0.04)	<b>0.006</b>
d-Arabitol	0.01 (0.01-0.01)	0.02 (0.01-0.02)	<b>1.2X10<sup>-07</sup></b>
d-Fructose	0.02 (0.01-0.02)	0.03 (0.01-0.03)	0.266
d-Galactitol	0.02 (0.02-0.03)	0.02 (0.02-0.02)	0.256
DL-2-Hydroxyglutaric acid	0.04 (0.03-0.05)	0.04 (0.03-0.05)	0.898
d-Mannonic acid	0.02 (0.02-0.03)	0.04 (0.02-0.04)	<b>1.5x10<sup>-04</sup></b>
Dodecanoic acid	0.7 (0.4-0.7)	2.2 (1.5-2.2)	<b>1.3X10<sup>-11</sup></b>
d-Sucrose	0.003 (0.002-0.005)	0.01 (0.004-0.02)	<b>5.7X10<sup>-05</sup></b>
d-Threitol	0.02 (0.02-0.02)	0.08 (0.02-0.03)	<b>9.8X10<sup>-09</sup></b>
d-Xylitol	0.001 (0.001-0.001)	0.02 (0.02-0.004)	<b>0.004</b>
d-Xylose	0.007 (0.005-0.01)	0.01 (0.01-0.02)	<b>0.005</b>
Erythronic acid	0.02 (0.02-0.03)	0.04 (0.02-0.04)	<b>7.6X10<sup>-05</sup></b>
Ethanolamine	0.2 (0.2-0.3)	0.2 (0.2-0.3)	0.867
Ethylmalonic acid	5.6 (4.4-6.3)	3.3 (2.3-4.1)	<b>3.4X10<sup>-08</sup></b>
Fumaric acid	0.1 (0.1-0.1)	0.2 (0.1-0.2)	<b>0.022</b>
Galacturonic acid	0.02 (0.02-0.02)	0.02 (0.02-0.03)	<b>0.011</b>
Glucose-6 -osphate	0.007 (0.006-0.01)	0.005 (0.004-0.007)	<b>3.3X10<sup>-05</sup></b>
Glutamic acid	3.9 (3.1-4.4)	4.76 (2.73-6.81)	0.468
Glutamine	37.3 (28.2-44.4)	35.9 (26.2-40.5)	0.728
Glyceric acid	0.7 (0.5-0.8)	0.4 (0.3-0.4)	<b>7.4X10<sup>-09</sup></b>
Glycerol	1.7 (1.2-2.1)	1.1 (0.7-1.4)	<b>1.1X10<sup>-05</sup></b>
Glycerol-1-phosphate	0.2 (0.1-0.2)	0.2 (0.1-0.2)	0.442
Glycine	6.5 (5.9-6.9)	6.9 (6.5-7.3)	<b>0.014</b>
Glycolic acid	0.2 (0.1-0.2)	0.2 (0.2-0.3)	0.828
Hippuric acid	0.4 (0.1-0.4)	0.4 (0.1-0.4)	0.978

Hydrocinnamic acid	0.09 (0.04-0.1)	0.08 (0.04-0.1)	0.960
Hypoxanthine	0.2 (0.1-0.3)	0.7 (0.3-0.4)	<b>0.001</b>
Indole-3-propanoic acid	0.1 (0.08-0.2)	0.2 (0.1-0.2)	<b>0.006</b>
Indolelactic acid	0.2 (0.1-0.2)	0.2 (0.1-0.2)	<b>0.005</b>
Isoleucine	4.5 (3.9-5.1)	5.0 (4.3-5.8)	0.136
Lactic acid	55.2 (42.8-62.4)	69.9 (51.7-88.4)	0.034
Leucine	8.9 (8.1-9.8)	10.1 (8.6-11.0)	<b>0.023</b>
Linoleic acid	3.1 (1.5-3.9)	3.0 (1.4-3.0)	0.623
Malic acid	0.06 (0.05-0.07)	0.08 (0.06-0.08)	<b>0.018</b>
Maltose	0.006 (0.004-0.01)	0.008 (0.004-0.01)	0.442
Methionine	3.7 (3.5-3.3)	3.9 (3.6-4.2)	<b>0.070</b>
Myo Inositol	0.5 (0.4-0.5)	0.7 (0.5-0.8)	<b>4.4X10<sup>-08</sup></b>
Oleic acid	17.4 (7.8-24.7)	20.8 (8.5-23.3)	0.654
Ornithine	14.1 (9.8-16.7)	13.9 (9.5-16.9)	0.812
Oxoproline	25.7 (21.6-29.6)	22.3 (17.3-25.6)	<b>0.012</b>
Phenylalanine	6.3 (5.9-6.7)	6.9 (6.4-7.4)	<b>0.018</b>
Phosphoric acid	150.6 (66.2-209.1)	292.1 (211.2-360.7)	<b>3.2X10<sup>-07</sup></b>
Proline	29.8 (21.5-33.8)	31.8 (20.3-37.7)	0.344
Pyruvic acid	4.9 (3.2-6.2)	8.1 (5.5-10.6)	<b>2.9X10<sup>-05</sup></b>
Ribonic acid	0.003 (0.002-0.004)	0.003 (0.002-0.005)	0.605
Sedoheptulose	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.060
Serine	8.6 (7.4-9.5)	8.9 (7.5-10.2)	0.576
Succinic acid	0.06 (0.05-0.07)	0.07 (0.05-0.07)	<b>0.025</b>
Taurine	0.5 (0.4-0.6)	1.2 (0.5-1.5)	<b>0.003</b>
Tetradecanoic acid	1.9 (1.2-2.1)	3.3 (1.8-3.3)	<b>0.001</b>
Threonic acid	0.3 (0.2-0.3)	0.4 (0.3-0.4)	<b>1.2X10<sup>-05</sup></b>
Threonine	9.0 (7.3-10.1)	9.8 (7.5-10.3)	0.448
Uracil	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.730
Urea	30.7 (22.8-36.9)	46.3 (35.0-53.6)	<b>1.1X10<sup>-06</sup></b>
Uric acid	11.2 (6.2-15.4)	17.6 (12.2-19.7)	<b>0.002</b>
Valine	16.9 (15.4-18.3)	19.5 (17.4-21.2)	<b>3.7X10<sup>-04</sup></b>
Vanillylmandelic acid	0.006 (0.005-0.008)	0.01 (0.008-0.01)	<b>1.9X10<sup>-07</sup></b>
Xylonic acid	0.05 (0.04-0.05)	0.02 (0.01-0.02)	<b>5.3X10<sup>-12</sup></b>

RT: Radiotherapy. Values are provided as median (interquartile range) and compared with the Mann-Whitney U test. *P*- Values in bold indicate statistical significance ( $p < 0.05$ ).

**Table S4.** Comparison of post-radiotherapy plasma concentrations (Relative Units) of metabolites between patients receiving prior adjuvant chemotherapy (ACT) or not.

	ACT (n = 11)	no ACT (n = 15)	<i>p</i> - Value
2-hydroxybutyric acid	3.3 (2.8-4.2)	3.9 (3.6-7.0)	0.058
2-hydroxyisobutyric acid	1.6 (1.3-1.9)	1.8 (1.3-2.4)	0.287
2-hydroxyisovaleric acid	4.5 (3.2-5.7)	5.5 (4.8-6.9)	0.052
2-keto-3-methylvaleric acid	1.0 (0.9-1.5)	1.6 (1.1-1.8)	0.126
3-hydroxybutyric acid	11.1 (4.7-19.9)	8.8 (7.1-11.6)	0.551
3-hydroxyisovaleric acid	1.0 (0.8-1.5)	1.3 (0.9-1.5)	0.421
3-methyl-2-oxobutyric acid	0.6 (0.5-0.7)	0.8 (0.6-0.8)	<b>0.014</b>
3-phosphoglyceric acid	0.04 (0.03-0.07)	0.03 (0.03-0.08)	0.959
4-hydroxybenzoic acid	0.12 (0.12-0.13)	0.12 (0.11- 0.13)	0.567
4-hydroxyphenyllactic acid	0.2 (0.1-0.2)	0.2 (0.1-0.3)	0.364
4-hydroxyproline	1.9 (1.2-2.4)	1.2 (0.9-1.5)	0.092
$\alpha$ -ketoglutaric acid	0.16 (0.14-0.2)	0.14 (0.12-0.2)	0.659
$\alpha$ -tocopherol	0.3 (0.2-0.4)	0.3 (0.3-0.4)	0.484
Alanine	29.2 (24.8-30.2)	28.4 (20.6-30.7)	0.517
Benzoic acid	0.6 (0.5-0.8)	0.6 (0.4-0.9)	0.755
Citric acid	23.6 (20.7-29.7)	20.6 (15.7-23.6)	0.082
d-arabinose	0.02 (0.01-0.03)	0.03 (0.02-0.05)	0.091
d-arabitol	0.02 (0.01-0.02)	0.01 (0.01-0.02)	0.498
d-fructose	0.02 (0.01-0.02)	0.02 (0.01-0.04)	0.716
d-galactitol	0.02 (0.02-0.02)	0.02 (0.02-0.02)	0.754
d-mannonic acid	0.04 (0.02-0.05)	0.03 (0.03-0.04)	0.835
d-sucrose	0.002 (0.001- 0.01)	0.01 (0.01-0.02)	0.230
d-threitol	0.02 (0.02-0.03)	0.03 (0.02-0.04)	0.297
d-xylitol	0.002 (0.001-0.002)	0.002 (0.001-0.002)	0.441
d-xylose	0.02 (0.01-0.03)	0.007 (0.005-0.008)	<b>0.002</b>
DL-2-hydroxyglutaric acid	0.04 (0.04-0.06)	0.04 (0.04-0.05)	0.515
Dodecanoic acid	2.4 (2.2-4.8)	1.6 (1.3-1.7)	<b>6.4x10<sup>-05</sup></b>
Erythronic acid	0.03 (0.02-0.05)	0.03 (0.02-0.04)	0.736
Ethanolamine	0.2 (0.2-0.3)	0.2 (0.2-0.3)	0.391
Ethylmalonic acid	4.2 (3.6-4.6)	2.8 (2.3-3.4)	0.031
Fumaric acid	0.1 (0.1-0.2)	0.1 (0.1-0.2)	0.421
Galacturonic acid	0.02 (0.02-0.03)	0.02 (0.02-0.03)	0.855
Glucose 6-phosphate	0.007 (0.005-0.008)	0.008 (0.007-0.01)	0.219
Glutamic acid	4.2 (2.3-7.4)	3.7 (3.2-6.3)	0.736
Glutamine	35.8 (31.3-40.3)	36.5 (24.4-40.1)	0.421
Glyceric acid	0.4 (0.3-0.4)	0.4 (0.3-0.5)	0.815
Glycerol	1.3 (0.9-1.6)	0.8 (0.8-1.1)	0.186
Glycerol-1-phosphate	0.2 (0.2-0.3)	0.1 (0.1-0.2)	0.008
Glycine	7.1 (6.4-7.5)	6.8 (6.4-7.1)	0.364
Glycolic acid	0.2 (0.2-0.3)	0.2 (0.2-0.3)	0.622
Hippuric acid	0.2 (0.1-0.4)	0.3 (0.2-0.4)	0.586

Hydrocinnamic acid	0.05 (0.01-0.07)	0.07 (0.05-0.1)	0.073
Hypoxanthine	0.3 (0.2-0.4)	0.3 (0.3-0.5)	0.243
Indole-3-propanoic acid	0.2 (0.1-0.2)	0.2 (0.1-0.2)	0.659
Indolelactic acid	0.2 (0.1-0.2)	0.2 (0.1-0.2)	0.938
Isoleucine	4.4 (4.1-5.9)	4.7 (4.4-6.0)	0.421
Lactic acid	50.8 (45.8-64.2)	64.0 (57.9-97.6)	<b>0.036</b>
Leucine	8.5 (8.1-11.6)	9.9 (8.9-11.5)	0.243
Linoleic acid	3.9 (2.6-4.8)	1.7 (1.3-2.6)	<b>0.010</b>
Malic acid	0.07 (0.06-0.08)	0.06 (0.06-0.09)	0.917
Maltose	0.006 (0.003-0.01)	0.01 (0.008-0.01)	0.051
Methionine	3.8 (3.7-4.1)	3.6 (3.5-4.2)	0.364
Myo-inositol	0.6 (0.5-0.7)	0.7 (0.5-0.8)	0.337
Oleic acid	19.2 (14.0-37.4)	11.9 (8.1-20.5)	0.102
Ornithine	10.9 (9.3-13.2)	12.4 (11.1-18.7)	0.337
Oxoproline	22.0 (15.8-23.6)	22.5 (18.9-26.9)	0.312
Phenylalanine	6.4 (6.1-7.4)	6.9 (6.4-8.3)	0.392
Phosphoric acid	235.6 (195.6-358.0)	291.4 (225.3-384.5)	0.551
Proline	30.6 (23.9-36.1)	37.5 (20.5-42.1)	0.337
Pyruvic acid	5.8 (4.4-8.9)	8.9 (5.8-11.6)	0.092
Ribonic acid	0.004 (0.003-0.006)	0.003 (0.002-0.005)	0.618
Sedoheptulose	0.02 (0.01-0.02)	0.02 (0.02-0.03)	0.405
Serine	8.9 (8.8-10.7)	8.1 (6.8-10.1)	0.169
Succinic acid	0.07 (0.07-0.1)	0.06 (0.05-0.07)	0.119
Taurine	0.5 (0.5-0.8)	0.9 (0.6-1.0)	0.082
Tetradecanoic acid	5.2 (3.0-5.6)	1.8 (1.6-2.3)	<b>1.86x10<sup>-04</sup></b>
Threonic acid	0.3 (0.3-0.4)	0.4 (0.3-0.5)	0.586
Threonine	10.3 (9.4-12.7)	8.3 (7.3-9.7)	0.102
Uracil	0.02 (0.01-0.02)	0.02 (0.01-0.02)	0.404
Urea	34.7 (32.9-50.8)	47.3 (40.9-61.6)	<b>0.036</b>
Uric acid	17.1 (14.3-23.3)	13.6 (9.7-19.3)	0.126
Valine	17.4 (16.2-22.3)	20.2 (18.2-21.1)	0.186
Vanillylmandelic acid	0.009 (0.007-0.01)	0.01 (0.009-0.01)	0.261
Xylonic acid	0.02 (0.01-0.02)	0.01 (0.01-0.02)	0.515

Values are provided as median (interquartile range) and compared with the Mann-Whitney U test. *P*- Values in bold indicate statistical significance ( $p < 0.05$ ).