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RESEARCH AREA

My research focuses on the role of capsaicin-sensitive peptidergic sensory nerve endings, ion channels, receptors, and the sensory neuropeptides released from them, as well as neuro-immune interactions in different inflammatory diseases and chronic pain. Our research mainly involves DNA, RNA, protein-based, and cellular analyses of fresh surgical patient specimens, archived histological blocks, and in vitro cellular model systems.

Endometriosis is a severe gynecological condition associated with chronic pain and infertility. Many theories have been hypothesized to explain the background of the disease, but the exact pathomechanism of the disease is not known. The adhesions and chronic abdominal pain that develop negatively affect the quality of life of patients. In our work, we investigate potential intracellular (disease-specific signaling pathways) and cellular (migration, invasion, increased survival) processes that contribute to the formation of endometriotic lesions using surgical specimens and immortalized cell lines.

Hungary ranks first in Europe in terms of mortality from oral cancer. Anatomical localization, the difficulty of removing the tumor with a negative resection margin, and late diagnosis all contribute to the low survival rate. Vanilloid 1 and ankyrin 1 receptor, which are members of the Transient Receptor Ion Channels, have been hypothesized to play a role in some tumor types, and our group has demonstrated that they are functionally active in oral squamous cell carcinoma cells, but their exact role is unknown. Our main goals are to investigate the role of these receptors in this pathology using human tumor samples and the investigate the TRP-mediated effects of cigarette smoke both in human samples and and cell lines.

TECHNIQUES AVAILABLE IN THE LAB

DNA/RNA isolation from fresh tissue samples, cells, and archived tissue blocks, gene expression measurement by quantitative polymerase chain reaction, protein isolation, protein quantification (ELISA), immunohistochemistry, immunocytochemistry, cell culturing (mainly cell line), invasion assay, migration assay, proliferation assay, cell viability measurements

SELECTED PUBLICATIONS

Pohóczky, K., Kun, J., Szentés, N., Aczél, T., Urbán, P., Gyenesei, A., Bölcskei, K., Szőke, É., Sensi, S., Dénes, Á., Goebel, A., Tékus, V., Helyes, Z. (2022) Discovery of novel targets in a complex regional pain syndrome mouse model by transcriptomics: TNF and JAK-STAT pathways. **Pharmacol Res** **182**: 106347.

Kiss, F., **Pohóczky, K.**, Görbe, A., Dembrovszky, F., Kiss, S., Hegyi, P., Szakó, L., Tóth, L., Somogyiné Ezer, É., Szalai, E., Helyes, Z. (2022) Addition of EGFR inhibitors to standard chemotherapy increases survival of advanced head and neck squamous cell carcinoma patients: a systematic review and meta-analysis. **Oral dis** **29**: 1905-1919.

Kiss, F., Kormos, K., Szőke, É., Kecskés, A., Tóth, N., Steib, A., Szállási, Á., Scheich, B., Gaszner, B., Kun, J., Fülöp, G., **Pohóczky, K.**, Helyes, Z. (2021) Functional Transient Receptor Potential Ankyrin 1 and Vanilloid 1 Ion channels are overexpressed in human oral squamous cell carcinoma. **Int J Mol Sci** **23**: 1921.

Kecskés, A., **Pohóczky, K.**, Kecskés, M., Varga, V Z., Kormos, V., Szőke, É., Henn-Mike, N., Fehér, M., Kun, J., Gyenesei, A., Renner, É., Palkovits, M., Ferdinandy, P., Ábrahám, M I., Gaszner, B., Helyes, Z. (2020) Characterization of Neurons Expressing the Novel Analgesic Drug Target Somatostatin Receptor 4 in Mouse and Human Brains. **Int J Mol Sci** **21**: 7788.

Helyes, Z., Tékus, V., Szentés, N., **Pohóczky, K.**, Botz, B., Kiss, T., Kemény, Á., Környei, Z., Tóth, K., Lénárt, N., Ábrahám, H., Pinteaux, E., Francis, S., Sensi, S., Dénes, É., Goebel A. (2019) Transfer of complex regional pain syndrome to mice via human autoantibodies is mediated by interleukin-1-induced mechanisms. **Proc Natl Acad Sci U S A** **116**: 13067-13076.