Test Name: Folic Acid (vitamin B9)

<table>
<thead>
<tr>
<th>Specimen Required</th>
<th>Serum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Volume (Maximum)</td>
<td>1ml</td>
</tr>
<tr>
<td>Sample Volume (Minimum)</td>
<td>0.5 ml</td>
</tr>
<tr>
<td>Sample Container</td>
<td>Red top tube</td>
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</tbody>
</table>

Collection
Separate the serum / plasma within 2 hours of collection. Ensure complete clot formation has occurred and there are no fibrin threads. Do not use lysed serum for testing as it may give very high results. Do not use contaminated / turbid samples for testing. Process the sample on the same day.

Storage Instructions (Stability)
3 days at 2–8°C
>3 days -20°C

Causes for Rejection
Icterus
Hemolysis
Lipemia

Clinical Significance
Folic acid, a water soluble, light and temperature sensitive vitamin of the B complex (vitamin B9), is involved in all growth and development processes of the body. Folic acid is essential for the formation of red blood cells, for optimal functioning of the bone marrow and for healthy nerve activity. Moreover, folic acid is essential for cell division, therefore it is important in foetus development.

Although most plant and animal based foods contain folic acid, a deficiency of folic acid is the most widespread vitamin deficiency in Europe and North America. According to information from the German Nutritional Society (Deutschen Gesellschaft für Ernährung) only one in four Germans absorbs sufficient folic acid – the result of one-sided nutritional habits with little fresh fruit and vegetables. But also age, disease and the influence of specific medications e.g. Cotrimoxazol, may lead to resorption disturbances and to an associated deficiency.

Lowered folic acid levels occur because of:
• a decreased supply (e.g. through alcoholism or folic acid antagonists),
• a disrupted resorption (e.g. in celiac disease, CED),
• an increased requirement (e.g. during pregnancy, in anaemic or cancerous diseases).

Symptoms of Deficiency
The first symptoms of deficiency are weariness, irritability, concentration problems and loss of appetite; further consequences are inflammation of the mucous membranes, anaemia and grievous neurological damage.

During pregnancy – when the folic acid requirements are doubled – a deficiency in folic acid may lead to premature birth and severe abnormalities. An optimal supplementation of folic acid during the pregnancy can reduce the risk of neural tube defects in the foetus by 85%.

Because a deficiency of either vitamin B12 or folic acid may lead to megaloblastic anaemia, the determination of both vitamins is important for the clinical picture so that the correct vitamin may be supplemented. Otherwise, in the case of vitamin B12 deficiency, treatment of megaloblastic anaemia with folic acid may lead to irreversible damage of the central nervous system.

Folic Acid and Arteriosclerosis
A folic acid deficiency is known to be the most common cause of hyperhomocysteinaemia. Meanwhile, the hyperhomocysteinaemia has been recognised as an independent factor in arteriosclerosis. Therefore, the determination of folic acid can be carried out within the framework of a KHK risk analysis. Beside of the influence of folic acid on the homocysteine levels, a further positive effect on the endothelial function in heart patients has been established – development of nitrate tolerance during continuous nitrate therapy, e.g. in such patients, an increased release of oxygen radicals occurs without folic acid supplementation (Verhaar et al. 2002).

Indications
- Hyperchrome, macrocytic anemia
- Long-term therapy with antiepileptic drugs or folic acid antagonists
- Long-term haemodialysis
- Multiple birth pregnancy/ planned pregnancy
- Enhanced erythropoiesis
- Chronic liver disease s
- Hemoblastosis
- Psoriasis, Dermatitis
- Stomatitis, Glossitis
- Chronic alcohol abusus

Principle/Method
MTP