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RESEARCH AREA

As the principal investigator of the Membrane Nanotube Networks Research Group, my research focuses on the formation and function of membrane nanotubes, which provide direct connections between cells. I primarily study the cytoskeletal composition of these communication structures and their roles in various intercellular transport processes, with particular emphasis on the transport and spread of certain organelles and laboratory-safe model pathogens. The involvement of membrane nanotubes has been proposed in several neurodegenerative diseases and cancerous conditions, and there is a growing effort to explore their therapeutic applications. Therefore, the biomedical relevance of these intercellular bridges - only a few hundred nanometres in diameter - is undeniable.

TECHNIQUES AVAILABLE IN THE LAB

Various molecular biology and biophysical techniques: sterile work in a BSL-2 laboratory, maintenance of cell cultures, cell and tissue labelling methods on live and fixed cells, inhibition and gene-silencing techniques, various transfection and electroporation methods, microscopic techniques (fluorescence, TIRF, laser-scanning confocal, super-resolution (SIM, STED), and electron microscopy), laser microdissection, expression and purification of recombinant proteins in an E. coli system when required, gel electrophoresis, as well as image and statistical analysis.

SELECTED PUBLICATIONS

Madarász, T., Nyitrai, M., **Szabó-Meleg, E.** (2024) Efficient purification of soluble receptor for advanced glycation end-products from Sus scrofa lung tissue and synthesis of its binding ligand, glycated bovine serum albumin. J Chromatogr **B Analyt Technol Biomed Life Sci 1247:** 124326.

Halász, H., Tárnai, V., Matkó, J., Nyitrai, M., **Szabó-Meleg, E.** (2024) Cooperation of Various Cytoskeletal Components Orchestrates Intercellular Spread of Mitochondria between B-Lymphoma Cells through Tunnelling Nanotubes. **Cells 13:** 607.

Madarász, T., Brunner, B., Halász, H., Telek, E., Matkó, J., Nyitrai, M., **Szabó-Meleg, E.** (2023) Molecular Relay Stations in Membrane Nanotubes: IRSp53 Involved in Actin-Based Force Generation. **Int J Mol Sci 24:** 13112.