



Folic acid utilization test Scientifically Supplemented with Folic Acid

Microreader™ MTHFR, MTRR Gene Polymorphism Detection Kit

Folic acid plays an important role in the growth and development of the human body. The human body cannot synthesize it by itself and must be ingested from the outside world. Insufficient folic acid supplementation or poor utilization ability will cause folic acid deficiency and lead to hyperhomocysteinemia. The lack of folic acid in pregnant women can lead to birth defects, and pregnant women themselves will also have many adverse symptoms. However, excessive supplementation of folic acid can also cause various side effects, and both excess and deficiency may cause problems.

Group	Insufficient folic acid supplementation	Excessive Folic Acid Supplementation
Embryo	Neural tube defects, Down syndrome, cleft lip and palate, congenital heart disease	Affecting zinc absorption leads to abnormal fetal development and autism in newborns
Pregnant woman	Gestational hypertension, preterm labor, preeclampsia, recurrent miscarriage, megaloblastic anemia	Cover up vitamin B12 deficiency, leading to physical weakness, neurasthenia and pernicious anemia in pregnant women Affects the absorption of zinc and damages the health of pregnant women trigger folic acid allergy
Male	Decreased sperm density, reduced motility, and abnormal chromosome number can lead to infertility, spontaneous abortion of spouses, and birth defects in newborns.	decreased sperm motility

Features

Blood card direct amplification	No need to extract DNA, save time and effort, reduce pollution	Simple and fast operation	Single-tube amplification, the whole process only takes 3 hours, suitable for automatic and batch detection
Accurate and comprehensive loci	Contains 2 key genes affecting folic acid metabolism, a total of 3 genetic loci	UNG Pollution Prevention System	Effectively avoid PCR product contamination
Results are intuitive and easy to read	Professional software assisted analysis and interpretation of results, fast and easy		

Applicable people

- Couples trying to conceive: Improving sperm and egg quality
- Pregnant women: prevention of birth defects, spontaneous abortion, gestational hypertension, etc.
- Women with adverse pregnancy history: prevention of recurrence of adverse pregnancy
- Women with unexplained habitual abortion: cause investigation
- Patients with hyperhomocysteinemia and H-type hypertension: regulating plasma homocysteine levels and preventing stroke

Detection loci

Tests and studies have shown that different populations have different abilities to utilize folic acid, so the required supplement doses are also different. 5,10-methylenetetrahydrofolate reductase (*MTHFR*) and methionine synthase reductase (*MTRR*) are key enzymes that affect folic acid metabolism, and their gene polymorphisms are responsible for the differences in folic acid utilization among individuals main reason. When the *MTHFR* or *MTRR* gene is mutated, the activity of its enzyme is reduced, which leads to the disorder of folic acid metabolism, and it is necessary to supplement more folic acid than ordinary people to maintain the normal demand of the human body.

In 2008, the Maternal and Child Health Center of the Chinese Center for Disease Control and Prevention listed folic acid utilization ability genetic testing and risk assessment as a clinical application guideline, suggesting that mothers-to-be should conduct folic acid utilization ability genetic testing before supplementing folic acid, and choose a personalized supplement plan based on risk classification. In addition, the detection of *MTHFR* and *MTRR* gene polymorphisms also has certain guiding significance for patients with hyperhomocysteinemia to supplement folic acid and reduce their risk of stroke.

Folic Acid Supplementation Program

Test results	Reference dose of folic acid supplementation for women			Men's folic acid supplement reference dosage
	3 months before pregnancy	Early pregnancy (0-12 weeks)	Second/late pregnancy (13-40 weeks)	
No risk found	400µg/d	400µg/d	Pay attention to food supplements, no additional supplements are required	Pay attention to dietary supplementation of folic acid in the first 3 months of planned pregnancy
Low risk	400µg/d	400µg/d	400µg/d	Strengthen dietary folic acid supplementation or supplement folic acid 400 µg/d in the first 3 months of planned pregnancy
Moderate risk	400µg/d	800µg/d	400µg/d	3-6 months before the planned pregnancy, strengthen dietary folic acid supplementation and supplement folic acid 600 µg/d
High risk	800µg/d	800µg/d	400µg/d	Strengthen dietary folic acid supplementation and supplement folic acid 800 µg/d in the first 6 months of planned pregnancy

Detection platform: multiplex fluorescent PCR amplification and capillary electrophoresis detection

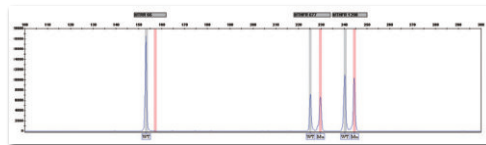
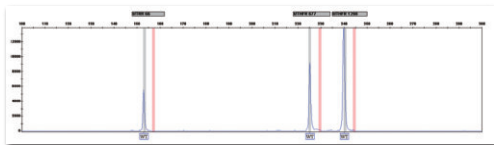
The c.677 and c.1298 sites of the *MTHFR* gene and the c.66 site of the *MTRR* gene that affect folic acid metabolism are amplified by multiplex fluorescent PCR, combined with capillary electrophoresis detection, and professional software is provided for analysis and interpretation of the results.

Detection process: **1** Sample collection **2** Multiplex fluorescent PCR amplification
3 Capillary electrophoresis detection **4** Result analysis

Test results

Wild type: *MTRR*(66AA), *MTHFR* (677CC, 1298AA)

Double heterozygous mutant: *MTRR*(66AA), *MTHFR* (677CT, 1298AC)



Sample type

- FTA Blood card
- EDTA/sodium citrate anticoagulant
- Oral swab

Applicable instrument

PCR machine: Life Technologies Holdings Pte Ltd: Veriti, Veriti Dx, 9700
 Genetic Analyzer: Life Technologies Holdings Pte Ltd: 3500, Seqstudio

※References :

- [1] Luo Li, et al. The relationship between folate metabolism gene polymorphism and birth defects. International Journal of Obstetrics and Gynecology. 2015(4):421-424.
- [2] "Compilation of Clinical Genetic Testing Items for Maternal and Child Health Care" Volume 6 Clinical Application Guidelines No. 21 "Folic Acid Utilization Ability"
- [3] Deng Yingfang, et al. Analysis of folic acid deficiency and *MTHFR*, *MTRR* gene polymorphisms in hyperhomocysteine (Hcy) patients. Chinese Journal of Molecular Cardiology. 2015(5):1463-1465.

※This product is only for scientific research use, and this information is only for reference by relevant medical professionals. Please refer to the instruction manual for details of contraindications or precautions.

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