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Fund “Nauka” Project № 18010 Resume – Competition-Based Session 2018:

“Identification of new generation biomarkers for assessment of activity and follow-up of patients with Systemic lupus erythematosus”

Project leader: Assoc. prof. Maria Atanasova Radanova, PhD

Systemic lupus erythematosus (SLE) is an autoimmune disease with broad-spectrum organ manifestations, multiple autoantibodies, and multifactorial immunological pathogenesis. In 25%-50% of randomly selected patients with SLE, clinical and laboratory data on lupus nephritis (LN) are established at the time of diagnosis of SLE, and about 60% of adult SLE patients develop nephropathy later in the autoimmune disease. LN is one of the most serious, significant and frequent manifestations of SLE. Conventional laboratory markers for diagnosis and assessment of the disease activity are characterized by low sensitivity and specificity in terms of their role in monitoring LN. This also necessitates the expansion of the serum multi-panel of biomarkers in LN. In recent years, the application of more advanced screening technologies such as gene expression, microarray technology and deep sequencing have opened up new categories of biomarkers, such as circulating non-protein-encoding endogenous RNAs (non-coding RNAs, ncRNAs). Among them, long-chain non-coding RNAs (lncRNAs) appear to have the potential for better diagnostic accuracy. LncRNAs are involved in the pathogenesis of immuno-mediated inflammatory diseases such as rheumatoid arthritis, autoimmune thyroiditis and SLE. This makes them suitable targets for therapy and allows them to be studied as potential biomarkers for early diagnosis and assessment of activity in SLE and LN.

That is why the aim of the present study is to identify new generation biomarkers for diagnostic assessment of activity and follow-up of patients with systemic lupus erythematosus (SLE).

The following research tasks are planned for the realization of the aim:

1. Selection of SLE patients with and without nephropathy for inclusion in groups with characteristic clinical manifestation of the disease; selection of healthy volunteers for a control group;
2. Isolation of total RNA from patients’ and healthy controls’ blood;
3. Forming pools of RNAs for deep sequencing;
4. Analysis of the expression levels of individual long non-coding RNAs (lncRNAs) in SLE patients’ plasma in relation to: presence or absence of lupus

nephropathy; different clinical and laboratory activity of lupus nephritis; levels of classical markers for assessment of lupus nephritis activity.

As a result of the realization of the current project, new data are expected to be obtained for:

1. Potential differential and diagnostic biomarkers in SLE and lupus nephritis;
2. Potential prognostic markers for lupus nephritis;
3. Potential new biomarkers of disease activity with relative autonomy for SLE monitoring.