Title of the project: Genetic polymorphisms, MicroRNAs and bioindicators of activity: interrelations in the diagnostics and therapy of severe familial hypercholesterolemia

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Summary of 2019 results

Title of the presentation: Influence of lipoprotein apheresis on circulating plasma levels of miRNAs in patients with high Lp(a)

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Background: Lipoprotein apheresis (LA) is a well-established therapy for lowering lipid levels in serious cases of dyslipidaemia, including high levels of lipoprotein(a) [Lp(a)]. This method lowers both LDL cholesterol and Lp(a) by more than 60% in most of patients; however, because randomized clinical studies could be extremely difficult, also other markers of the effect of this procedures on vascular health are of importance. Therefore, in addition to changes in plasma lipids and Lp(a) during LA, we also analysed the response of biomarkers associated with vascular integrity: small non-coding microRNAs (miRNAs).

Materials and methods: We analysed the changes in miRNAs in two women (age 70 and 72 years) with clinically manifest extensive and progressive atherosclerotic disease and high levels of Lp(a) and with different clinical course who were treated by LA. In both women we analysed changes of 175 circulating plasma miRNAs using pre-defined serum/plasma focus panels at the beginning of and one year after the therapy.

Results: In addition to reduced levels of plasma lipids and Lp(a), circulating plasma levels of miR-193a-5p; -215-5p; -328-3p; -130a-3p; -362-3p; -92b-3p decreased, and levels of miR-125a-5p; -185-5p; -106a-5p; -320b; -19a increased (all P < 0.05) in both women. Moderate differences were found between both women with regard to the different course of atherosclerotic disease.

Conclusions: Long-term LA substantially changes circulating plasma miRNAs associated with vascular integrity reflected different clinical course in both women. If confirmed, this approach could improve the assessment of the effectiveness of this therapy on an individual basis.

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