

# ISTVÁN KRIZBAI



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## RESEARCH AREA

The central nervous system is one of the most complex and meantime the most sensitive part of our organism. For its proper function the central nervous system needs a steady state environment which is largely provided by the neurovascular unit. In this respect changes in functions of the neurovascular unit have important consequences in causing or aggravating a large number of neurological diseases. The main goal of our research is to understand the molecular mechanisms underlying the function of the neurovascular unit under physiological and pathological conditions. For this purpose, we use different *in vitro* models and *in vivo* two-photon microscopy. On the one side, we investigate the role of neurovascular unit in the formation of brain metastases and the mechanisms of migration of tumour cells into the brain. On the other hand, we investigate how cellular components of the neurovascular unit (brain endothelial cells, pericytes, astrocytes) communicate with each other in neurological disorders associated with aging and with inflammatory processes.

## TECHNIQUES AVAILABLE IN THE LAB

Isolation of different cell types from mammalian brain, cell culture, *in vitro* model systems including disease models, barrier permeability studies, biochemical and molecular biology methods, ELISA, fluorescence and confocal microscopy, *in vivo* two-photon and superresolution (STED) microscopy.

## SELECTED PUBLICATIONS

Haskó, J., Fazakas, C., Molnár, K., Mészáros, Á., Patai, R., Szabó, G., Erdélyi, F., Nyúl-Tóth, Á., Győri, F., Kozma, M., Farkas, A.E., **Krizbai, I.A.\***, Wilhelm, I.\*. (2019) Response of the neurovascular unit to brain metastatic breast cancer cells. **Acta Neuropathol Commun** 7: 133. \*corresponding authors

Wilhelm, I., Fazakas, C., Molnár, K., Végh, A.G., Haskó, J., **Krizbai, I.A.** (2018) Foe or friend? Janus- faces of the neurovascular unit in the formation of brain metastases. **J Cereb Blood Flow Metab** 38: 563-587.

Nyúl-Tóth, Á., Kozma, M., Nagyősz, P., Nagy, K., Fazakas, C., Haskó, J., Molnár, K., Farkas, A.E., Végh, A.G., Váró, G., Galajda, P., Wilhelm, I., **Krizbai, I.A.** (2017) Expression of pattern recognition receptors and activation of the non-canonical inflammasome pathway in brain pericytes. **Brain Behav Immun** 64: 220-231.

Nyúl-Tóth, Á., Suci, M., Molnár, J., Fazakas, C., Haskó, J., Herman, H., Farkas, A.E., Kaszaki, J., Hermenean, A., Wilhelm, I., **Krizbai, I.A.** (2016) Differences in the molecular structure of the blood-brain barrier in the cerebral cortex and white matter: an in silico, in vitro and ex vivo study. **Am J Physiol Heart Circ Physiol** 310: H1702-14.

Nagyősz, P., Nyúl-Tóth, Á., Fazakas, C., Wilhelm, I., Kozma, M., Molnár, J., Haskó, J., **Krizbai, I.A.** (2015) Regulation of NODlike receptors and inflammasome activation in cerebral endothelial cells. **J Neurochem** 135: 551-64.