**Supplementary Data**

**Supplementary Table 1.**

**Alterations of choline phospholipid metabolism in endometrial cancer are caused by choline kinase alpha overexpression and a hyperactivated deacylation pathway**

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**Running title:** Choline metabolism in endometrial cancer.

**Supplementary Table 1:** Metabolic alterations in endometrial cancer.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Metabolite** | **Integral region (ppm)** | | | **Multiplicity** | **Direction of change** | **% Change to Control** | **p-value** |
| Cholesterol | 0.63 | - | 0.72 | m | ↑ | 53.43 | 0.4772 |
| Ile | 0.93 | - | 0.95 | t | ↑ | 17.26 | 0.2135 |
| Leu | 0.95 | - | 0.98 | dd | ↑ | 44.63 | 0.0059 |
| Val | 0.98 | - | 1.00 | d | ↑ | 58.88 | 0.0019 |
| Ile | 1.00 | - | 1.03 | d | ↑ | 45.47 | 0.0506 |
| Val | 1.03 | - | 1.06 | d | ↑ | 48.59 | 0.0034 |
| Lactate | 1.32 | - | 1.40 | d | ↑ | 29.70 | 0.0756 |
| Ala | 1.47 | - | 1.49 | d | ↑ | 40.26 | 0.0077 |
| Unk 1.50 | 1.49 | - | 1.54 | q | ↑ | 18.86 | 0.3284 |
| Arg, Lys, Leu | 1.62 | - | 1.80 | m | ↑ | 9.19 | 0.7223 |
| Arg, Lys, Leu | 1.87 | - | 1.92 | m | ↑ | 30.52 | 0.3284 |
| Acetate | 1.92 | - | 1.93 | s | ↓ | -9.33 | 0.3743 |
| Arg | 1.93 | - | 1.95 | m | ↑ | 12.53 | 0.7223 |
| R 2.0 | 1.97 | - | 2.10 | m | ↑ | 26.43 | 0.0100 |
| Pro | 1.97 | - | 2.03 | m | ↑ | 54.97 | 0.0019 |
| R 2.1 | 2.10 | - | 2.19 | m | ↓ | -24.27 | 0.0621 |
| Acetoacetate | 2.23 | - | 2.24 | s | ↑ | 2.20 | 0.5340 |
| Glu | 2.30 | - | 2.40 | m | ↓ | -11.03 | 0.3284 |
| Glu | 2.30 | - | 2.40 | m | ↓ | -10.89 | 0.3284 |
| Unk 2.41 | 2.40 | - | 2.42 | s | ↓ | -10.94 | 0.3743 |
| Gln | 2.43 | - | 2.49 | m | ↓ | -10.21 | 0.3284 |
| GSH | 2.51 | - | 2.61 | m | ↓ | -43.86 | 0.0019 |
| Asp | 2.65 | - | 2.71 | dd | ↓ | -19.04 | 0.1551 |
| Asp | 2.79 | - | 2.84 | dd | ↑ | 87.65 | 0.1551 |
| GSH | 2.91 | - | 2.98 | m | ↓ | -37.64 | 0.0209 |
| Creatine, Creatinine | 3.03 | - | 3.04 | 2s | ↓ | -22.76 | 0.1097 |
| Unk 3.20 | 3.19 | - | 3.20 | s | ↑ | 84.07 | 0.0005 |
| Cho | 3.20 | - | 3.21 | s | ↑ | 1.75 | 0.8590 |
| R 3.22 | 3.22 | - | 3.24 | m | ↑ | 39.79 | 0.0621 |
| GPC, PCho | 3.22 | - | 3.24 | 2s | ↑ | 49.23 | 0.0330 |
| PCho | 3.22 | - | 3.23 | s | ↑ | 69.99 | 0.0100 |
| GPC | 3.23 | - | 3.24 | s | ↑ | 17.94 | 0.3284 |
| Taurine, myoinositol | 3.25 | - | 3.30 | 2t | ↓ | -30.02 | 0.0045 |
| Scyllo-inositol | 3.34 | - | 3.35 | s | ↓ | -60.12 | 0.0019 |
| Unk 3.35 | 3.35 | - | 3.38 | s | ↓ | -78.99 | 0.0077 |
| Taurine | 3.41 | - | 3.45 | t | ↓ | -25.04 | 0.0263 |
| Myo-inositol | 3.52 | - | 3.55 | dd | ↓ | -57.82 | 0.0005 |
| Gly | 3.55 | - | 3.56 | s | ↓ | -5.86 | 0.3284 |
| R 3.78 | 3.76 | - | 3.80 | m | ↓ | -19.92 | 0.1551 |
| beta-glucose | 3.88 | - | 3.92 | dd | ↓ | -13.03 | 0.1826 |
| Creatine | 3.92 | - | 3.95 | s | ↓ | -17.18 | 0.2481 |
| Serine | 3.95 | - | 3.97 | d | ↑ | 27.02 | 0.0621 |
| PE | 3.97 | - | 4.04 | td | ↓ | -6.25 | 0.4772 |
| Myo-inositol | 4.05 | - | 4.09 | t | ↓ | -60.90 | 0.0004 |
| Lactate | 4.09 | - | 4.14 | q | ↑ | 8.88 | 0.6569 |
| GPC | 4.31 | - | 4.34 | m | ↓ | -13.50 | 0.2135 |
| Inosine/adenosine | 4.43 | - | 4.45 | dd | ↓ | -43.51 | 0.0010 |
| Ascorbate | 4.51 | - | 4.53 | d | ↓ | -22.86 | 0.0914 |
| GSH | 4.56 | - | 4.61 | dd? | ↓ | -43.91 | 0.0129 |
| beta-glucose | 4.63 | - | 4.66 | d | ↓ | -39.14 | 0.0506 |
| alpha-glucose | 5.22 | - | 5.26 | d | ↑ | 35.41 | 0.4239 |
| Unsaturated lipids | 5.26 | - | 5.39 | m | ↑ | 3419.99 | 0.0034 |
| Lipids | 5.40 | - | 5.45 |  | ↑ | 491.07 | 0.4239 |
| Uridine | 5.88 | - | 5.94 | dd | ↓ | -26.45 | 0.5940 |
| Inosine/adenosine | 6.09 | - | 6.12 | d | ↓ | -60.62 | 0.0019 |
| Tyr | 6.87 | - | 6.92 | d | ↑ | 79.09 | 0.0077 |
| Tyr | 7.17 | - | 7.22 | d | ↑ | 45.02 | 0.1097 |
| Phe | 7.31 | - | 7.35 | d | ↑ | 25.93 | 0.0621 |
| Phe | 7.35 | - | 7.40 | m | ↑ | 1.95 | 0.9292 |
| Phe | 7.40 | - | 7.45 | m | ↑ | 511.63 | 0.0004 |
| Uridine | 7.87 | - | 7.91 | d | ↑ | 5.84 | 0.9292 |
| Unk 7.95 | 7.93 | - | 8.00 |  | ↑ | 307.75 | 0.0506 |
| Unk 8.0 | 8.00 | - | 8.02 | s | ↓ | -34.25 | 0.2863 |
| Hypoxanthine | 8.18 | - | 8.20 | s | ↑ | 32.01 | 0.2863 |
| Unk 8.2 | 8.20 | - | 8.23 | s | ↑ | 521.08 | 0.0034 |
| Inosine/adenosine | 8.23 | - | 8.25 | s | ↓ | -54.04 | 0.0025 |
| Inosine/adenosine | 8.34 | - | 8.37 | s | ↓ | -58.09 | 0.0025 |
| Formate | 8.45 | - | 8.46 | s | ↑ | 13.41 | 0.0914 |

The integral region indicates the signal that was selected for univariate testing. Fold changes are based on mean values in each tissue type. *P* values are derived from Mann-Whitney U test. Abbreviations: amino acids are abbreviated according to standard nomenclature; s-singlet; d-doublet; dd-double doublet; m-multiplet.