

COMPLETE LIST OF PUBLICATIONS

13.9.2021

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1. Original research articles

1. **Myöhänen TT**, Venäläinen JI, Tupala E, Garcia-Horsman JA, Miettinen R, Männistö PT: Distribution of immunoreactive prolyl oligopeptidase in the rat brain. *Neurochemical Research* 32:1365-1374, 2007
2. **Myöhänen TT**, Venäläinen JI, Garcia-Horsman JA, Piltonen M, Männistö PT: Cellular and subcellular distribution of rat brain prolyl oligopeptidase and its association with specific neuronal neurotransmitters. *Journal of Comparative Neurology* 507: 1694-1708, 2008
3. **Myöhänen TT**, Venäläinen JI, Garcia-Horsman JA, Männistö PT: Spatial association of prolyl oligopeptidase, inositol 1,4,5-triphosphate type 1 receptor, substance P and its NK-1 receptor in the rat brain: An immunohistochemical study. *Neuroscience* 153: 1177-1189, 2008
4. **Myöhänen TT**, Venäläinen JI, Garcia-Horsman JA, Piltonen M, Männistö PT: Distribution of prolyl oligopeptidase in mouse whole-body and peripheral tissues. *Histochemistry and Cell Biology* 130: 993-1003, 2008
5. **Myöhänen TT**, Kääriäinen TM, Jalkanen AJ, Piltonen M, Männistö PT: Prolyl oligopeptidase in the reciprocal connections between thalamus and cortex: A retrograde neurotracing study. *Neuroscience Letters* 450: 201-205, 2009
6. Käenmäki M, Tammimäki A, Garcia-Horsman JA, **Myöhänen TT**, Schendzielorz N, Karayiorgou M, Gogos J, Männistö PT: Importance of the two forms of catechol-O-methyltransferase (COMT) in L-dopa metabolism: a pharmacokinetic study in two types of *Comt* gene modified mice. *British Journal of Pharmacology* 158: 1884-1894, 2009
7. **Myöhänen TT**, Schendzielorz N, Männistö PT: Distribution of immunoreactive catechol-O-methyltransferase (COMT) and its enzyme activities in wild-type and soluble-COMT deficient mouse. *Journal of Neurochemistry* 113: 1632-1643, 2010
8. Käenmäki M, Tammimäki A, **Myöhänen TT**, Pakarinen K, Amberg C, Karayiorgou M, Gogos J, Männistö PT: Quantitative role of COMT in dopamine clearance in the prefrontal cortex of freely moving mice. *Journal of Neurochemistry* 114: 1745-55, 2010.
9. Peltonen I, **Myöhänen TT**, Männistö PT: Association of prolyl oligopeptidase and conventional neurotransmitters in the brain. *CNS & Neurological Disorders – Drug Targets* 10: 311-318, 2011
10. Hannula M, Männistö PT, **Myöhänen TT**: Sequential expression, activity and nuclear localization of prolyl oligopeptidase in the developing rat brain. *Developmental Neuroscience* 33: 38-47, 2011

11. Myöhänen TT, Tenorio-Laranga J, Jokinen B, Moreno-Baylach MJ, Vasques R, Garcia-Horsman JA, Männistö PT: Prolyl oligopeptidase (POP) induces angiogenesis both *in vitro* and *in vivo* in a novel regulatory manner. *British Journal of Pharmacology* 163: 1666-78, 2011. doi: 10.1111/j.1476-5381.2010.01146.x.
12. Piltonen M, Planken A, Leskelä O, Myöhänen TT, Hänninen AL, Auvinen P, Alitalo K, Andressoo JO, Saarma M, Männistö PT: Vascular endothelial growth factor C (VEGF-C) acts as a neurotrophic factor for dopamine neurons *in vitro* and *in vivo*. *Neuroscience* 192: 550-563, 2011
13. Myöhänen TT, Hannula MJ, Van Elzen R, Gerard M, Van Der Veken P, Baekelandt V, Garcia-Horsman JA, Männistö PT, Lambeir AM: The prolyl oligopeptidase inhibitor, KYP-2047, reduces α -synuclein protein levels and aggregates in cellular and animal models of Parkinson's disease. *British Journal of Pharmacology*, 166: 1097-113, 2012. doi: 10.1111/j.1476-5381.2012.01846.x.
14. Peltonen I, Myöhänen TT, Männistö PT: Interaction of prolyl oligopeptidase and neurotensin in dopaminergic function of the rat nigrostriatal and mesolimbic pathways. *Neurochemical Research* 37:2033-2041, 2012
15. Myöhänen TT, Pyykkö E, Männistö PT, Carpen O: The distribution of prolyl oligopeptidase in human peripheral tissues and in ovarian and colorectal tumors. *Journal of Histochemistry and Cytochemistry* 60: 706-715, 2012
16. Piltonen M, Savolainen MH, Patrikainen S, Baekelandt V, Myöhänen TT, Männistö PT: Comparison of motor performance, brain biochemistry and histology of two mouse lines carrying different α -synuclein mutations. *Neuroscience* 231: 157-168, 2013
17. Schendzielorz N, Oinas J-P, Myöhänen TT, Reenilä I, Raasmaja A, Männistö PT: Catechol-O-methyltransferase (COMT) protein expression and activity after dopaminergic and noradrenergic lesions of the rat brain. *Plos One* 8:e61392, 2013
18. Hannula MJ, Myöhänen TT, Tenorio-Laranga J, Männistö PT, Garcia-Horsman JA: Prolyl oligopeptidase colocalizes with α -synuclein, β -amyloid, tau protein and astroglia in the post-mortem brain samples with Parkinson's and Alzheimer's diseases. *Neuroscience* 242:140-150, 2013
19. Y, Chun B, Potthoff SA, Kazi N, Brolin TJ, Orhan D, Yang HC, Kon V, Myöhänen TT, Rhaleb NE, Carrasco OA, Kleinman HK, Fogo AB: Thymosin β 4 and Ac-SDKP, Novel Reparative Factors in Renal Fibrosis. *Kidney International* 84:1166-1175, 2013
20. Savolainen MH, Richie C, Harvey BK, Männistö PT, Maguire-Zeiss KA, Myöhänen TT: The beneficial effect of a prolyl oligopeptidase inhibitor, KYP-2047, on alpha-synuclein clearance and autophagy in A30P transgenic mouse. *Neurobiology of Disease* 68C:1-15, 2014
21. Vihko P, Nousiainen HO, Myöhänen TT, Voikar V, Quintero I, Mijatovic J, Segerstråle M, Herrala AK, Kulesskaya N, Pulkka A, Kivinummi T, Ramadan UA, Taira T, Piepponen TP, Rauvala H: Mice deficient of Prostatic Acid Phosphatase displays multiple hallmarks of schizophrenia. *PlosOne* 9(5):e97851, 2014

22. Kim JD, Toda C, Liu ZW, D'Agostino G, Zeiss C, DiLeone R, Kibbey RG, Chan O, Harvey BK, Richie C, Savolainen MH, **Myöhänen TT**, Jeong JK, Diano S: Hypothalamic Prolyl Endopeptidase (PREP) regulates pancreatic insulin and glucagon secretion in mice. *PNAS* 111:11876-11881, 2014
23. Ahonen L, Maire F, Savolainen M, Kopra J, Vreeken RJ, Hankemeier T, **Myöhänen TT**, Kylli P, Kostiainen R: Analysis of oxysterols and vitamin D metabolites in mouse brain and cell line samples by ultra performance liquid chromatography-atmospheric pressure photoionization-mass spectrometry. *Journal of Chromatography A* 1364:214-22, 2014
24. Dokleja L, Hannula MH, **Myöhänen TT**: Prolyl oligopeptidase inhibition attenuates the effect of rotenone on α -synuclein aggregation and cell death on α -synuclein overexpressing cells. *Neuroscience Letters* 538C:37-42, 2014
25. Savolainen MH, Yan X, **Myöhänen TT**, Huttunen H,: Prolyl oligopeptidase enhances α -synuclein dimerization via direct protein-protein interaction. *Journal of Biological Chemistry* 290: 5117-5126, 2015
26. Svarcbahs R, Julku UH, **Myöhänen TT**: Inhibition of Prolyl Oligopeptidase restores spontaneous motor behavior in alpha-synuclein virus vector based Parkinson's disease mouse model by decreasing alpha-synuclein oligomeric species in mouse brain. *Journal of Neuroscience* 36: 12485-12497, 2016
27. **Myöhänen TT**, Norrbacka S, Savolainen MH: Prolyl oligopeptidase inhibition attenuates the toxicity of a proteasomal inhibitor, lactacystin, in the alpha-synuclein overexpressing cell culture. *Neuroscience Letters* 636: 83-89, 2017
28. Savolainen MH, Albert K, Airavaara M, **Myöhänen TT**: Nigral injection of a proteasomal inhibitor, lactacystin, induces wide-spread glial cell activation and shows various phenotypes of Parkinson's disease in young and adult mouse. *Experimental Brain Research* 235: 2189-2202, 2017
29. Svarcbahs R, Julku UH, Norrbacka S, **Myöhänen TT**: Removal of Prolyl Oligopeptidase Attenuates the Toxicity of Alpha-Synuclein in Cells and In Vivo. *Scientific Reports* 8: 1552, 2018
30. Kopra J, Villarta-Aguilera M, Savolainen M, **Myöhänen TT**, Rannanpää S, Salvatore MF, Saarma M, Anderssoo JO, Piepponen P: Constitutive Ret signalling leads to longer expression of amphetamine-induced place conditioning via elevation of mesolimbic dopamine. *Neuropharmacology* 128: 221-230, 2018
31. Julku UH, Panhelainen A, Tiilkainen S, Svarcbahs R, Tammimäki A, Piepponen TP, Savolainen MH, **Myöhänen TT**: Prolyl oligopeptidase regulates dopamine transporters in nigrostriatal tract in mice. *Molecular Neurobiology* 55: 470-482, 2018
32. Norrbacka S, Lindholm D, **Myöhänen TT**: Prolyl oligopeptidase inhibition attenuates lactacystin toxicity in cellular model of Huntington's disease. *Journal of Cellular and Molecular Medicine* 23: 8511-8515, 2019

33. Kilpeläinen T, Julku U, Svarcbahs R, **Myöhänen TT**: Re-characterization of Behavioural and dopaminergic changes in double mutated human A30P*A53T alpha-synuclein transgenic mouse model of Parkinson's disease. *Scientific Reports* 9: 1738, 2019
34. Kilpeläinen T, Tyni JK, Lahtela-Kakkonen MK, Eteläinen T, **Myöhänen TT**, Wallen EAA: The effect of 4-phenylbutanoyl-aminoacyl-2(S)-tetrazolylpyrrolidines on the functions of prolyl oligopeptidase. *ACS Medicinal Chemical Letters* 10: 1635-1640, 2019
35. Serfozo P, Wysocki J, Gulua G, Ye M, Liu P, Jin J, Bader M, **Myöhänen T**, García-Horsman JA, Batlle D: Angiotensin II Conversion to Angiotensin (1-7) in the circulation is Prolyl Endopeptidase-Dependent and Angiotensin Converting Enzyme 2-Independent. *Hypertension* 75:173-182, 2020
36. Svarcbahs R, Jäntti M, Kilpeläinen T, Julku U, Urvas L, Kivioja S, Norrbacka S, **Myöhänen TT**: Prolyl oligopeptidase inhibition activates protein phosphatase 2A. *Pharmacological Research* 151: 104558., 2020
37. Kilpeläinen T, Hellinen L, Vrijdag J, Yan X, Svarcbahs R, Vellonen KS, Lambeir AM, Huttunen H, Urtti A, , Wallen EAA, **Myöhänen TT**: The effect of prolyl oligopeptidase inhibitors on alpha-synuclein aggregation and autophagy cannot be predicted by their inhibitory efficacy. *Biomedicine & Pharmacotherapy* 128: 110253, 2020
38. Rostami J, Jäntti M, Cui H, Rinne MK, Kukkonen JP, Falk A, Erlandsson A, **Myöhänen T**. Prolyl oligopeptidase inhibition by KYP-2047 increases alpha-synuclein fibril degradation in neuron-like cells. *Biomedicine & Pharmacotherapy* 133:111019, 2021
39. Julku U, Jäntti M, Svarcbahs R, **Myöhänen TT**: Prolyl oligopeptidase regulates dopamine transporter phosphorylation by PKC and ERK independent manner. *International Journal of Molecular Sciences* 22:1777, 2021
40. Klionsky DJ...**Myöhänen TT**... Zhuang X, Zong WX: Guidelines for the Use and Interpretation of Assays for Monitoring Autophagy (4th edition). *Autophagy* 17:1-382, 2021
41. Eteläinen T, Kulmala V, Jäntti M, **Myöhänen TT**: Prolyl Oligopeptidase Inhibition Reduces Oxidative Stress via Reducing NADPH Oxidase Activity by Activating Protein Phosphatase 2A. *Free Radical Biology & Medicine* 169:14-23, 2021
42. **Myöhänen TT**, Merten F, Norrbacka S, Cui H: Deletion or inhibition of prolyl oligopeptidase blocks molecular effects of lithium by activation of protein phosphatase 2A. *Basic & Clinical Pharmacology & Toxicology* 29:287-296, 2021
43. Cui H, Kilpeläinen T, Zouzoula L, Auno S, Trontti K, Kurvonen S, Norrbacka S, Hovatta I, Jensen PH, **Myöhänen TT**: Prolyl oligopeptidase inhibition reduces alpha-synuclein aggregation in a cellular model of multiple system atrophy. *Journal of Cellular and Molecular Medicine*. doi: 10.1111/jcmm.16910, 2021
44. Heininen J, Vaikkinen A, Julku U, **Myöhänen TT**, Kotiaho T, Kostiainen R: Quantitative multiplexed analysis of amino acids in mice brain microdialysis samples using isobaric labelling and liquid chromatography-high resolution tandem mass spectrometry. *Journal of Chromatography A*. doi.org: 10.1016/j.chroma.2021.462537, 2021

45. Pätsi H, Kilpeläinen T, Auno, S, Dillemuth P, Arja K, Lahtela-Kakkonen M, **Myöhänen TT**, Wallén E: Imidazole as a substitute for the electrophilic group gives highly potent prolyl oligopeptidase inhibitors with a new putative binding mode. *ACS Medicinal Chemistry Letters*. DOI: 10.1021/acsmedchemlett.1c00399, 2021

Peer-reviewed review articles in international journals

46. **Myöhänen TT**, Garcia-Horsman JA, Tenorio-Laranga J, Männistö PT: Issues about the physiological functions of prolyl oligopeptidase based on its discordant spatial association with substrates and inconsistencies among mRNA, protein levels, and enzymatic activity. *Journal of Histochemistry and Cytochemistry* 57: 831-849, 2009. *Review*.
47. **Myöhänen TT** & Männistö PT: Distribution and functions of COMT proteins: do recent findings change the picture (Chapter 3). *International Reviews of Neurobiology* 95: 29-47, 2010. *Review*.
48. Svarcbahs R, Julku UH, Kilpeläinen T, Kyrrö M, Jäntti M, **Myöhänen TT**: New tricks of prolyl oligopeptidase inhibitors -a common drug therapy for several neurodegenerative diseases. *Biochemical Pharmacology* 161:113-120, 2019. *Review*.

2. Peer-reviewed scientific articles in national journals

49. **Myöhänen TT**: Prolyylioligopeptidaasin estäjällä Parkinsonin tautia vastaan. *Duodecim* 133:89, 2017 (A journal of The Finnish Medical Society Duodecim, article in Finnish)
50. **Myöhänen TT** & Kursula P: Entsyymien merkitys hermoja rappetuttavissa sairauksissa. *Duodecim*, 135:745-52, 2019 (A journal of The Finnish Medical Society Duodecim, article in Finnish)