

# Supplementary Information

**Table S1.** Gene name, GenBank accession number, Forward and reverse primer sequence

| Gene     | Accession#     | Forward primer           | Reverse Primer         |
|----------|----------------|--------------------------|------------------------|
| HSF-1    | XM_005215151   | GCCATGAAGCACGAGAACGA     | GTTTGACTGCACCAGCGAGATG |
| HSPB8    | NM_001014955   | GGAGGTGTCTGGTAAACACGAAG  | GCTCTCTCCAAACGGTGAGTAA |
| HSPA5    | XM_024998380   | GATCAAGGCAACCGCATCAC     | GCTGCACGGACGGGTTCATT   |
| HSP90AB1 | NM_001079637   | GCTCAGACGAGGAGGATGATAGT  | CCAAGTGATCTTCCCAGTCATT |
| HSPA1A   | NM_203322      | ACGACGGAGACAAGCCTAAG     | GTCAGCACCATCGACGAGA    |
| CSN1S1   | XM_005208027   | CCCAACAGAAAGAACCTATG     | CCAATGGGATTAGGGATG     |
| CSN1S2   | XM_024993018   | AATCAGCCAGCGTTACCAG      | CCAGTCCAACCATAACCAGG   |
| CSN2     | XM_010806178   | GTGAGGAACAGCAGCAAACA     | CCAGGAGCAAAACCAAGAAC   |
| SLC3A2   | NM_001024488   | GAGCATTCCCTTGCTTGAC      | GCTCATGGTGCCTGAGTCG    |
| SLC7A5   | NM_174613      | CCGTACCCTCACTGGTGTTT     | AGATGAACCTTGATGGGCCG   |
| SLC36A1  | XM_015472327   | AGGGTCCTACATGCGGTTTG     | GGGGACCCATCAAGATGCC    |
| SLC38A2  | XM_024991403   | TGAAAAGCCATTATGCCGATGT   | CCCACAATCGCATTGCTCAG   |
| SLC38A9  | NM_001102163   | GGGCATAAAACAGGCTGGGT     | CTTGACCACTGCCAAAGGA    |
| SLC43A1  | NM_001206598   | TGGTACCCGTCCAAACACTT     | AGGAACCCCAGGAGTGAGAA   |
| AKT      | NM_173986.2    | CTGCACAAGCGAGGTGAGTA     | GAGAAGTTGTTGAGGGGCGA   |
| TSC1     | XM_010819002.2 | TACTGGGCCACGTCGTGAG      | CGTCGGTGTCCATCTTGAGAC  |
| TSC2     | XM_015469258.1 | GCAGCAGGATCCAGACCTCT     | GTCTCTGTGAGCTCCAGGTGG  |
| RHEB     | NM_001031764   | GCTAAGATGCCGAGTCCA       | CGTCAACGAGGATTTCCCC    |
| mTOR     | NM_001144096.3 | CTTCTTCCGTTCCATCTC       | CTTCCACTAAGGCTTCAT T   |
| EIF4EBP1 | NM_001077893   | GGAGTGTGCGAACTCACCTG     | AACTGTGACTCTTCACCGCC   |
| eIF4E    | NM_174310.3    | AGGGAGGGTATACAAGGAAAGGTT | TTTGTAGTGGTGGAGCCGCTC  |
| eEF2K    | NM_175813      | TCTCTGTCTCAATCAAG        | GGTCTCATCTGTATCTGT     |
| eEF2     | NM_001075121   | GAGATCCAGTGTCCAGAA       | GAAGCCAAAGGACTCATT     |
| RPS9     | XM_001101152   | CCTCGACCAAGAGCTGAAG      | CCTCCAGACCTCACGTTTGTTT |
| GAPDH    | XM_001034034   | TGGAAAGGCCATCACCATCT     | CCCACTTGATGTTGGCAG     |
| UXT      | XM_001037471   | TGTGGCCCTTGGATATGGTT     | GGTTGTGCTGAGCTCTGTG    |

Note: Heat shock factor 1, HSF-1; Heat shock protein beta-8, HSPB8; Heat shock protein 5, HSPA5; Heat shock protein 90 kDa alpha class B member 1, Hsp90AB1; Heat shock 70 kDa protein 1A, HspA1A;  $\alpha$ S1-casein, CSN1S1;  $\alpha$ S2-casein, CSN1S2;  $\beta$ -casein, CSN2; 4F2 cell-surface antigen heavy chain, SLC3A2; Large neutral amino acids transporter small subunit 1, SLC7A5; Proton-coupled amino acid transporter 1, SLC36A1; Sodium-coupled neutral amino acid transporter 2, SLC38A2; Large neutral amino acids transporter small subunit 3, SLC43A1; Sodium-coupled neutral amino acid transporter 9, SLC38A9; Serine/threonine-protein kinase, AKT; Tuberous sclerosis complex 1, TSC1; Tuberous sclerosis complex 2, TSC2; GTP-binding protein Rheb, RHEB; Mammalian Target of Rapamycin, mTOR; Eukaryotic translation initiation factor 4E binding protein 1, EIF4EBP1; Eukaryotic translation initiation factor 4E, eIF4E; Eukaryotic elongation factor 2 kinase, eEF2K; Elongation factor 2, eEF2; 40S ribosomal protein S9, RPS9; Glyceraldehyde-3-phosphate dehydrogenase, GAPDH; Ubiquitously expressed transcript protein, UXT.

**Table S2.** The results of identifiable metabolites

| type | All   | MS2 | MS1  | known(MS1+MS2) | unknown |
|------|-------|-----|------|----------------|---------|
| POS  | 12176 | 499 | 6668 | 7167           | 5009    |
| NEG  | 9737  | 197 | 5823 | 6020           | 3717    |

**Table S3.** The concentration of metabolites in the intracellular metabolic network in MAC-T cell

| Metabolites                     | Pvalue | fdr    | vip     | UP/DOWN |
|---------------------------------|--------|--------|---------|---------|
| Oleamide                        | 0.4223 | 0.7039 | 18.1061 | DOWN    |
| Glutathione                     | 0.0003 | 0.0143 | 17.2101 | UP      |
| Erucamide                       | 0.0029 | 0.0476 | 13.6265 | UP      |
| 3-Guanidinopropanoate           | 0.0001 | 0.0055 | 13.2997 | UP      |
| Allopurinol                     | 0.0024 | 0.0430 | 12.8180 | UP      |
| Phenylalanine                   | 0.0544 | 0.2783 | 7.6050  | UP      |
| Hypoxanthine                    | 0.0168 | 0.1443 | 7.2583  | UP      |
| Inosine                         | 0.0059 | 0.0740 | 6.8730  | UP      |
| L-Norleucine                    | 0.0043 | 0.0617 | 6.7312  | DOWN    |
| Oleoyl Ethyl Amide              | 0.5217 | 0.7656 | 6.4756  | DOWN    |
| Stearamide                      | 0.4155 | 0.7000 | 5.9004  | UP      |
| Isoleucine                      | 0.0347 | 0.2221 | 5.7392  | UP      |
| Indoline                        | 0.0653 | 0.3065 | 5.5393  | UP      |
| Tyrosine                        | 0.1403 | 0.4600 | 5.3867  | UP      |
| Pyroglutamic acid               | 0.0109 | 0.1084 | 5.2751  | UP      |
| Epigallocatechin                | 0.0000 | 0.0005 | 4.5760  | DOWN    |
| Palmitic amide                  | 0.5633 | 0.7895 | 4.4359  | DOWN    |
| 5'-Methylthioadenosine          | 0.0529 | 0.2736 | 4.3901  | UP      |
| Tryptophan                      | 0.0281 | 0.1960 | 4.2527  | UP      |
| Glutamate                       | 0.0004 | 0.0147 | 4.2018  | UP      |
| Proline                         | 0.0478 | 0.2596 | 4.1041  | UP      |
| Stearic acid                    | 0.1227 | 0.4288 | 4.1035  | DOWN    |
| Guanine                         | 0.0042 | 0.0604 | 4.0617  | UP      |
| L-threo-Sphingosine C-18        | 0.0005 | 0.0171 | 3.9782  | UP      |
| Niacinamide                     | 0.0324 | 0.2125 | 3.6737  | UP      |
| Deoxyguanosine 5'-monophosphate | 0.0002 | 0.0108 | 3.5411  | UP      |
| 2-Amino-2-methylbutanoate       | 0.2926 | 0.6133 | 3.2540  | UP      |
| N1-Acetylspermidine             | 0.0003 | 0.0138 | 3.2486  | UP      |
| Dihomo-gamma-Linolenic Acid     | 0.0425 | 0.2440 | 3.1404  | DOWN    |
| Arachidonic Acid                | 0.0348 | 0.2223 | 3.0759  | DOWN    |
| D-Glycerate 2-phosphate         | 0.0000 | 0.0005 | 3.0121  | DOWN    |
| Piperidine                      | 0.0332 | 0.2151 | 2.9379  | UP      |
| Pantothenic acid                | 0.0033 | 0.0520 | 2.8644  | UP      |
| sn-Glycero-3-phosphocholine     | 0.0165 | 0.1431 | 2.7575  | UP      |
| Guanosine                       | 0.1189 | 0.4218 | 2.6041  | UP      |
| Cys-Gly                         | 0.0008 | 0.0208 | 2.5300  | DOWN    |
| 5-oxo-D-proline                 | 0.0000 | 0.0044 | 2.4762  | UP      |
| Palmitoleic acid                | 0.2115 | 0.5403 | 2.1782  | DOWN    |
| S-Adenosyl-methionine           | 0.0082 | 0.0925 | 2.0626  | UP      |
| Adenosine                       | 0.1124 | 0.4103 | 2.0509  | UP      |
| Choline                         | 0.2834 | 0.6051 | 2.0471  | UP      |
| Methionine                      | 0.0619 | 0.2985 | 2.0343  | UP      |
| Histidine                       | 0.0336 | 0.2168 | 1.9398  | UP      |

|                                     |        |        |        |      |
|-------------------------------------|--------|--------|--------|------|
| Glutamine                           | 0.0286 | 0.1978 | 1.7607 | UP   |
| a-Linolenic acid                    | 0.2500 | 0.5743 | 1.5789 | DOWN |
| Aspartate                           | 0.0001 | 0.0054 | 1.4946 | UP   |
| Valnine                             | 0.3863 | 0.6799 | 1.3183 | UP   |
| Dihydrobiopterin                    | 0.0596 | 0.2921 | 1.1932 | DOWN |
| Aminoimidazole ribotide             | 0.0036 | 0.0543 | 1.1866 | UP   |
| Argnine                             | 0.2437 | 0.5685 | 1.1569 | UP   |
| Uridine diphosphate glucuronic acid | 0.0051 | 0.0686 | 1.1235 | UP   |
| Putrescine                          | 0.0891 | 0.3638 | 1.1212 | DOWN |
| 3-phosphoglycerate                  | 0.0000 | 0.0034 | 1.1035 | UP   |
| D-3-phosphoglycerate                | 0.0000 | 0.0034 | 1.1035 | UP   |
| Adrenic Acid                        | 0.2978 | 0.6183 | 1.0834 | DOWN |
| Spermidine                          | 0.3198 | 0.6357 | 1.0267 | DOWN |
| Cytosine                            | 0.0896 | 0.3653 | 0.8995 | UP   |
| Taurine                             | 0.3427 | 0.6524 | 0.8466 | UP   |
| Lysine                              | 0.0475 | 0.2593 | 0.7808 | DOWN |
| Alanine                             | 0.0043 | 0.0612 | 0.7641 | UP   |
| Serine                              | 0.0223 | 0.1717 | 0.7332 | UP   |
| Glycerol                            | 0.0033 | 0.0513 | 0.6569 | UP   |
| Creatine                            | 0.0001 | 0.0095 | 0.6244 | UP   |
| Uracil                              | 0.2443 | 0.5687 | 0.6097 | UP   |
| Nervonic acid                       | 0.2904 | 0.6108 | 0.6078 | DOWN |
| Citrulline                          | 0.3782 | 0.6746 | 0.5923 | DOWN |
| Caprylic acid                       | 0.0154 | 0.1358 | 0.5649 | DOWN |
| Threonine                           | 0.3446 | 0.6532 | 0.5589 | DOWN |
| Thiamin diphosphate                 | 0.0002 | 0.0125 | 0.5011 | DOWN |
| 4-Methyl-2-oxopentanoate            | 0.0989 | 0.3852 | 0.4278 | UP   |
| Asparagine                          | 0.0812 | 0.3456 | 0.3964 | UP   |
| (S)-Malate                          | 0.2434 | 0.5682 | 0.3841 | UP   |
| 3-Hydroxykynurenine                 | 0.2290 | 0.5566 | 0.3680 | DOWN |
| Myristic acid                       | 0.0190 | 0.1549 | 0.3436 | DOWN |
| Cysteine                            | 0.0377 | 0.2307 | 0.3296 | UP   |
| Kynurenine                          | 0.1068 | 0.3994 | 0.2267 | UP   |
| Ornithine                           | 0.6958 | 0.8618 | 0.1512 | UP   |
| UMP                                 | 0.2150 | 0.5440 | 0.1507 | DOWN |
| Fumarate                            | 0.3808 | 0.6763 | 0.1259 | DOWN |
| GMP                                 | 0.5978 | 0.8090 | 0.1104 | UP   |
| Acetyl CoA                          | 0.0231 | 0.1747 | 0.0947 | UP   |
| Glucose                             | 0.4437 | 0.7207 | 0.0880 | UP   |
| Glycine                             | 0.4262 | 0.7074 | 0.0874 | DOWN |
| Tetrahydrobiopterin                 | 0.6236 | 0.8203 | 0.0814 | DOWN |
| 1-Pyrroline-2-carboxylate           | 0.6191 | 0.8196 | 0.0738 | UP   |
| Leucine                             | 0.7887 | 0.9119 | 0.0476 | UP   |
| Pyruvate                            | 0.9543 | 0.9837 | 0.0464 | DOWN |

|                   |        |        |        |      |
|-------------------|--------|--------|--------|------|
| Glucose-6-P       | 0.4605 | 0.7301 | 0.0451 | UP   |
| Citrate acid      | 0.8106 | 0.9227 | 0.0376 | UP   |
| Hydroxypyruvate   | 0.8939 | 0.9608 | 0.0289 | DOWN |
| Spermine          | 0.6321 | 0.8246 | 0.0216 | DOWN |
| Cysteinyl glycine | 0.7045 | 0.8658 | 0.0111 | UP   |
| D-glycerate       | 0.8430 | 0.9384 | 0.0091 | DOWN |
| AMP               | 0.8418 | 0.9384 | 0.0090 | DOWN |
| Oxaloacetate      | 0.8384 | 0.9365 | 0.0064 | DOWN |

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