ZOLTÁN WIENER

Semmelweis University
Department of Genetics, Cell- and Immunobiology

Address: Nagyvárad tér 4., H-1089 Budapest, Hungary

RESEARCH AREA

Colorectal cancer (CRC) is a leading cause of cancer-related death. Despite progress in the understanding of CRC, this disease remains a major health problem. The 5-year survival of patients with pancreatic ductal adenocarcinoma (PDAC) is extremely low, which has hardly improved in recent years. This can at least partially be attributed to the late diagnosis and the lack of early symptoms. Recent studies have shown that not only tumor cells, but also stromal cells (e.g. fibroblasts) significantly contribute to the progression of both CRC and PDAC and to bad patient survival. In the Molecular Oncobiology Research Group, we are focusing on the identification of new communication mechanisms between tumor cells and the stroma, which can form the basis of future therapeutic interventions for CRC and PDAC. One of our areas of interest is the function of extracellular vesicles (EV), representing a special form of membrane-bound cell-cell communication, and which can also be considered a molecular package. 3D organoids produced from patients play a central role in our studies. They are considered one of the most modern methods for modeling human tumors.

TECHNIQUES AVAILABLE IN THE LAB

Organoid technology, molecular biological methods (RNA, DNA and protein testing), extracellular vesicle analysis methods (Nanoparticle Tracking Analysis, EV isolation, etc.), confocal microscopy, fluorescence-based cell sorting, flow cytometry, genetic modification of organoids.

SELECTED PUBLICATIONS

Soós, AÁ., Kelemen, A., Orosz, A., Szvicsek, Z., Tölgyes, T., Dede, K., Bursics, A., **Wiener, Z.** (2023) High CD142 Level Marks Tumor-Promoting Fibroblasts with Targeting Potential in Colorectal Cancer. **Int J Mol Sci 24(14):** 11585.

Kelemen, A., Carmi, I., Oszvald, Á., Lőrincz, P., Petővári, G., Tölgyes, T., Dede, K., Bursics, A., Buzás, EI., **Wiener, Z.** (2021) IFITM1 expression determines extracellular vesicle uptake in colorectal cancer. **Cell Mol Life Sci 78(21-22):** 7009-7024.

Zeöld, A., Sándor, GO., Kiss, A., Soós, AÁ., Tölgyes, T., Bursics, A., Szűcs, Á., Harsányi, L., Kittel, Á., Gézsi, A., Buzás, EI., **Wiener, Z.** (2021) Shared extracellular vesicle miRNA profiles of matched ductal pancreatic adenocarcinoma organoids and blood plasma samples show the power of organoid technology. **Cell Mol Life Sci 78(6):** 3005-3020.

Oszvald, Á., Szvicsek, Z., Sándor, GO., Kelemen, A., Soós, AÁ., Pálóczi, K., Bursics, A., Dede, K., Tölgyes, T., Buzás, EI., Zeöld, A., **Wiener, Z.** (2020). Extracellular vesicles transmit epithelial growth factor activity in the intestinal stem cell niche. **Stem Cells.38(2):** 291-300.

Szvicsek, Z., Oszvald, Á., Szabó, L., Sándor, GO., Kelemen, A., Soós, AÁ., Pálóczi, K., Harsányi, L., Tölgyes, T., Dede, K., Bursics, A., Buzás, EI., Zeöld, A., **Wiener, Z.** (2019). Extracellular vesicle release from intestinal organoids is modulated by Apc mutation and other colorectal cancer progression factors. **Cell Mol Life Sci 76(12):** 2463-2476.

Wiener, Z., Band, AM., Kallio, P., Högström, J., Hyvönen, V., Kaijalainen, S., Ritvos, O., Haglund, C., Kruuna, O., Robine, S., Louvard, D., Ben-Neriah, Y., Alitalo, K. (2014). Oncogenic mutations in intestinal adenomas regulate Bim-mediated apoptosis induced by TGF-β. **Proc Natl Acad Sci U S A 111(21):** E2229-36.

Pribluda, A., Elyada, E., **Wiener, Z.**, Hamza, H., Goldstein, RE., Biton, M., Burstain, I., Morgenstern, Y., Brachya, G., Billauer, H., Biton, S., Snir-Alkalay, I., Vucic, D., Schlereth, K., Mernberger, M., Stiewe, T., Oren, M., Alitalo, K., Pikarsky, E., Ben-Neriah, Y.A. (2013). A senescence-inflammatory switch from cancer-inhibitory to cancer-promoting mechanism. **Cancer Cell 24(2):** 242-56.