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RESEARCH AREA

Tumors originating from the human adrenal cortex can be divided in two groups, adrenocortical adenomas (ACA) wich are more frequent but benign and adrenocortical carcinomas (ACC) with bad prognosis but luckily also less frequent. Differenciating these two tumor types is difficult even for an experienced pathologist from postoperative tissue samples. Our research group is looking for specific molecular markers, so called microRNAs, that could help in these differentiations. The expression of microRNAs is tissue specific (thus tumor specific). They also have a role in the regulation of gene expression so their role can be regarded either tumor driver or tumor supressor. MicroRNAs are stable, they are present in (tumor)tissues, in the blood, and in other body fluids. This gives us a possibility to exploit them as minimal invasive biomarkers in diagnostics. MicroRNAs are present in neuroendocrine tumors of the gastrointestinal tract. We plan to investigate the diagnostic possibilities of microRNA expression in pancreas neuroendocrine tumors (pNET) in this project.

TECHNIQUES AVAILABLE IN THE LAB

Nucleic acid isolation methods for DNA, RNA, microRNA from a variety of samples (human tissue, tumor tissue, FFPE, blood, diverse body fluids). Differential expression analysis of mRNAs and microRNAs with reverse transcription quantitative PCR (RT-QPCR) method, relative quantitation.

Mutation analysis by sequencing (Sanger), QPCR (SNP analysis) or Illumina NGS methods for large scale sequencing. Differential expression analysis via NGS: mRNA based transcriptomics (RNASEQ) and microRNA profiling (miRNA-SEQ).

SELECTED PUBLICATIONS

Turai P.I., Herold, Z., **Nyirő, G.**, Borka, K., Micsik, T., Tőke, J., Szücs, N., Tóth, M., Patócs, A., Igaz, P. (2022) Tissue miRNA Combinations for the Differential Diagnosis of Adrenocortical Carcinoma and Adenoma Established by Artificial Intelligence. **Cancers Basel 11; 14:** 895.

Olah, C., Hahnen, C., Nagy, N., Musial, J., Varadi, M., **Nyiro, G.**, Gyorffy, B., Hadaschik, B., Rawitzer, J., Ting, S., Sjödahl, G., Hoffmann, M.J., Reis, H., Szarvas, T. (2021) A quantitative polymerase chain reaction based method for molecular subtype classification of urinary bladder cancer-Stromal gene expressions show higher prognostic values than intrinsic tumor genes. **Int J Cancer 1;150:** 856-867.

Turai, P.I., **Nyírő, G.**, Butz, H., Patócs, A., Igaz, P. (2021) MicroRNAs, Long Non-Coding RNAs, and Circular RNAs: Potential Biomarkers and Therapeutic Targets in Pheochromocytoma/Paraganglioma. **Cancers Basel 26;13:** 1522.

Saskői, É., Hujber, Z., **Nyírő, G.**, Likó, I., Mátyási, B., Petővári, G., Mészáros, K., Kovács, A.L., Patthy, L., Supekar, S., Fan, H., Sváb, G., Tretter, L., Sarkar, A., Nazir, A., Sebestyén, A., Patócs, A., Mehta, A., Takács-Vellai, K. (2020) The SDHB Arg230His mutation causing familial paraganglioma alters glycolysis in a new Caenorhabditis elegans model. **Dis Model Mech. 15;13:** dmm044925.

Szalay, B., Tátrai, E., **Nyírő, G.**, Vezér, T., Dura, G. (2012) Potential toxic effects of iron oxide nanoparticles in in vivo and in vitro experiments. **J Appl Toxicol 32:** 446-53.