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TYPE II DIABETES MELLITUS HAS NO MAJOR INFLUENCE ON PLATELET MICRO-RNA EXPRESSION: RESULTS FROM MICRO-ARRAY PROFILING IN A COHORT OF 60 PATIENTS

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Background: Blood platelets represent pro-inflammatory mediators in the development of atherosclerosis. Diabetes mellitus as a major contributor to cardiovascular disease burden induces dysfunctional platelets. Platelets contain abundant miRNAs, which recently have been linked tightly to inflammation. While plasma miRNAs are affected by Diabetes mellitus, no data exist on platelet miRNA profiles in this disease. Therefore, this study sought to explore the miRNA profile of platelets in patients with Diabetes mellitus.

Methods: Platelet miRNA profiles were assessed in matched clinically stable diabetic and nondiabetic patients (each n=30). Platelet miRNA was isolated from leucocyte-depleted platelet-rich plasma, and miRNA profiling was performed using LNA micro-array technology (miRBase 18.0, containing 1,917 human miRNAs). Effects of diabetes mellitus were explored by a linear mixed effects model and resampling techniques for each miRNA . Platelet phenotype was assessed by light transmission aggregometry and impedance aggregometry.

Results: Platelets in both groups demonstrated miRNA expression profiles comparable to previously published data. The statistical analysis unveiled a signature of only three miRNAs (miR-377-5p, miR-628-3p, miR-3137) with high reselection probabilities in resampling techniques. Functional annotation of predicted targets for these miRNAs pointed towards an influence of diabetes mellitus on mRNA processing.

Conclusions: Previously described differences in plasma miRNAs between diabetic and nondiabetic patients cannot be explained by plain changes in the platelet miRNA profile. In consequence, other mechanisms such as alternative cellular sources or specific enrichment of miRNAs in platelet microparticles remain to be explored. Differentially expressed miRNAs in platelets of diabetes mellitus patients are associated with mRNA processing.