Abstract and Key words

This diploma thesis is focused on assessing the potential benefit of HLA epitopes for the prediction of de novo antibody production at kidney transplant recipients. The topic and patient selection criteria were selected in accordance with the 18th International HLA and Immunogenetics workshop (IHIWS), which is taking place in May 2022 in the Netherlands, where our data will also be contributed. Our aims were to compare HLA antigens mismatches (counted as total number of mismatched alleles) defined on the high-resolution level by NGS sequencing, HLA eplets mismatches defined by HLA matchmaker, and amino acid mismatches defined by HLA EMMA in their capacity to predict de novo antibody production and compare these results to other works by different authors from this field. We have identified N= 28 patients who developed de novo antibodies and N= 19 who didn't develop de novo antibodies in 5 years follow up their transplant. These two cohorts were compared based on all three approaches and correlation between number of mismatches and number of patients with de novo antibodies were made using ROC curves. Superiority of eplet mismatches over HLA antigen mismatches (total number of mismatched alleles) defined on high resolution was not detected. The HLA epitopes identified by the HLA matchmaker were further analyzed for their theoretical immunogenic potential. We managed to stratify each epitope defined by HLA matchmaker based on their theoretical immunogenicity value and created list of the 10 potentially most and least immunogenic epitopes.

Key words: HLA antigens, eplet, epitope, DSA, HLA Matchmaker, HLA EMMA