



Fund “Nauka” Project № 20005 Resume – Competition-Based Session 2020:

“Methylmalonic acid and 25-hydroxy vitamin D3 as new biomarkers for determining functional deficiencies of vitamin B12 and vitamin D3 during pregnancy”

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Aim: study of vitamin D3 and vitamin B12 status of pregnant women with normal and pathological pregnancy with the help of routine and new biomarkers that reliably reflect the functional deficiencies of vitamin D3 and vitamin B12, and to investigate the relationships with clinical characteristics and laboratory parameters assessing the course of pregnancy and fetal development.

Objectives:

1. Development of a new chromatographic method with mass-selective detection for quantification of serum methyl malonic acid (MMA);
2. Examination of established and new biomarkers and development of a new algorithm for early assessment of functional deficiencies of vitamins D3 and B12 in pregnant women in the first and third trimesters of pregnancy.

Patients: this 3-year study will include 300 pregnant women over the age of 18, selected according to inclusion and exclusion criteria.

An innovative, original combination of **methods** will be used:

1. Clinical methods – assessment of the course of pregnancy and fetal development;
2. Immunochemical methods – determination of total vitamin B12 and holotranscobalamin;
3. Chromatographic methods – determination of MMA and 25-hydroxy-vitamin-D3;
4. Questionnaires – assessment of diet and medical history.

Expected results:

1. A new modern chromatographic method with mass-selective detection for quantification of serum MMA will be developed;
2. A new data will be collected on the role of functional deficiencies of vitamins B12 and D3 for the occurrence of pregnancy complications, affecting both mother and newborn, insufficiently studied in Bulgaria and worldwide;
3. Through statistical modelling, the diagnostic reliability of a new algorithm for a combination of biomarkers will be established, allowing early detection of functional deficiencies of vitamins B12 and D3 in pregnant women.