Revision 3

Store at -20C

#17336

One-Carbon Metabolism Antibody Sampler Kit

Cell Signaling TECHNOLOGY®

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For Research Use Only. Not for Use in Diagnostic Procedures.

Product Includes	Product #	Quantity	Mol. Wt	Isotype/Source
AHCYL1/IRBIT (D3A5G) Rabbit mAb	94248	20 µl	61 kDa	Rabbit IgG
CBS (D8F2P) Rabbit mAb	14782	20 µl	61 kDa	Rabbit IgG
Cystathionine γ-Lyase (D1N1D) Rabbit mAb	19689	20 µl	44 kDa	Rabbit IgG
MTHFR (D1E4V) Rabbit mAb	25164	20 µl	78 kDa	Rabbit IgG
MTHFD1L (D8T7L) Rabbit mAb	14999	20 µl	106 kDa	Rabbit IgG
MTHFD2 (D8W9U) Rabbit mAb	41377	20 µl	35 kDa	Rabbit IgG
SHMT1 (D3B3J) Rabbit mAb	80715	20 µl	50 kDa	Rabbit IgG
Thymidylate Synthase (D5B3) XP® Rabbit mAb	9045	20 µl	30 kDa	Rabbit
Anti-rabbit IgG, HRP-linked Antibody	7074	100 µl		Goat

Please visit cellsignal.com for individual component applications, species cross-reactivity, dilutions, protocols, and additional product information.

Description

The One-Carbon Metabolism Antibody Sampler Kit provides an economical means of detecting select components involved in one-carbon metabolism pathway. The kit contains enough primary antibodies to perform at least two western blot experiments per antibody.

Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA, 50% glycerol and less than 0.02% sodium azide. Store at –20°C. Do not aliquot the antibody.

Background

One-carbon metabolism includes various enzymatic reactions involving the transfer of one-carbon groups mediated by folate cofactor (1). The activated one-carbon groups are used by various metabolic pathways, including purine synthesis, thymidine synthesis, and remethylation of homocysteine to methionine (1). S-adenosylhomocysteine hydrolase-like protein 1 (AHCYL1) is a member of the S-adenosylhomocysteine hydrolase family, which participates in the metabolism of S-adenosyl-L-homocysteine (2). Cystathionine beta-synthase (CBS) is a key enzyme involved in sulfur amino acid metabolism as it catalyzes the formation of cystathionine from serine and homocysteine (3,4). Cystathionine γ-lyase (CGL) is an enzyme in the transsulfuration pathway, a route in the metabolism of sulfur-containing amino acids (5). Methylenetetrahydrofolate reductase (MTHFR), a key enzyme in one-carbon metabolism, catalyzes the conversion of 5,10-methylenetetrahydrofolate to 5-methyltetrahydrofolate (1). 5-methyltetrahydrofolate donates its methyl group for remethylation of homocysteine to methionine (1). Methionine is further converted to S-adenosylmethionine (SAM), a major reactive methyl carrier (1). NADP+ dependent methylenetetrahydrofolate dehydrogenase 1-like (MTHFD1L) is a mitochondrial enzyme that catalyzes the production of formate from 10-formyl-tetrahydrofolate in one-carbon flow from mitochondria to cytoplasm (6,7). MTHFD2 is a bifunctional methylenetetrahydrofolate dehydrogenase/cyclohydrolase involved in mitochondrial folate metabolism (8). Serine hydroxymethyltransferase 1 (SHMT1) is a cytoplasmic serine hydroxylmethyltransferase (9,10). It catalyzes the conversion of serine to glycine with the transfer of β-carbon from serine to tetrahydrofolate (THF) to form 5, 10-methylene-THF (9, 10). The methylation of deoxyuridine monophosphate (dUMP) to deoxythymidine monophosphate (dTMP) is an essential step in the formation of thymine nucleotides, a process catalyzed by thymidylate synthase (TS or TYMS) (11-13).

Background References

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Limited Uses