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Pharmacology & Neuroscience
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Area of Expertise

Glaucoma is an eye disease commonly associated with an increase in intraocular pressure, afflicting nearly 3 million Americans and 70 million people world-wide. Current therapies are aimed at lowering intraocular pressure, however, damage to the optic nerve continues to occur despite these treatments. There is a pressing need for adjunct therapies aimed at protecting the optic nerve from further damage.

My laboratory research focuses on the development of strategies for neuroprotection in glaucoma. Specifically, we are testing various small molecules and adeno-associated viral gene therapies for their ability to attenuate neurodegeneration in animal models of glaucoma. We also aim to unravel cellular and molecular mechanisms underlying the pathophysiology of glaucoma.

Concepts/techniques: We carry out these studies using in vitro rat primary retinal ganglion cell cultures, ex vivo adult rat retinal explants, and various in vivo rodent models of glaucoma. We use visual function tests including pattern ERG and optomotor test to determine the efficacy of clinically relevant experimental pharmacotherapies.

Our ongoing studies have the potential to develop novel therapeutic agents for neuroprotection in glaucoma.

Qualifications

MS in Biochemistry & Genetics, University of Łódź

PhD in Microbiology, University of Łódź

Recent Publications

Nanoencapsulated hybrid compound SA-2 with long-lasting intraocular pressure-lowering activity in rodent eyes

Stankowska, D. L., Millar, J. C., Kodati, B., Behera, S., Chaphalkar, R. M., Nguyen, T., Nguyen, K. T., Krishnamoorthy, R. R., Ellis, D. Z. & Acharya, S., 2021, In: Molecular vision. 27, p. 37-49 13 p.

Endothelin-1 Mediated Decrease in Mitochondrial Gene Expression and Bioenergetics Contribute to Neurodegeneration of Retinal Ganglion Cells

Chaphalkar, R. M., Stankowska, D. L., He, S., Kodati, B., Phillips, N., Prah, J., Yang, S. & Krishnamoorthy, R. R., 1 Dec 2020, In: Scientific Reports. 10, 1, 3571.

Kynurenic acid protects against ischemia/reperfusion-induced retinal ganglion cell death in mice

Nahomi, R. B., Nam, M. H., Rankenberg, J., Rakete, S., Houck, J. A., Johnson, G. C., Stankowska, D. L., Pantcheva, M. B., Maclean, P. S. & Nagaraj, R. H., 1 Mar 2020, In: International journal of molecular sciences. 21, 5, 1795.

Correction: Systemically administered peptain-1 inhibits retinal ganglion cell death in animal models: implications for neuroprotection in glaucoma (Cell Death Discovery, (2019), 5, 1, (112), 10.1038/s41420-019-0194-2)

Stankowska, D. L., Nam, M. H., Nahomi, R. B., Chaphalkar, R. M., Nandi, S. K., Fudala, R., Krishnamoorthy, R. R. & Nagaraj, R. H., 1 Dec 2019, In: Cell Death Discovery. 5, 1, 122.

Erratum: Hybrid compound SA-2 is neuroprotective in animal models of retinal ganglion cell death (Investigative Ophthalmology and Visual Science (2019) 60 (3064–3073) DOI: 10.1167/iops.18-25999)

Stankowska, D. L., Dibas, A., Li, L., Zhang, W., Krishnamoorthy, V. R., Chavala, S. H., Nguyen, T. P., Yorio, T., Ellis, D. Z. & Acharya, S., 1 Sep 2019, In: Investigative Ophthalmology and Visual Science. 60, 12, p. 3717 1 p.

Hybrid compound sa-2 is neuroprotective in animal models of retinal ganglion cell death

Stankowska, D. L., Dibas, A., Li, L., Zhang, W., Krishnamoorthy, V. R., Chavala, S. H., Nguyen, T. P., Yorio, T., Ellis, D. Z. & Acharya, S., Jul 2019, In: Investigative Ophthalmology and Visual Science. 60, 8, p. 3064-3073 10 p.

Systemically administered peptain-1 inhibits retinal ganglion cell death in animal models: Implications for neuroprotection in glaucoma

Stankowska, D. L., Nam, M. H., Nahomi, R. B., Chaphalkar, R. M., Nandi, S. K., Fudala, R., Krishnamoorthy, R. R. & Nagaraj, R. H., 2019, In: Cell Death Discovery. 5, 1, 112.

Neuroprotective effects of inhibitors of Acid-Sensing ion channels (ASICs) in optic nerve crush model in rodents

Stankowska, D. L., Mueller, B. H., Oku, H., Ikeda, T. & Dibas, A., 2 Jan 2018, In: Current Eye Research. 43, 1, p. 84-95 12 p.

Targets of neuroprotection in glaucoma

He, S., Stankowska, D. L., Ellis, D. Z., Krishnamoorthy, R. R. & Yorio, T., 1 Jan 2018, In: Journal of Ocular Pharmacology and Therapeutics. 34, 1-2, p. 85-106 22 p.

Neuroprotective effects of curcumin on endothelin-1 mediated cell death in hippocampal neurons

Stankowska, D. L., Krishnamoorthy, V. R., Ellis, D. Z. & Krishnamoorthy, R. R., 28 May 2017, In: Nutritional Neuroscience. 20, 5, p. 273-283 11 p.

Sponsored Projects

Bi-functional Molecule for Glaucomatous Optic Neuropathy

Acharya, S. & Stankowska, D.
BrightFocus Foundation
1/07/18 → 30/06/20

Mechanisms Underlying Endothelin Mediated Neurodegeneration in Glaucoma

Krishnamoorthy, R., He, S. & Stankowska, D.
NEI: National Eye Institute
1/09/17 → 31/08/20

Neuroprotective Targets of Transcription Factor Brn3b

Stankowska, D.
Fight for Sight
1/10/16 → 31/05/18

Neuroprotective targets of transcription factor Brn3b (For: Alexis Seibert)

Stankowska, D.
Intramural Research(UNTHSC)
5/06/17 → 31/05/18

Novel hybrid molecule with both IOP lowering and neuroprotective effects for treatment of glaucoma

Stankowska, D. & ACHARYA, S.
1/09/20 → 31/08/21

Novel Multi-pulse Pumping with Time-gated Detection Technology for Study Dynamics of Molecular Assemblies

Fudala, R. & Stankowska, D.
Intramural Research(UNTHSC)
1/06/17 → 31/05/18

UNTHSC Stkwska 08/17

Stankowska, D.
Intramural Research(UNTHSC)
1/05/16 → 31/08/17