ÁDÁM DÉNES

Institute of Experimental Medicine
Laboratory of Neuroimmunology

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RESEARCH AREA

Adam Denes is heading the Laboratory of Neuroimmunology and the Cell Biology Centre in the Institute of Experimental Medicine. His main interest is neuroinflammation and brain-immune interactions in health and disease. Their research explored the mechanisms through which inflammation inside or outside the central nervous system contributes to different forms of brain injury. They have also studied the pathways through which immune processes are controlled by the nervous system. His research group has revealed the role of microglia, the main immune cells of the brain in regulating neuronal activity and injury and the pivotal role of microglia in modulating cerebral blood flow.

TECHNIQUES AVAILABLE IN THE LAB

The Laboratory of Neuroimmunology uses a broad range of molecular anatomy approaches (confocal microscopy, superresolution microscopy, electron microscopy, electron tomography, array tomography), in vivo two-photon microscopy, laser speckle contrast imaging, functional ultrasound imaging, in vivo models of inflammation and microglial manipulation as well as different ex vivo and cell biology approaches (e.g. flow cytometry, primary neuronal and glial cultures).

SELECTED PUBLICATIONS

Császár, E., Lénárt, N., Cserép, C., Környei, Z., Fekete, R., Pósfai, B., Balázsfi, D., Hangya, B., Schwarcz, A.D., Szabadits, E., Szöllősi, D., Szigeti, K., Máthé, D., West, B.L., Sviatkó, K., Brás, A.R., Mariani, J.C., Kliewer, A., Lenkei, Z., Hricisák, L., Benyó, Z., Baranyi, M., Sperlágh, B., Menyhárt, Á., Farkas, E., **Dénes, Á.** (2022) Microglia modulate blood flow, neurovascular coupling, and hypoperfusion via purinergic actions. **J Exp Med 219:** e20211071.

Cserép, C., Pósfai, B., **Dénes, Á.** (2021). Shaping neuronal fate: functional heterogeneity of direct microglia-neuron interactions. **Neuron 109:** 222-240.

Cserép, C., Pósfai, B., Lénárt, N., Fekete, R., László, Z.I., Lele, Z., Orsolits, B., Molnár, G., Heindl, S., Schwarcz, A.D., Ujvári, K., Környei, Z., Tóth, K., Szabadits, E., Sperlágh, B., Baranyi, M., Csiba, L., Hortobágyi, T., Maglóczky, Z., Martinecz, B., Szabó, G., Erdélyi, F., Szipőcs, R., Tamkun, M.M., Gesierich, B., Duering, M., Katona, I., Liesz, A., Tamás, G., **Dénes, Á.** (2020) Microglia monitor and protect neuronal function via specialized somatic purinergic junctions. **Science 367:** 528-537.

Fekete, R., Cserép, C., Lénárt, N., Tóth, K., Orsolits, B., Martinecz, B., Méhes, E., Szabó, B., Németh, V., Gönci, B., Sperlágh, B., Boldogkői, Z., Kittel, Á., Baranyi, M., Ferenczi, S., Kovács, K., Szalay, G., Rózsa, B., Webb, C., Kovacs, G.G., Hortobágyi, T., West, B.L., Környei, Z., **Dénes, Á.** (2018) Microglia control the spread of neurotropic virus infection via P2Y12 signalling and recruit monocytes through P2Y12-independent mechanisms. **Acta Neuropathol 136:** 461-482.

Szalay, G., Martinecz, B., Lénárt, N., Környei, Z., Orsolits, B., Judák, L., Császár, E., Fekete, R., West, B.L., Katona, G., Rózsa, B., **Dénes, Á.** (2016) Microglia protect against brain injury and their selective elimination dysregulates neuronal network activity after stroke. **Nat Commun 7:** 11499.