

ANALYSIS OF TCA COMPOUNDS AND ADDITIONAL ORGANIC ACIDS

Description: UPLC-MS (QDa) method for the sensitive detection and quantification of TCA components and additional important organic acids. Detection limits depend on matrix type and input quantity. Samples are extracted using methanol, semi-purified, derivatized with 3-nitrophenylhydrazine and measured by UPLC-MS.

Analytes are reported as μM or $\text{pmol}/\text{mio cells}$ or $\text{pmol}/\text{mg tissue}$.

Container: Eppendorf Tube or equivalent

Optimal Volume: Plasma / cell culture medium (150 μL); Tissue (25 mg)¹; Cells (3 mio).

Minimal Volume: Plasma / cell culture medium (30 μL); Tissue (10 mg)¹; Cells (1.5 mio).

Sample Collection: Please see our detailed sample collection protocols.

Quantification: Absolute, using external calibration.

Please note: For human material, note any known presence of infectious agents

List of reported compounds

Compound name	Identifier	Formula	Monoisotopic mass
Lactate	HMDB0000190	$\text{C}_3\text{H}_6\text{O}_3$	90.032
Pyruvate	HMDB0000243	$\text{C}_3\text{H}_4\text{O}_3$	88.016
Malate	HMDB0000156	$\text{C}_4\text{H}_6\text{O}_5$	134.022
Oxalate	HMDB0002329	$\text{C}_2\text{H}_2\text{O}_4$	89.995
Citrate	HMDB0000094	$\text{C}_6\text{H}_8\text{O}_7$	192.027
Isocitrate	HMDB0000193	$\text{C}_6\text{H}_8\text{O}_7$	192.027
Ketoglutarate	HMDB0000208	$\text{C}_5\text{H}_6\text{O}_5$	146.022
Fumarate	HMDB0000134	$\text{C}_4\text{H}_4\text{O}_4$	116.011
Succinate	HMDB0000254	$\text{C}_4\text{H}_6\text{O}_4$	118.027
Itaconate	HMDB0002092	$\text{C}_5\text{H}_6\text{O}_4$	130.027
2-Hydroxyglutarate	HMDB0059655	$\text{C}_5\text{H}_8\text{O}_5$	148.037

¹ Pulverized/crushed (deep-frozen) and exact weight noted

LC conditions

Column	Waters HSS T3 100 x 2.1mm
Temperature	40° C
Mobile phase A	H2O + 0.1% FA
Mobile phase B	ACN + 0.1% FA
Flow	0.55 ml/min

Notes

Samples need to be snap-frozen and stored at -80°C.

Variations in sampling procedures will affect metabolite measurements.

¹ Pulverized/crushed (deep-frozen) and exact weight noted