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RESEARCH AREA

Based on platelet function tests, the prevalence of ex vivo High on-Treatment Platelet Reactivity (HTPR) in cardiovascular patients varies according to the chosen TAG therapy. The aim of our research is to screen patients with HTPR using a new method (platelet antisedimentation rate, TAR), and to combine it with the determination of the number of platelet-derived microparticles (PMP) that can be measured in the circulation. In clinical practice, the ex vivo effectiveness of TAG therapy (responder vs. low or non-responder) is measured using impedance aggregometry (Multiplate™, Roche). The goal of our development is to select patients with an increased thrombotic risk by using the combination of TAR and other platelet parameters (high-immature platelet fraction, H-IPF), as well as PMP and miRNA, ensuring adequate prevention by individualized antiplatelet therapy.

i. The platelets of the blood fractions (upper vs. lower blood sample) separated after one hour of sedimentation of the whole blood differ in many of their properties; ii. The level of platelet antisedimentation rate (TAR) is related to age and certain pathological changes; iii. The value of the area under the curve (AUCupper sample) of the upper blood fraction separated by one-hour sedimentation of the whole blood measured by Multiplate aggregometry is an independent predictor of the HTPR status; iv. During the 3-year follow-up of post-stroke patients taking clopidogrel, the neutrophil antisedimentation rate (NAR) and the AUCupper sample were independent predictors of recurrent ischemic episodes. Furthermore, the total MP measured in the circulation and the number of platelet-derived (CD42+) MP in the upper fraction proved to be sensitive predictors of thrombotic events; v. The H-IPF (%) value of the upper fraction separated by one-hour sedimentation of whole blood may also be suitable for the separation of HTPR; vi. HTPR can also be related to the morphological properties of the most immature platelet shapes (electron microscopy, EM and atomic force microscopy, AFM).

TECHNIQUES AVAILABLE IN THE LAB

Laboratory methodology: blood sampling techniques; platelet aggregometric tests, microparticle and miRNA measurement, electron microscopy; atomic force microscopy.
Clinical data collection: learning how to use an electronic patient record database.

SELECTED PUBLICATIONS

Molnar, T., Varnai, R., Schranz, D., Zavori, L., Peterfi, Z., Sipos, D., Tőkés-Füzesi, M., Illes, Zs., Buki, A., Csecsei, P. (2021) Severe Fatigue and Memory Impairment Are Associated with Lower Serum Level of Anti-SARS-CoV-2 Antibodies in Patients with Post-COVID Symptoms. **J Clin Med 10:** 4337.

Schrick, D., Tőkés-Füzesi, M., Réger, B., **Molnár, T.** (2021) Plasma Fibrinogen Independently Predicts Hypofibrinolysis in Severe COVID-19. **Metabolites 11:** 826.

Varnai, R., **Molnar, T.,** Zavori, L., Tőkés-Füzesi, M., Illes, Zs., Kanizsai, A., Csecsei, P. (2022) Serum Level of Anti-Nucleocapsid, but Not Anti-Spike Antibody, Is Associated with Improvement of Long COVID Symptoms. **Vaccines (Basel) 10:** 165.

Spantler, D., **Molnar, T.,** Simon, D., Berki, T., Buki, A., Schwarcz, A., Csecsei, P. (2022) Biomarker Associations in Delayed Cerebral Ischemia after Aneurysmal Subarachnoid Hemorrhage. **Int J Mol sci 23:** 8789.

Csecsei, P., Olah, Cs., Varnai, R., Simon, D., Erdo-Bonyar, Sz., Berki, T., Czabajszki, M., Zavori, L., Schwarcz, A., **Molnar, T.** (2023) Different Kinetics of Serum ADAMTS13, GDF-15, and Neutrophil Gelatinase-Associated Lipocalin in the Early Phase of Aneurysmal Subarachnoid Hemorrhage. **Int J Mol Sci 24:** 11005.