Abstract:

Autoimmune diseases currently represent the most serious medical issues, mainly due to generally increasing number of patients with these diseases. Their pathogenesis is likely caused by hereditary factors, cellular and humoral interactions influenced by external environmental factors, whose knowledge is important both for diagnostics and therapy, and for theoretical immunology.

The aim was to examine the correlation between genetic alterations and the production of autoantibodies, clinical manifestation of the disease; to identify joint autoantigens, further to demonstrate development of leukemic cells from originally autoreactive B cells, the role of B lymphocytes in the pathogenesis of the disease and finally to develop a method for detection of B cells recognizing a defined autoantigen.

Several predisposing polymorphisms were revealed using genetic analysis however, they were not exclusively associated either to clinical forms of the disease or usable as prediction markers. In addition, the frequency of alleles IL-1RN * 2 and PD3.1 showed ethno-geographical differences and a critical role of size of sample cohorts in assessing of significance of particular polymorphism was demonstrated in GWA studies.

The combination of examination of anti-CCP and IgM RF was found as the best and most sensitive marker to predict progression of erosive RA. The presence of endogenous cartilage proteins MIA and HC gp-39 with immunogenic properties was confirmed in synovial fluid and tissue of patients with RA. The development of B cell leukemia from originally autoreactive B cells. The considerable heterogeneity at the molecular level and abnormal retention of Ig mRNA were observed in patients with SjS.

Finally, a method of direct detection of $CD19^{+}$ B cells recognizing the peptides containing citrulline was developed. This population showed heterogeneity at the molecular level therefore, its specific removal from peripheral blood or joint tissue may not be clinically applicable.