Glucose
G6P
F-6P
Ribose-5P
F-1.6-BP
Nucleotide Biosynthesis
G3P
DHAP
1,3-BPG
Formate
Serine One-Carbon Metabolism
3-PG
2-PG
Aspartate
GOT1
PEP
OAA
PCK1
MDH1
PKM1/2
Malate
ME1
Pyruvate
Alanine
LDHA/B/C
Glutamate
2-OG
Lactate

Cytosol

Mitochondrial Functions

ATP synthesis
Cytochrome C / caspase activation - cell death
Peroxide generation - thiol oxidation - gene expression
AMPK activation - catabolic regulation
mtDNA - inflammation
Chromatin modications / DNA methylation / PTM - affecting cell function and fate

Aspartate
GOT2
Acetyl-CoA
Gluconeogenesis
OAA
MDH2
ME2
CS Rate Limiting
Citrate
Malate
mFH
2-HB
ACO2
Pyruvate
cis-Aconitate
AA-CoA
Fumarate
SDHA/B/C
Succinate
Acetoacetate (AA)
Isocitrate
O2-> H2O Aerobic Respiration
FADH2<-FAD
IDH2/3
NAD+->NADH
ADP->ATP
Complex II
SCOT
ETC
OGDH
Succinyl-CoA
aKG (2-OG)
Complex I
-<-NADH<-NAD+
MDH2
2-HG
GABA
SSA
3-HB
GABA Shunt
Ornithine
Citrulline

Mitochondria

ADP
ATP

Ornithine
Fumarate

Cytosol

Brown Tissue
Thermogenesis
2-HB

Glyceral-3-Phosphate
Immune Regulation
Lipid Synthesis
Succinate
Lymphangiogenesis
FAO
Malonyl-CoA
Itaconate
2-HG
Acetyl-CoA
ACLY
Itaconate
MDH1
Citrate
OAA
Fe Sensor
Temp Sensor DNA repair
Citrate
Malate
ACO1
cFH
cis-Aconitate
Fumarate
Fumarate
SDH
Isocitrate
Succinate
Succinate
IDH1
OGDH
aKG (2-OG)
aKG (2-OG)
MDH1
BCAT
2-HG
2-HG
3-HB
Glutamate
ILE/VAL
HIFa
HO-HIFa
Normoxia Protein degradation
Glutamine
GSH
Hypoxia

Cytosol

HIF-1a-OH
PHD
HIF-1a
HIF-1 has been found to regulate the shift within tumor cells to anaerobic metabolism and to activate VEGF and angiogenesis, downregulation of the HIF-1 complex may suppress cancer progression.

Acetyl-CoA
Histone Acetylation
5mCytosine (5mC)
Thymine
Fumarate
Histone DNA demethylation
Succinate
Histone DNA demethylation
5-hydroxymethylC (5hmC)
5-hmUracil (5hmU)
aKG (2-OG)
Histone Methylation
5-formylC (5fC)
2-HG
Histone DNA demethylation
5-carboxyC (5caC)

Nucleus

T-Cell
loss of function
2-HG
aKG (2-OG)
Succinate

4-Guanidino-butanal
5-Amino oxoarginine
GABA 4-aminobutric acid
N-Acetyl-GABA
2-oxoarginine
Citrulline
NO
ASS1
ASP
4-Acetyl Butanamide
Arginosuccinate
ARG1/2
Ornithine
Urea
Cysteine
ODC
2-Hydroxyputrescine
ASL
Exit Cell
Di-Acetyl Spermidine
Agamatine
Arginine
speA
N-Methyl Putrescine
Putrescine
N-Acetyl Putrescine
N8-Acetyl Spermidine
H2O2
DHPS
SSAT
Spermidine
4-Aminobutanal
4-Methylamino butanal
H2O2
N-Acetyl Spermine
H2O2
Lys
Hypusine
Guanidino Acetate GAA
Nicotine
Spermine
Polyamine Synthesis
SSAT
4-amino-butyl-Lys
GATM
DHMO
Diaminopropane (DAP)
PhosphoCreatine pCr
CKB
Creatine
4-amino-2-Hydroxy-butyl-Lys (Hypusine)
beta-Alanine
DENSp
ATP - ADP Shuttle Muscle Contraction
Creatinine
Hypusine only in eIF5A-1 Cell Proliferation Factor RNA translation

HMT

Expanded TCA Cycle