LAB #: Sample Report
PATIENT: Sample Patient
ID: 00000000000
SEX: Male
DOB: 01/01/1965 AGE: 53

CLIENT #: 12345
DOCTOR: Sample Doctor
Doctor's Data, Inc.
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St. Charles, IL 60174 U.S.A.

Folate Metabolism Profile; plasma

	RESULT / UNIT	REFERENCE INTERVAL	PERCENTILE (2.5th, 16th, 50th, 84th, 97.5th)
5-Methyltetrahydrofolate (5-MTHF)	**40 nmol/L**	20- 66	
			95th, 97.5th
Folic Acid, unmodified	**< 1 nmol/L**	< 2.0	
Folinic Acid	**0.35 nmol/L**	< 1.00	
Tetrahydrofolate (THF)	**0.31 nmol/L**	< 1.00	

The level of total folate in red blood cells is commonly used an indication of folate (B-9) status. However the more rapidly changing plasma levels of the different forms of folate provide important clinical information with respect to the status of the most metabolically active forms of B-9 and disruption of folate metabolism. Adequate folate status and metabolism are essential for single carbon (methyl group) transfers that are involved in clearance of homocysteine, the production and repair of DNA/RNA, gene expression and appropriate cell division.

5-Methyltetrahydrofolate (5-MTHF) 5-MTHF is the most metabolically active form present in greatest abundance in plasma. It is produced by the enzyme MTHFR and donates methyl groups to homocysteine to regenerate methionine. 5-MTHF may be low in association with insufficient intake of dietary folate (abundant in dark green leafy vegetables), alcoholism, malabsorption, inherited single nucleotide polymorphisms (SNPs) variations in folate cycle enzymes (e.g. MTHFR) or gastrointestinal folate transporters, methotrexate, and some anticonvulsant medications. Deficiency is associated with megaloblastic anemia and appears to be associated with CVD, cancers, and impaired cognitive function, neurological development and detoxification.

High levels of 5-MTHF may be associated with excessive supplementation, or compromised activity of MTR (genetic variations, B-12 and/or zinc insufficiency, supplemental SAMe, excessive levels of nitric oxide, lead, mercury, acetylaldehyde, and inflammation) and MTRR. Reported symptoms include but are not limited to irritability, severe anxiety insomnia, achy joints, rash and headaches.

Folic Acid, unmodified (UMFA) Excess folic acid supplementation may increase the total plasma folate pool and UMFA. UMFA is not considered biologically active, and may block folate receptors thereby disrupting proper cell signaling. High levels of UMFA may promote the growth of existing cancers, and has been associated with increased cancer risks. Excess UMFA may exacerbate the effects of vitamin B-12 deficiency and has been associated with reduced fetal growth in the third trimester of pregnancy. UMFA levels may be affected by genetic polymorphism in the dihydrofolate reductase enzymes. Naturally occurring dietary folates do not contribute to UMFA levels.

Folinic Acid (5-formyl tetrahydryl folate, FA) FA is normally very low in plasma after an overnight fast due to rapid metabolism. Mutations that impair MTHFS function may increase the level of FA. FA is a non-methylated active form of folate that supports purine biosynthesis (DNA). FA is found naturally in foods (citrus fruits, green leafy vegetables) and also available as a pharmaceutical (Leucovorin); the latter is used a rescue drug to counter the folate wasting effects of methotrexate. FA is not converted to UMFA, but can be converted to active forms of folate. FA may be used in patients with inherited disorders of folate transport or with folate receptor autoantibodies as FA readily crosses into the brain.

Tetrahydrofolate (THF) THF is an active form of folate that is normally very low in plasma after an overnight fast due to very rapid metabolism. THF is metabolized by several enzymes in the folate pathway, and it is produced as a byproduct of MTR activity. THF is not converted to UMFA.

SPECIMEN DATA

Comments:

Date Collected: **07/03/2018** Time Collected:
Date Received: **07/06/2018** Fasting:
Date Completed: **07/11/2018**
Methodology: **LC-MS/MS**