



Research topic – Neurobiology of Disease

Our objective is to determine the neuronal mechanisms of depression, epilepsy, Alzheimer disease, and mitochondrial diseases at the cellular as well as the molecular level.

Recent publications in the topic:

Barna J, Dimén D, Puska G, Kovács D, Csikós V, Oláh S, Udvari EB, Pál G, **Dobolyi A** (2019) Complement component 1q subcomponent binding protein in the brain of the rat. *Scientific Reports*. 9:4597. doi: 10.1038/s41598-019-40788-z.

Chinopoulos C, Batzios S, van den Heuvel LP, Rodenburg R, Smeets R, Waterham HR, Turkenburg M, Ruiten JP, Wanders RJA, Doczi J, Horvath G, **Dobolyi A**, Vargiami E, Wevers RA, Zafeiriou D. (2019) Mutated SUCLG1 causes mislocation of SUCLG2 protein, morphological alterations of mitochondria and an early-onset severe neurometabolic disorder. *Mol Genet Metab*. 126:43-52. doi: 10.1016/j.ymgme.2018.11.009.

Abraham D, Feher J, Scuderi GL, Szabo D, **Dobolyi A**, Cservenak M, Juhasz J, Ligeti B, Pongor S, Gomez-Cabrera MC, Vina J, Higuchi M, Suzuki K, Boldogh I, Radak Z (2019) Exercise and probiotics attenuate the development of Alzheimer's disease in transgenic mice: Role of microbiome. *Exp Gerontol*. 115:122-131. doi: 10.1016/j.exger.2018.12.005.

Völgyi K, Gulyácssy P, Todorov MI, Puska G, Badics K, Hlatky D, Kékesi KA, Nyitrai G, Czurkó A, Drahos L, **Dobolyi A**. (2018) Chronic cerebral hypoperfusion induced synaptic proteome changes in the rat cerebral cortex. *Mol Neurobiol*. 55:4253-4266. doi: 10.1007/s12035-017-0641-0.

Lakatos RK, **Dobolyi A**, Kovács Z. (2018) Uric acid and allopurinol aggravate absence epileptic activity in Wistar Albino Glaxo Rijswijk rats. *Brain Res*. 1686:1-9. doi: 10.1016/j.brainres.2018.02.012.

Kovacs Z, D'Agostino DP, **Dobolyi A**, Ari C. (2017) Adenosine A1 receptor antagonism abolished the anti-seizure effects of exogenous ketone supplementation in Wistar albino Glaxi Rijswijk rats. *Front Mol Neurosci*. 10:235. doi: 10.3389/fnmol.2017.00235.

Völgyi K., Hádén K., Kis V., Gulyácssy P., Badics K., Györffy B.A., Simor A., Szabó Z., Janáky T., Drahos L., **Dobolyi A.**, Penke B., Juhász G., Kékesi K.A. (2017) Mitochondrial Proteome Changes Correlating with β -Amyloid Accumulation. *Mol Neurobiol*. 54:2060-2078. doi: 10.1007/s12035-015-9682-4.

Lakatos RK, **Dobolyi A**, Todorov MI, Kékesi KA, Juhász G, Aleksza M, Kovács Z. (2016) Guanosine may increase absence epileptic activity by means of A2A adenosine receptors in

Wistar Albino Glaxo Rijswijk rats. *Brain Res Bull.* 124:172-181. doi: 10.1016/j.brainresbull.2016.05.001.

Györfly B.A., Gulyácssy P., Gellén B., Völgyi K., Madarasi D., Kis V., Ozohanics O., Papp I., Kovács P., Lubec G., **Dobolyi A.**, Kardos J., Drahos L., Juhász G., Kékesi K.A. (2016) Widespread alterations in the synaptic proteome of the adolescent cerebral cortex following prenatal immune activation in rats. *Brain Behav Immun.* 56:289-309. doi: 10.1016/j.bbi.2016.04.002.

Nardai S., **Dobolyi A.**, Skopal J., Lakatos K., Merkely B., Nagy Z. (2016) Delayed Gelatinase Inhibition Induces Reticulon 4 Receptor Expression in the Peri-Infarct Cortex. *Journal of NeuroPath Exp Neur.* 75:379-85. doi: 10.1093/jnen/nlw011.

Völgyi K., Gulyácssy P., Háden K., Badics K., Kis V., Kékesi K.A., Simor A., Györfly B., Tóth E.A., Lubec G., Juhász G., **Dobolyi A.** (2015) Synaptic mitochondria: A brain mitochondria cluster with a specific proteome. *J. Proteomics.* 120:142-157.

Dobolyi A., Ostergaard E., Bagó A.G., Dóczi T., Palkovits M., Gál A., Molnár M.J., Ádám-Vizi V., Chinopoulos C. (2015) Exclusive neuronal expression of SUCLA2 in the human brain. *Brain Struct. Funct.* 220:135-151.

Romanov R.A., Alpár A., Zhang M.D., Zeisel A., Calas A., Landry M., Fuszard M., Shirran S.L., Schnell R., **Dobolyi A.**, Oláh M., Spence L., Mulder J., Martens H., Palkovits M., Uhlen M., Sitte H.H., Botting C.H., Wagner L., Linnarsson S., Hökfelt T., Harkany T. (2015) A secretagogue locus of the mammalian hypothalamus controls stress hormone release. *EMBO J.* 34:36-54.

Kovács Z., Kékesi K.A., **Dobolyi A.**, Lakatos R., Juhász G. (2015) Absence epileptic activity changing effects of non-adenosine nucleoside inosine, guanosine and uridine in Wistar Albino Glaxo Rijswijk rats. *Neuroscience* 300:593-608.

Nardai S., **Dobolyi A.**, Pál G., Skopál J., Pintér N., Lakatos K., Merkely B., Nagy Z (2015) Selegiline promotes NOTCH_JAGGED signaling in astrocytes of the peri-infarct region and improves the functional integrity of the neurovascular unit in a rat model of focal ischemia. *Restor. Neurol. Neurosci.* 33:1-14.

Dobolyi A., Bagó A.G., Gál A., Molnár M.J., Palkovits M., Adam-Vizi V., Chinopoulos C. (2015) Localization of SUCLA2 and SUCLG2 subunits of succinyl CoA ligase within the cerebral cortex suggests the absence of matrix substrate-level phosphorylation in glial cells of the human brain. *J. Bioenerg. Biomembr.* 47:33-41.