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RESEARCH AREA

Clinical research in the field of hemostasis: investigation of the underlying causes of unsuccessful thrombolysis therapy in acute ischemic stroke patients. Background: Recombinant tissue plasminogen activator (rt-PA) is currently the most important registered pharmacological treatment for the dissolution of blood clots in case of acute ischemic stroke. The therapy can be successfully used within 4.5 hours from the onset of stroke symptoms. Although the use of rt-PA is safe and effective in most cases, its main side effect is intracerebral hemorrhage with a potentially fatal outcome, which occurs in about 6-8% of patients. On the other hand, the lysis of the blood clot is only successful in about 30-40% of the patients, therefore, clinical improvement is often not achieved. Currently, little is known about why some patients develop a hemorrhagic complication while in others the same therapy will be ineffective. In our research, we examine the potential role of the blood coagulation system in the outcomes of patients. By using blood samples of acute ischemic stroke patients stored in our biobank, we can observe the level and genetic variations of the individual proteins involved in blood coagulation and compare the results with the outcome of the patients. Such observations may help to explain adverse outcomes and can serve as the basis for more effective treatments in the future.

TECHNIQUES AVAILABLE IN THE LAB

Handling and preanalytics of blood samples, DNA separation, performing special hemostasis assays (determining the activity and antigen levels of hemostasis factors, carrying out global hemostasis tests, performing special fibrinolysis tests, performing tests indicating coagulation activation), testing polymorphisms, inflammatory markers, testing neutrophil extracellular traps, learning basic statistical methods, learning the most important aspects of clinical trials.

SELECTED PUBLICATIONS

Székely, E.G., Orbán-Kálmándi, R., Szegedi, I., Katona, É., Baráth, B., Czuriga-Kovács, K.R., Lóczi, L., Vasas, N., Fekete, I., Fekete, K., Berényi, E., Oláh, L., Csiba, L., **Bagoly, Z.** (2022) Low α2-Plasmin Inhibitor Antigen Levels on Admission Are Associated With More Severe Stroke and Unfavorable Outcomes in Acute Ischemic Stroke Patients Treated With Intravenous Thrombolysis. **Front Cardiovasc Med 9:** 901286.

Lóczi, L., Orbán-Kálmándi, R., Árokszállási, T., Fekete, I., Fekete, K., Héja, M., Tóth, J., Csiba, L., **Bagoly, Z.** (2021) Thrombin generation as a predictor of outcomes in patients with non-traumatic intracerebral hemorrhage. **Front Neurol 13:** 912664.

Orbán-Kálmándi, R., Szegedi, I., Sarkady, F., Fekete, I., Fekete, K., Vasas, N., Berényi, E., Csiba, L., **Bagoly, Z.** (2021) A modified in vitro clot lysis assay predicts outcomes and safety in acute ischemic stroke patients undergoing intravenous thrombolysis. **Sci Rep 1:** 12713.

Orbán-Kálmándi, R., Árokszállási, T., Fekete, I., Fekete, K., Héja, M., Tóth, J., Sarkady, F., Csiba, L., **Bagoly, Z.** (2021) A modified in vitro clot lysis assay predicts outcomes in non-traumatic intracerebral hemorrhage stroke patients - the IRONHEART study. **Front Neurol 12:** 613441.

Székely, E.G., Czuriga-Kovács, K.R., Bereczky, Z., Katona, É., Mezei, Z.A., Nagy, A., Tóth, N.K., Berényi, E., Muszbek, L., Csiba, L., **Bagoly, Z.** (2018) Low factor XIII levels after intravenous thrombolysis predict short-term mortality in ischemic stroke patients. **Sci Rep 8:** e7662.