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Fund "Nauka" Project № 22025 Resume – Competition-Based Session 2022: "Molecular biomarkers in children with generalized developmental disorder" Project leader: Prof. Ruzha Zlatanova Pancheva-Dimitrova, MD, PhD

Aim: To investigate the role of molecular biomarkers of oxidative stress, generalized development disorder (GDD)-specific miRNAs, haemopoietin and cobalamin status in the course and severity of disorders in children with GDD.

Study subject: 50 children with GDD aged 2-18 years, selected according to inclusion and exclusion criteria.

An innovative, original combination of methods is used:

- 1. Documentary, sociological assessment of neuro-psychiatric development (Childhood GDD Rating Scale CARS) and diagnostic interview for GDD (ADI-R);
- 2. Clinical assessment of the course of the disease and the severity of the disorders;
- 3. Immunochemical determination of haemopoietin and holotranscobalamin;
- 4. Chromatographic determination of methylmalonic acid (MMA);
- 5. Spectrophotometric assessment of oxidative stress indicators;
- 6. Genetic study of the expression of disease-specific miRNAs.

Expected short-term results:

- 1. New data will be obtained on expression levels of disease-specific miRNAs, serum levels of haemopoietin and methylmalonic acid, and cobalamin status in children with GDD;
- 2. New data will be obtained on the role of oxidative stress in children with GDD;
- 3. New data will be obtained on the relationships between the biomarkers studied and the indicators assessing the course and severity of the disorders in children with GDD;
- 4. New data will be obtained on the changes in the biomarkers studied in dynamics, before and after a standard 2-year treatment program;

Expected long-term results:

- 5. The results of the implemented project would allow a more accurate diagnosis of functional cobalamin deficiency and timely correction by supplementation, thus enabling a reduction in the severity of the course of GDD;
- 6. The results of the project will serve as a basis for the development of an algorithm including biomarkers associated with different aspects of the disease and the possibility of creating and testing a predictive logic model.

Such data will advance knowledge in a still unclear area, improve practices for followup of children with GDD, and will be published in peer-reviewed journals from which citations are expected.