KATALIN MONOSTORY

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RESEARCH AREA

Many undesired side-effects or therapeutic failure of drugs are the results of differences or alterations of drug metabolism. The team of the Metabolic Drug-interaction Research Group deals with interindividual differences in metabolism and elimination of drugs. Their research activities focus on the function and regulation of cytochrome P450 (CYP) enzymes, primarily involved in the metabolism of xenobiotics.
Biochemical, molecular biological and mass spectrometric approaches are applied for studying i) metabolism and pharmacokinetic interactions of drugs and drug-candidates under development, ii) factors influencing the expression and function of CYP enzymes (hormonal status, disease, drug therapy, smoking), iii) moreover, diagnostic approaches for patients' drug metabolism capacity provide tools for personalized medication, iv) and in vitro models are developed that can be used in toxicological and safety studies.

TECHNIQUES AVAILABLE IN THE LAB

- isolation of leukocytes/PBMC (peripheral blood mononuclear cells) from blood,
- isolation of nucleic acids (RNA, DNA, miRNA) from various biological samples,
- RT-PCR and high-throughput RT-PCR for analysis of SNVs (single nucleotide variations), mRNA expression and miRNA concentration,
- Western blot analysis of protein expression,
- isolation of primary hepatocytes, hepatic microsomes and lysosomes,
- in vitro pharmacokinetics and metabolism in hepatocytes.

SELECTED PUBLICATIONS

Kiss, Á., Menus, Á., Tóth, K., Déri, M., Sirok, D., Gabri, E., Belic, A., Csukly, G., Bitter, I., & **Monostory, K.** (2020). Phenoconversion of CYP2D6 by inhibitors modifies aripiprazole exposure. **Eur Arch Psychiatry Clin Neurosci 270**(1): 71–82.

Csikány, N., Kiss, Á., Déri, M., Fekete, F., Minus, A., Tóth, K., Temesvári, M., Sárváry, E., Bihari, L., Gerlei, Z., Kóbori, L., & **Monostory, K.** (2021). Clinical significance of personalized tacrolimus dosing by adjusting to donor CYP3A-status in liver transplant recipients. **Br J Clin Pharmacol 87**(4): 1790–1800.

Déri, M., Szakál-Tóth, Z., Fekete, F., Mangó, K., Incze, E., Minus, A., Merkely, B., Sax, B., & **Monostory, K.** (2021). CYP3A-status is associated with blood concentration and dose-requirement of tacrolimus in heart transplant recipients. **Sci Rep 11**(1): 21389.

Fekete, F., Mangó, K., Minus, A., Tóth, K., & **Monostory, K.** (2022). CYP1A2 mRNA Expression Rather than Genetic Variants Indicate Hepatic CYP1A2 Activity. **Pharmaceutics 14**(3), 532.

Fekete, F., Menus, Á., Tóth, K., Kiss, Á. F., Minus, A., Sirok, D., Belič, A., Póti, Á., Csukly, G., & **Monostory, K.** (2023). CYP1A2 expression rather than genotype is associated with olanzapine concentration in psychiatric patients. **Sci Rep 13**(1): 18507.

Széles, A., Schöll, K., Hirka, G., **Monostory, K.**, & Renkecz, T. (2025). Toxicokinetic Characterization of Isopropyl Glycidyl Ether in Rat by a Validated LC-APCI-MS/MS Method Using In-Source Derivatization. **Chem Res Toxicol 38**(3): 380–391.