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PUBLICATIONS

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PEER-REVIEWED SCIENTIFIC ARTICLES

1. Mysore Y., Hytti M., Deen AJ., Ranta-aho S., Piippo N., Toppila M., Loukovaara S., **Kauppinen A**. (2024) Epithelial-mesenchymal transition (EMT) and the effect of atorvastatin on it in ARPE-19 cells. Cell Biochem Biophys. doi: 10.1007/s12013-024-01305-w. In Press

2. Salminen A., Kaarniranta K., **Kauppinen A.** (2024) Tissue fibroblasts are versatile immune regulators: An evaluation of their impact on the aging process. *Ageing Res Rev*, 97: 102296. doi: 10.1016/j.arr.2024.102296

3. Harju N., Hytti M., Kolari O., Nisula H., Loukovaara S., **Kauppinen A**. (2024) Anti-inflammatory potential of simvastatin and amfenac in ARPE-19 cells; insights in preventing re-detachment and proliferative vitreoretinopathy after rhegmatogenous retinal detachment surgery. *Int Ophthalmol*, 44(1): 158. doi: 10.1007/s10792-024-03067-z

4. Korhonen E., Piippo N., Hytti M., Kaarniranta K., **Kauppinen A.** (2023) Cis-urocanic acid improves cell viability and suppresses inflammasome activation in human retinal pigment epithelial cells. *Biochem Pharmacol*, 216: 115790. doi: 10.1016/j.bcp.2023.115790

5. Toppila M., Hytti M., Korhonen E., Ranta-aho S., Harju N., Forsberg MM., Kaarniranta K., Jalkanen A., **Kauppinen A.** (2023) The prolyl oligopeptidase inhibitor KYP-2047 is cytoprotective and anti-inflammatory in human retinal pigment epithelial cells and defective proteasomal clearance. *Antioxidants (Basel)*, 12(6): 1279. doi: 10.3390/antiox12061279

6. Karema-Jokinen V., Koskela A., Hytti M., Hongisto H., Viheriälä T., Liukkonen M., Torsti T., Skottman H., **Kauppinen A.**, Nymark S., Kaarniranta K. (2023) Crostalk of protein clearance, inflammasome, and Ca2+ channels in retinal pigment epithelium derived from age-related macular degeneration patients. *J Biol Chem*, 299(6): 104770. doi: 10.1016/j.jbc.2023.104770

7. Hytti M., Ruuth J., Kanerva I., Bhattarai N., Pedersen ML., Nielsen CU., **Kauppinen A.** (2023) Phloretin inhibits glucose transport and reduces inflammation in human retinal pigment epithelial cells. *Mol Cell Biochem*, 478(1): 215-227. doi: 10.1007/s11010-022-04504-2

8. Leinonen H., Zhou TE, Ballios BG, **Kauppinen A.**, Fu Z. (2022) Editorial: Regulation of inflammation and metabolism in retinal neurodegenerative disorders. *Front Neurosci*, 16: 1102385. doi: 10.3389/fnins.2022.1102385

9. Tampio J., Markowicz-Piasecka M., Montaser A., Rysä J., **Kauppinen A.**, Huttunen KM. (2022) L-type amino acid transporter 1 utilizing ferulic acid derivatives show increased drug delivery in the mouse pancreas along with decreased lipid peroxidation and prostaglandin production. *Mol Pharm*, 9(11): 3806-3819. doi: 10.1021/acs.molpharmaceut.2c00328

10. Sridevi Gurubaran I., Hytti M., Kaarniranta K., **Kauppinen A.** (2022) Epoxomicin, a selective proteasome inhibitor, activates AIM2 inflammasome in human retinal pigment epithelium cells. *Antioxidants (Basel)*, 11(7): 1288. doi: 10.3390/antiox11071288

11. Salminen A., Kaarniranta K., **Kauppinen A.** (2022) Photoaging: UV radiation-induced inflammation and immunosuppression accelerate the aging process in the skin. *Inflamm Res*, 71(7-8): 817-831. doi: 10.1007/s00011-022-01598-8

12. Bhattarai N., Hytti M., Reinisalo M., Kaarniranta K., Mysore Y., **Kauppinen A.** (2022) Hydroquinone predisposes for retinal pigment epithelial (RPE) cell degeneration in inflammatory conditions. *Immunol Res*, 70(5): 678-687. doi: 10.1007/s12026-022-09300-0

13. Salminen A., Kaarniranta K., **Kauppinen A.** (2021) Hypoxia/ischemia impairs CD33 (Siglec3)/TREM2 signaling: Potential role in Alzheimer's pathogenesis. *Neurochem Int*, 150: 105186. doi: 10.1016/j.neuint.2021.105186

14. Salminen A., Kaarniranta K., **Kauppinen A.** (2021) Insulin/IGF-1 signaling promotes immunosuppression via the STAT3 pathway: impact on the aging process and age-related diseases. *Inflamm Res*, 70(10-12): 1043-1061. doi: 10.1007/s00011-021-01498-3

15. Sridevi Gurubaran I., Heloterä H., Marry S., Koskela A., Hyttinen JMT., Paterno JJ., Urtti A., Chen M., Xu H., **Kauppinen A.**, Kaarniranta K. (2021) Oxidative Stress and Mitochondrial Damage in Dry Age-Related Macular Degeneration Like NFE2L2/PGC-1α -/- Mouse Model Evoke Complement Component C5a Independent of C3. *Biology (Basel)*, 10(7): 622. doi: 10.3390/biology10070622

16. Korhonen E, Hytti M, Piippo N, Kaarniranta K, **Kauppinen A.** (2021) Antimycin A-induced mitochondrial dysfunction regulates inflammasome signaling in human retinal pigment epithelial cells. *Exp Eye Res*, 209: 108687. doi: 10.1016/j.exer.2021.108687

17. Hytti M, Korhonen E, Hongisto H, Kaarniranta K, Skottman H, **Kauppinen A.** (2021) Differential Expression of Inflammasome-Related Genes in Induced Pluripotent Stem-Cell-Derived Retinal Pigment Epithelial Cells with or without History of Age-Related Macular Degeneration. *Int J Mol Sci*, 22(13):6 800. doi: 10.3390/ijms22136800

18. Bhattarai N., Korhonen E., Mysore Y., Kaarniranta K., **Kauppinen A.** (2021) Hydroquinone Induces NLRP3-Independent IL-18 Release from ARPE-19 Cells. *Cells*, 10(6): 1405. doi: 10.3390/cells10061405

19. Ranta-Aho S., Piippo N., Korhonen E., Kaarniranta K., Hytti M., **Kauppinen A.** (2021) TAS-116, a Well-Tolerated Hsp90 Inhibitor, Prevents the Activation of the NLRP3 Inflammasome in Human Retinal Pigment Epithelial Cells. *Int J Mol Sci,* 22(9): 4875. doi: 10.3390/ijms22094875

20. Klionsky D., … **Kauppinen A**., … Tong CK. (2021) Guidelines for the use and interpretation of assays for monitoring autophagy (4th edition). *Autophagy*, 17(1): 1-382. doi: 10.1080/15548627.2020.1797280

21. Mysore Y., Del Amo E.M., Loukovaara S., Hagström M., Urtti A., **Kauppinen A.** (2021) Statins for the prevention of proliferative vitreoretinopathy: cellular responses in cultured cells and clinical statin concentrations in the vitreous. *Sci Rep*, 11(1): 980. doi: 10.1038/s41598-020-80127-1

22. Bhattarai N., Piippo N., Ranta-aho S., Mysore Y., Kaarniranta K., **Kauppinen A.** (2021) Effects of Resvega on Inflammasome Activation in Conjunction with Dysfunctional Intracellular Clearance in Retinal Pigment Epithelial (RPE) Cells. *Antioxidants (Basel)*, 10(1): 67. doi: 10.3390/antiox10010067

23. Salminen A., Kaarniranta K., **Kauppinen A.** (2020) Exosomal vesicles enhance immunosuppression in chronic inflammation: Impact in cellular senescence and the aging process. *Cell Signal*, 75: 109771. doi: 10.1016/j.cellsig.2020.109771.

24. Kaarniranta K., Uusitalo H., Blasiak J., Felszeghy S., Kannan R., **Kauppinen A.**, Salminen A., Sinha D., Ferrington D. (2020) Mechanisms of mitochondrial dysfunction and their impact on age-related macular degeneration. *Prog Retin Eye Res*, 79: 100858. doi: 10.1016/j.preteyeres.2020.100858.

25. Salminen A., Kaarniranta K., **Kauppinen A.** (2020) ER stress activates immunosuppressive network: implications for aging and Alzheimer's disease. *J Mol Med (Berl),* 98(5): 633-650. doi: 10.1007/s00109-020-01904-z.

26. Korhonen E., Bisevac J., Hyttinen JMT., Piippo N., Hytti M., Kaarniranta K., Petrovski G., **Kauppinen A.** (2020) UVB-induced inflammasome activation can be prevented by cis-urocanic acid in human corneal epithelial cells. *Invest Ophtalmol Vis Sci*, 61(4): 7. doi: 10.1167/iovs.61.4.7.

27. **Kauppinen A.**, Kaarniranta K., Salminen A. (2020) Potential role of myeloid-derived suppressor cells (MDSCs) in age-related macular degeneration (AMD). *Front Immunol*, 11: 384. doi: 10.3389/fimmu.2020.00384.

28. Bhattarai N., Korhonen E., Toppila M., Koskela A., Kaarniranta K., Mysore Y., **Kauppinen A.** (2020) Resvega Alleviates Hydroquinone-Induced Oxidative Stress in ARPE-19 Cells. *Int J Mol Sci*, 21(6): 2066. doi: 10.3390/ijms21062066.

29. Korhonen E., Piippo N., Hytti M., Hyttinen JMT., Kaarniranta K., **Kauppinen A.** (2020) Only IL-1β release is inflammasome-dependent upon ultraviolet B irradiation although IL-18 is also secreted. *FASEB J,* 34(5): 6437-6448. doi: 10.1096/fj.201902355RR.

30. Sridevi Gurubaran I., Viiri J., Koskela A., Hyttinen JMT., Paterno JJ., Kis G., Antal M., Urtti A., **Kauppinen A.**, Felszeghy S., Kaarniranta K. (2020) Mitophagy in the Retinal Pigment Epithelium of Dry Age-Related Macular Degeneration Investigated in the *NFE2L2/PGC-1α-/-* Mouse Model. *Int J Mol Sci,* 21(6): 1976. doi: 10.3390/ijms21061976.

31. **Kauppinen A.** (2020) Introduction to the multi-author review on macular degeneration. *Cell Mol Life Sci*, 77(5): 779-780. doi: 10.1007/s00018-019-03418-5.

32. Aro A., **Kauppinen A.**, Kivinen N., Selander T., Kinnunen K., Tuomilehto J., Keinänen-Kiukaanniemi S., Lindström J., Uusitupa M., Kaarniranta K. (2019) Lifestyle intervention improves retinopathy status - The Finnish diabetes prevention study. *Nutrients*, 11(7): 1691. doi: 10.3390/nu11071691.

33. Salminen A., **Kauppinen A**., Kaarniranta K. (2019) AMPK activation inhibits the functions of myeloid-derived suppressor cells (MDSC): Impact on cancer and aging. *J Mol Med*, 97: 1049-1064. doi: 10.1007/s00109-019-01795-9.

34. Hytti M., Korhonen E., Hyttinen JMT., Roehrich H., Kaarniranta K., Ferrington DA., **Kauppinen A.** (2019) Antimycin A-induced mitochondrial damage causes human RPE cell death despite activation of autophagy. *Oxidat Med Cell Longev*, Mar 17: 2019: 1583656. doi: 10.1155/2019/1583656.

35. Szatmári-Tóth M., Ilmarinen T., Mikhailova A., Skottman H., **Kauppinen A.**, Kaarniranta K., Kristóf E., Veréb Zoltán, Fésüs L., Petrovski G. (2019) Human embryonic stem cells-derived retinal pigment epithelium - role in dead cell clearane and inflammation. *Int J Mol Sci*, 20(4): 926. doi: 10.3390/ijms20040926.

36. Salminen A., Kaarniranta K., **Kauppinen A.** (2019) Immunosenescence: The potential role of myeloid-derived suppressor cells (MDSCs) in age-related immune deficiency. *Cell Mol Life Sci*, 76(10): 1901-1918. doi: 10.1007/s00018-019-03048-x.

37. Korhonen E., Piippo N., Hytti M., Hyttinen JMT., Kaarniranta K., **Kauppinen A.** (2019) SQSTM1/p62 regulates the production of IL-8 and MCP-1 in IL-1β- T stimulated human retinal pigment epithelial cells. *Cytokine*, 116: 70-77. doi: 10.1016/j.cyto.2018.12.015.

38. Zeiner J., Loukovaara S., Losenkova K., Zuccarini M., Korhonen AM., Lehti K., **Kauppinen A.**, Kaarniranta K., Müller CE., Jalkanen S., Yegutkin GG. (2019) Soluble and membrane-bound adenylate

kinase and nucleotidases augment ATP-mediated inflammation in diabetic retinopathy eyes with vitreous hemorrhage. *J Mol Med (Berl)*, 97(3): 341-354. doi: 10.1007/s00109-018-01734-0.

39. Felszheghy S., Viiri J., Paterno J., Hyttinen JMT., Koskela A., Chen M., Leinonen HO, Tanila H., Kivinen N., Koistinen A., Toropainen E., Smedowski A., Reinisalo M., Winiarczyk M., Mackiewitz J., Kettunen M., Kinnunen K., Blasiak J., Bjorkoy G., Koskelainen A., Skottman H., Urtti A., Salminen A., Kannan R., Ferrington D., Xu H., Levonen A-L., Tavi P., **Kauppinen A.**, Kaarniranta K. (2019) Loss of NRF-2 and PGC-1α genes leads to retinal pigment epithelium damage resembling dry age-related macular degeneration. *Redox Biol*, 20:1-12. doi: 10.1016/j.redox.2018.09.011.

40. Salminen A., Kaarniranta K., **Kauppinen A.** (2018) The role of myeloid-derived suppressor cells (MDSC) in the inflammaging process. *Aging Res Rev*, 48:1-10. doi: 10.1016/j.arr.2018.09.001.

41. Piippo N., Korhonen E., Hytti M., Kinnunen K., Kaarniranta K., **Kauppinen A.** (2018) Oxidative stress is the principal contributor to inflammasome activation in retinal pigment epithelium cells with defunct proteasomes and autophagy. *Cell Physiol Biochem*, 49: 359-367. doi: 10.1159/000492886.

42. Kaarniranta K, Koskela A, Felszeghy S, Kivinen N, Salminen A, **Kauppinen A.** (2018) Fatty acids and oxidized lipoproteins contribute to autophagy and innate immunity responses upon the degeneration of retinal pigment epithelium and development of age-related macular degeneration. *Biochimie*, Jul 18, doi: 10.1016/j.biochi.2018.07.010. [Epub ahead of print]

43. Salminen A., **Kauppinen A.**, Kaarniranta K. (2018) Myeloid-derived suppressor cells (MDSCs): an important partner in cellular/tissue senescence. *Biogerontology*, 19: 325-339. doi: 10.1007/s10522-018-9762-8.

44. Salminen A., Kaarniranta K., **Kauppinen A.** (2018) Phytochemicals inhibit the immunosuppressive functions of myeloid-derived suppressor cells (MDSC): Impact on cancer and age-related chronic inflammatory disorders. *Int Immunopathol*, 61: 231-240. doi: 10.1016/j.intimp.2018.06.005.

45. Salminen A., Kaarniranta K., **Kauppinen A.** (2018) The potential importance of myeloid-derived suppressor cells (MDSCs) in the pathogenesis of Alzheimer's disease. *Cell Mol Life Sci*, 75: 3099-3120. doi: 10.1007/s00018-018-2844-6.

46. Piippo N., Korhonen E., Hytti M., Skottman H., Kinnunen K., Josifovska N., Petrovski G., Kaarniranta K., **Kauppinen A.** (2018) Hsp90 inhibition as a means to inhibit activation of the NLRP3 inflammasome. *Sci Rep*, 8: 6720. doi: 10.1038/s41598-018-25123-2.

47. Kaarniranta K., Xu H., **Kauppinen A.** (2018) Mechanistical retinal drug targets and challenges. *Adv Drug Deliv Rev*, 126: 177-184. doi: 10.1016/j.addr.2018.04.016.

48. Marchesi N., Thongon N., Pascale A., Provenzani A., Koskela A., Korhonen E., Smedowski A., Govoni S., **Kauppinen A.**, Kaarniranta K., Amadio M. (2018) Autophagy stimulus promotes early HuR protein activation and p62/SQSTM1 protein synthesis in ARPE-19 cells by triggering Erk1/2, p38MAPK and JNK kinase pathways, *Oxid Med Cell Longev*, 2018: 4956080, doi: 10.1155/2018/4956080.

49. Hytti M., Andjelic S., Josifovska N., Piippo N., Korhonen E., Hawlina M., Kaarniranta K., Nevalainen T., Petrovski G., Parkkari T., **Kauppinen A.** (2017) CB2 receptor activation causes an ERK1/2-dependent inflammatory response in human RPE cells. *Sci Rep*, 7(1): 16169, doi: 10.1038/s41598-017-16524-w.

50. Salminen A., Kaarniranta K., **Kauppinen A.** (2017) Integrated stress response stimulates FGF21 expression: Systemic enhancer of longevity. *Cell Signal*, 40: 10-21, doi: 10.1016/j.cellsig.2017.08.009.

51. Arjamaa O., Aaltonen V., Piippo N., Csont T., Petrovski G., Kaarniranta K., **Kauppinen A.** (2017) Hypoxia and inflammation in the release of VEGF and interleukins from human retinal pigment epithelial cells. *Graefes Arch Clin Exp Ophthalmol*, Jun 19, doi: 10.1007/s00417-017-3711-0.

52. Kaarniranta K., Petrovski G., **Kauppinen A.** (2017) The Nobel Prized cellular target autophagy in eye diseases. *Acta Ophthalmol*, 95(4): 335-336, doi: 10.1111/aos.13344.

53. Salminen A., Kaarniranta K, **Kauppinen A.** (2017) Regulation of longevity by FGF21: Interaction between energy metabolism and stress responses. *Ageing Res Rev*, 37: 79-93, doi: 10.1016/j.arr.2017.05.004.

54. Kinnunen K., Piippo N., Loukovaara S., Hytti M., Kaarniranta K., **Kauppinen A.** (2017) Lysosomal destabilization activates the NLRP3 inflammasome in human umbilical vein endothelial cells (HUVECs). *J Cell Commun Signal*, 11(3): 275-279, doi: 10.1007/s12079-017-0396-4.

55. Hyttinen JMT., Błasiak J., Niittykoski M., Kinnunen K., **Kauppinen A.**, Salminen A., Kaarniranta K. (2017) DNA damage response and autophagy in the degeneration of retinal pigment epithelial cells – Implications for age-related macular degeneration (AMD). *Ageing Res Rev,* 36: 64-77. doi: 10.1016/j.arr.2017.03.006.

56. Loukovaara S., Piippo N., Kinnunen K., Hytti M., Kaarniranta K., **Kauppinen A.** (2017) NLRP3 inflammasome activation is associated with proliferative diabetic retinopathy. *Acta Ophthalmol*, Mar 8, doi: 10.1111/aos.13427.

57. Hytti M., Szabó D., Piippo N., Korhonen E., Honkakoski P., Kaarniranta K., Petrovski G, **Kauppinen A**. (2017) Two dietary polyphenols, fisetin and luteolin, reduce inflammation but augment DNA damage-induced toxicity in human RPE cells. *J Nutr Biochem,* 42: 37-42. doi: 10.1016/j.jnutbio.2016.12.014.

58. Salminen A., **Kauppinen A.**, Kaarniranta K. (2017) Hypoxia/ischemia activate processing of Amyloid Precursor Protein: impact of vascular dysfunction in the pathogenesis of Alzheimer's disease. *J Neurochem,* 140(4): 536-549. doi: 10.1111/jnc.13932.

59. Salminen A., **Kauppinen A.**, and Kaarniranta K. (2016) FGF21 activates AMPK signaling: impact on metabolic regulation and the aging process. *J Mol Med (Berl)*, 95: 123-131, doi: 10.1007/s00109-016-1477-1.

60. Szatmári-Tóth M., Kristóf E., Veréb Z., Akthar S., Facskó A., Fésüs, L., **Kauppinen A.**, Kaarniranta K., and Petrovski G. (2016) Clearance of dying autophagic retinal pigment epithelial cells - a possible source for inflammation in age-related macular degeneration. *Cell Death Dis*, 7(9): e2367, doi: 10.1038/cddis.2016.133.

61. Trzeciecka A., Paterno J., Toropainen E., Koskela A., Podracka L., Korhonen E., **Kauppinen A.**, Wylegala E., Kaarniranta K., and Smedowski A. (2016) Long-term topical application of preservative-free prostaglandin analogues can evoke macrophage infiltration in the ocular adnexa. *Eur J Pharmacol*, 788: 12-20, doi: 10.1016/j.ejphar.2016.06.014.

62. Salminen A., Kaarniranta K, and **Kauppinen A.** (2016) AMPK and HIF signaling pathways regulated both longevity and cancer growth: the good news and the bad news about survival mechanisms. *Biogerontology*, 17(4): 655-680, doi: 10.1007/s10522-016-9655-7.

63. Kivinen N., Felszeghy S., Kinnunen AI., Setälä N., Aikio M., Kinnunen K., Sironen R., Pihlajaniemi T., **Kauppinen A.***, and Kaarniranta K.* (2016) Absence of collagen XVIII in mice causes age-related insufficiency in retinal pigment epithelium proteostasis. *Biogerontology*, 17(4): 749-761, doi: 10.1007/s10522-016-9647-7. * equal contribution

64. Salminen A., Kaarniranta K., and **Kauppinen A.** (2016) Hypoxia-Inducible Histone Lysine Demethylases: Impact on the Aging Process and Age-Related Diseases. *Aging Dis*, 7(2): 180-200, doi: 10.14336/AD.2015.0929.

65. Hytti M., Tokarz P., Määttä E., Piippo N., Korhonen E., Suuronen T., Honkakoski P., Lahtela-Kakkonen M., Kaarniranta K., and **Kauppinen A.** (2016) Inhibition of BET bromodomains alleviates inflammation in human RPE cells. *Biochem Pharmacol*, 110-111: 71-79, doi: 10.1016/j.bcp.2016.04.009.

66. Salminen A., Kaarniranta K., and **Kauppinen A.** (2016) Age-related changes in AMPK activation: Role for AMPK phosphatases and inhibitory phosphorylation by upstream signaling pathways. *Ageing Res Rev*, 28: 15-26, doi: 10.1016/j.arr.2016.04.003.

67. Salminen A., **Kauppinen A.**, and Kaarniranta K. (2016) AMPK/Snf1 signaling regulates histone acetylation: impact on gene expression and epigenetic functions. *Cell Signal*, 28(8): 887-895, doi: 10.1016/j.cellsig.2016.03.009.

68. **Kauppinen A.**, Paterno J., Blasiak J., Salminen A., and Kaarniranta K. (2016) Inflammation and its role in age-related macular degeneration. *Cell Mol Life Sci*, 73(9): 1765-1786, doi: 10.1007/s00018-016-2147-8.

69. Korhonen E., Rönkkö S., Hillebrand S., Riikonen J., Xu W., Järvinen K., Lehto V-P., and **Kauppinen A.** (2016) Cytotoxicity assessment of porous silicon microparticles for ocular drug delivery. *Eur J Pharm Biopharm*, 100: 1-8, doi: 10.1016/j.ejpb.2015.11.020.

70. Hytti M., Piippo N., Korhonen E., Honkakoski P., Kaarniranta K., and **Kauppinen A.** (2015) Fisetin and luteolin protect human retinal pigment epithelial cells from oxidative stress-induced cell death and alleviate inflammation. *Sci Rep*, 5: 17645, doi: 10.1038/srep17645.

71. Salminen A., **Kauppinen A.**, and Kaarniranta K. (2015) 2-Oxoglutarate-dependent dioxygenases are sensors of energy metabolism, oxygen availability, and iron homeostasis: Potential role in the regulation of aging process. *Cell Mol Life Sci*, 72(20): 3897-3914, doi: 10.1007/s00018-015-1978-z.

72. Salminen A., Haapasalo A., **Kauppinen A.**, Kaarniranta K., Soininen H., and Hiltunen M. (2015) Impaired mitochondrial energy metabolism in Alzheimer's disease: impact on pathogenesis via disturbed epigenetic regulation of chromatin landscape. *Prog Neurobiol*, 131: 1-20, doi: 10.1016/j.pneurobio.2015.05.001.

73. Hytti M., Piippo N., Salminen A., Honkakoski P., Kaarniranta K., and **Kauppinen A.** (2015) Quercetin alleviates 4-hydroxynonenal-induced cytotoxicity and inflammation in ARPE-19 cells. *Exp Eye Res*, 132: 208-215, doi: 10.1016/j.exer.2015.02.001.

74. Kaarniranta K., Machalińska A., Veréb Z., Salminen A., Petrovski G., and **Kauppinen A.** (2015) Estrogen signalling in the pathogenesis of age-related macular degeneration. *Curr Eye Res*, 40(2): 226-233, doi: 10.3109/02713683.2014.925933.

75. Yrjölä S., Sarparanta M., Airaksinen A., Hytti M., **Kauppinen A.**, Pasonen-Seppänen S., Adinolfi B., Nieri P., Manera C., Poso A., Nevalainen TJ., and Parkkari T. (2015) Synthesis, in vitro and in vivo evaluation of 1,3,5-triazines as cannabinoid CB2 receptor agonists. *Eur J Pharm Sci*, 67C: 85-96, doi: 10.1016/j.ejps.2014.11.003.

76. Piippo N., Korkmaz A., Hytti M., Kinnunen K., Salminen A., Atalay M., Kaarniranta K., and **Kauppinen A.** (2014) Decline in cellular clearance systems induces inflammasome signaling in human ARPE-19 cells. *Biochim Biophys Acta*, 1843(12): 3038-3046, doi: 10.1016/j.bbamcr.2014.09.015.

77. Salminen A., Kaarniranta K., Hiltunen M., and **Kauppinen A.** (2014) Histone demethylase Jumonji D3 (JMJD3/KDM6B) at the nexus of epigenetic regulation of inflammation and the aging process. *J Mol Med (Berl.)*, 92(10): 1035-1043, doi: 10.1007/s00109-014-1182-x.

78. Salminen A., **Kauppinen A.**, Hiltunen M., and Kaarniranta K. (2014) Krebs cycle intermediates regulate DNA and histone methylation: Epigenetic impact on the aging process. *Ageing Res Rev,* 16C: 45-65, doi: 10.1016/j.arr.2014.05.004.

79. Penttilä E., Hyttinen J., Hytti M., **Kauppinen A.**, Smirnov G., Tuomilehto H., Seppä J., Nuutinen J., and Kaarniranta K. (2014) Up-regulation of inflammation genes in nasal mucosa of patients undergoing endonasal dacryocytorhinostomy. *Clin Ophthalmol*, 8: 799-805, doi: 10.2147/OPTH.S50195.

80. Salminen A., Kaarniranta K, and **Kauppinen A.** (2014) Krebs cycle dysfunction shapes epigenetic landscape of chromatin: novel insights into mitochondrial regulation of aging process. *Cell Signal*, 26(7): 1598-1603, doi: 10.1016/j.cellsig.2014.03.030.

81. **Kauppinen A.**, Nevalainen T., Hytti M., Salminen A., Kaarniranta K., and Parkkari T. (2014) CB2 receptor as a potential target in age-related diseases. *J Biochem Pharmacol Res*, 2(1): 33-43.

82. Kivinen N., Hyttinen JMT., Viiri J., Paterno J., Felszheghy S., **Kauppinen A.**, Salminen A., and Kaarniranta K. (2014) Hsp70 binds reversibly to proteasome inhibitor–induced protein aggregates and evades autophagic clearance in ARPE-19 cells. *J Biochem Pharmacol Res*, 2(1): 1-7.

83. Kinnunen K., **Kauppinen A.**, Piippo N., Koistinen A., Toropainen E., and Kaarniranta K. (2014) Cationorm shows good tolerability on human corneal epithelial cell HCE-2 cultures. *Exp Eye Res*, 120C: 82-89, doi: 10.1016/j.exer.2014.01.006.

84. Salminen A., **Kauppinen A.**, Hiltunen M., and Kaarniranta K. (2013) Epigenetic regulation of ASC/TMS1 expression: potential role in apoptosis and inflammasome function. *Cell Mol Life Sci*, 71(10): 1855-64, doi: 10.1007/s00018-013-1524-9.

85. **Kauppinen A.**, Salminen, A., and Kaarniranta K. (2013) Inflammation as a target of minocycline: special interest in the regulation of inflammasome signaling. *Inflammasome*, 1: 2-14, doi: 10.2478/infl-2013-0002.

86. Salminen A., Kaarniranta K., **Kauppinen A.**, Ojala J., Haapasalo A., Soininen H., and Hiltunen M. (2013) Impaired autophagy and APP processing in Alzheimer's disease: The potential role of Beclin 1 interactome. *Prog Neurobiol*, 106-107: 33-54, doi: 10.1016/j.pneurobio.2013.06.002.

87. Tokarz P., **Kauppinen A**., Kaarniranta K., and Blasiak J. (2013) Oxidative DNA Damage and Proteostasis in Age-Related Macular Degeneration. *J Biochem Pharmacol Res*, 1(2): 106-113.

88. **Kauppinen A.**, Suuronen T., Ojala J., Kaarniranta K., and Salminen A. (2013) Antagonistic crosstalk between NF-κB and SIRT1 in the regulation of inflammation and metabolic disorders. *Cell Signal*, 25(10): 1939-48, doi: 10.1016/j.cellsig.2013.06.007.

89. Klettner A.*, **Kauppinen A.***, Blasiak J., Roider J., Salminen A., and Kaarniranta K. (2013) Cellular and molecular mechanisms of age-related macular degeneration: From impaired autophagy to neovascularization. *Int J Biochem Cell Biol*, 45(7): 1457-1467, doi: 10.1016/j.biocel.2013.04.013. * equal contribution

90. Kaarniranta K., Sinha D., Blasiak J., **Kauppinen A.**, Veréb Z., Salminen A., Boulton M., and Petrovski G. (2013) Autophagy and heterophagy dysregulation leads to retinal pigment epithelium dysfunction and development of age-related macular degeneration. *Autophagy*, 9(7): 973-984, doi: 10.4161/auto.24546.

91. Salminen A., Kaarniranta K., and **Kauppinen A.** (2013) Crosstalk between oxidative stress and SIRT1: impact on the aging process. *Int J Mol Sci*, 14(2): 3834-3859, doi: 10.3390/ijms14023834.

92. Salminen A., Kaarniranta K., and **Kauppinen A.** (2013) Beclin 1 interactome controls the crosstalk between apoptosis, autophagy and inflammasome activation: impact on the aging process. *Ageing Res Rev*, 12: 520-534, doi: 10.1016/j.arr.2012.11.004.

93. Blasiak J., Glowacki S., **Kauppinen A.**, and Kaarniranta K. (2013) Mitochondrial and nuclear DNA damage and repair in age-related macular degeneration. *Int J Mol Sci*, 14: 2996-3010, doi: 10.3390/ijms14022996.

94. Kaarniranta K., **Kauppinen A.**, Blasiak J., and Salminen A. (2012) Autophagy regulating kinases as potential therapeutic targets for age-related macular degeneration (AMD). *Future Med Chem*, 4(17): 2153-61, doi: 10.4155/fmc.12.169.

95. Salminen A., Hyttinen J., **Kauppinen A.**, and Kaarniranta K. (2012) Context-dependent regulation of autophagy by IKK-NF-□B signaling: impact on the aging process. *Int J Cell Biol*, 2012: 849541, doi: 10.1155/2012/849541.

96. **Kauppinen A.**, Niskanen H., Suuronen T., Kinnunen K., Salminen A., and Kaarniranta K. (2012) Oxidative stress activates NLRP3 inflammasomes in ARPE-19 cells -implications for age-related macular degeneration (AMD). *Immunol Lett*, 147(1-2): 29-33, doi: 10.1016/j.imlet.2012.05.005.

97. Paimela T., Ryhänen T., **Kauppinen A.**, Marttila L., Salminen A., and Kaarniranta K. (2012) The preservative polyquaternium-1 increases cytotoxicity and NF-kappaB linked inflammation in human corneal epithelial cells. *Mol Vis*, 18: 1189-1196.

98. Salminen A., Ojala J., Kaarniranta K., and **Kauppinen A.** (2012) Mitochondrial dysfunction and oxidative stress activate inflammasomes: impact on the aging process and age-related diseases (2012) *Cell Mol Life Sci*, 69(18): 2999-3013, doi: 10.1007/s00018-012-0962-0.

99. Salminen. A., Kaarniranta K., and **Kauppinen A.** (2012) Inflammaging: disturbed interplay between autophagy and inflammasomes. *Aging* Mar; 4(3):166-175, doi: 10.18632/aging.100444.

100.Salminen A, **Kauppinen A.**, Kaarniranta K. (2012) Emerging role of NF-κB signaling in the induction of sensescence-associated secretory phenotype (SASP). *Cell Signal*, 24(4):835-45, doi: 10.1016/j.cellsig.2011.12.006.

101.Salminen A., **Kauppinen A.**, and Kaarniranta K. (2012) Phytochemicals suppress NF-κB signaling: impact on healthspan and the aging process. *Curr Opin Clin Nutr Metab Care,* 15(1):23-28, doi: 10.1097/MCO.0b013e32834d3ae7.

102.**Kauppinen A.**, Peräsaari J., Taivainen A., Kinnunen T., Saarelainen S., Rytkönen-Nissinen M., Jeal H., Jones M., and Virtanen T. (2012) Association of HLA class II alleles with sensitization to Bos d 2, an important agricultural allergen. *Immunobiology*, 217(1):8-12, doi: 10.1016/j.imbio.2011.08.012.

103.Jauhonen H-M.*, **Kauppinen A.***, Paimela T., Laihia JK., Leino L., Salminen A., and Kaarniranta K. (2011) Cis-urocanic acid inhibits SAPK/JNK signaling pathway in UV-B exposed human corneal epithelial cells in vitro. *Mol Vis*, 17:2311-2317. * equal contribution

104.Salminen A., **Kauppinen A.**, Hyttinen J., Toropainen E., and Kaarniranta K. (2010) Endoplasmic reticulum stress in age-related macular degeneration (AMD): trigger for neovascularization. *Mol Med*, 16(11-12):535-42, doi: 10.2119/molmed.2010.00070.

105.Nuutinen T., Suuronen T., **Kauppinen A.**, and Salminen A. (2010) Valproic acid stimulates clusterin expression in human astrocytes: implications for Alzheimer's disease. *Neurosci Lett*, 475(2):64-68, doi: 10.1016/j.neulet.2010.03.041.

106.Salminen A., **Kauppinen A.**, Suuronen T., Kaarniranta K., and Ojala J. (2009) ER stress in Alzheimer's disease: a novel neuronal trigger for inflammation and Alzheimer's pathology. *J Neuroinflamm* 6:41, doi: 10.1186/1742-2094-6-41.

107.Viiri J., Jauhonen H-M., **Kauppinen A.**, Ryhänen T., Paimela T., Hyttinen J., Sorri I., Laihia J., Leino L., and Kaarniranta K. (2009) Cis-urocanic acid suppresses UV-B-induced interleukin-6 and -8 secretion and cytotoxicity in human corneal and conjunctival epithelial cells in vitro. *Mol Vis*, 15:1799-805.

108.Juntunen R, Liukko A., Taivainen A., Närvänen A., **Kauppinen A.**, Nieminen A., Rytkönen-Nissinen M., Saarelainen S., Maillère B., Virtanen T., and Kinnunen T. (2009) Suboptimal recognition of a T cell epitope of the major dog allergen Can f 1. *Mol Immunol*, 46(16):3320-3327, doi: 10.1016/j.molimm.2009.07.022.

109.Nuutinen T., Suuronen T., **Kauppinen A.**, and Salminen A. (2009) Clusterin: A forgotten player in Alzheimer's disease. *Brain Res Rev*, 61(2):89-104, doi: 10.1016/j.brainresrev.2009.05.007.

110.Salminen A., Ojala J., **Kauppinen A.**, Kaarniranta K., and Suuronen T. (2009) Inflammation in Alzheimer's disease: Amyloid-ß oligomers trigger innate immunity defence via pattern recognition receptors. *Prog Neurobiol*, 87(3):181-94.

111.Salminen A., Ojala J., Suuronen T., Kaarniranta K., and **Kauppinen A.** (2008) Amyloid-beta oligomers set fire to inflammasomes and induce Alzheimer's pathology. *J Cell Mol Med* 12(6A): 2255-2262, doi: 10.1111/j.1582-4934.2008.00496.x.

112.Salminen A., **Kauppinen A.**, Suuronen T., and Kaarniranta K. (2008) SIRT1 longevity factor suppresses NF-kappaB -driven immune responses: regulation of aging via NF-kappaB acetylation? *Bioessays*, 30(10): 939-942, doi: 10.1002/bies.20799.

113.Salminen A., Ojala J., Huuskonen J., **Kauppinen A.**, Suuronen T., and Kaarniranta K. (2008) Interaction of aging-associated signaling cascades: Inhibition of NF-κB signaling by longevity factors FoxOs and SIRT1. *Cell Mol Life Sci*, 65(7-8):1049-1058, doi: 10.1007/s00018-008-7461-3.

114.Saarelainen S., Rytkönen-Nissinen M., Rouvinen J., Taivainen A., Auriola S., **Kauppinen A.**, Kinnunen T., and Virtanen T. (2008) Animal-derived lipocalin allergens exhibit immunoglobulin E cross-reactivity. *Clin Exp Allergy* 38(2): 374-381, doi: 10.1111/j.1365-2222.2007.02895.x.

115.Salminen A., Huuskonen J., Ojala J., **Kauppinen A.**, Kaarniranta K., and Suuronen T. (2008) Activation of innate immunity system during aging: NF-κB signaling is the molecular culprit of inflamm-aging. *Ageing Res Rev*, 7(2): 83-105, doi: 10.1016/j.arr.2007.09.002.

116.Saarelainen S., Kinnunen T., Buhot C., Närvänen A., **Kauppinen A.**, Rytkönen-Nissinen M., Maillere B., and Virtanen T. (2008) Immunotherapeutic potential of the immunodominant T-cell epitope of lipocalin allergen Bos d 2 and its analogues. *Immunology*, 123(3): 358-66, doi: 10.1111/j.1365-2567.2007.02699.x.

117.**Immonen A.**, Kinnunen T., Sirven P., Taivainen A., Houitte D., Peräsaari J., Närvänen A., Saarelainen S., Rytkönen-Nissinen M., Maillere B., and Virtanen T. (2007) The major horse allergen

Equ c 1 contains one immunodominant region of T cell epitopes. *Clin Exp Allergy* 37(6): 939-947, doi: 10.1111/j.1365-2222.2007.02722.x.

118. Kinnunen T., Jutila K., Kwok WW., Rytkönen-Nissinen M., **Immonen A.**, Saarelainen S., Närvänen A., Taivainen A., and Virtanen T. (2007) Potential of an altered peptide ligand of lipocalin allergen Bos d 2 for peptide immunotherapy. *J Allergy Clin Immunol* 119(4): 965-972, doi: 10.1016/j.jaci.2007.01.011.

119. **Immonen AK.**, Taivainen AH., Närvänen ATO. Kinnunen TT., Saarelainen SA. Rytkönen-Nissinen MA., and Virtanen TI. (2007) Use of multiple peptides containing T cell epitopes is a feasible approach for peptide-based immunotherapy in Can f 1 allergy. *Immunology* 120(1): 38-46, doi: 10.1111/j.1365-2567.2006.02475.x.

120. Kinnunen T., Kwok WW., Närvänen A., Rytkönen-Nissinen M., **Immonen A.**, Saarelainen S., Taivainen A., and Virtanen T. (2005) Immunomodulatory potential of heteroclitic analogs of the dominant T-cell epitope of lipocalin allergen Bos d 2 on specific T cells. *Int Immunol* 17(12): 1573-1581, doi: 10.1093/intimm/dxh332.

121. **Immonen A.**, Farci S., Taivainen A., Partanen J., Pouvelle-Moratille S., Närvänen A., Kinnunen T., Saarelainen S., Rytkönen-Nissinen M., Maillere B., and Virtanen T. (2005) T cell epitope-containing peptides of the major dog allergen Can f 1 as candidates for allergen immunotherapy. *J Immunol* 175(6): 3614-3620, doi: 10.4049/jimmunol.175.6.3614.

122. Kinnunen T., Taivainen A., Partanen J., **Immonen A.**, Saarelainen S., Rytkönen-Nissinen M., Rautiainen J., and Virtanen T. (2005) The DR4-DQ8 haplotype and a specific T cell receptor Vbeta T cell subset are associated with absence of allergy to Can f 1. *Clin Exp Allergy* 35(6): 797-803, doi: 10.1111/j.1365-2222.2005.02247.x.

123. Markkula SE., Salo HM., **Immonen AK.**, and Jokinen EI. (2005) Effects of short- and longterm ultraviolet B irradiation on the immune system of the common carp (Cyprinus carpio). *Photochem Photobiol* 81(3): 595-602, doi: 10.1562/2004-07-13-RA-231.

124. Saarelainen S., Taivainen A., Rytkönen-Nissinen M., Auriola S., **Immonen A.**, Mäntyjärvi R., Rautiainen J., Kinnunen T., and Virtanen, T. (2004) Assessment of recombinant dog allergens Can f 1 and Can f 2 for the diagnosis of dog allergy. *Clin Exp Allergy* 34(10): 1576-1582, doi: 10.1111/j.1365-2222.2004.02071.x.

125. **Immonen A.**, Saarelainen S., Rautiainen J., Rytkönen-Nissinen M., Kinnunen T., Mäntyjärvi R., and Virtanen T. (2003) Probing the mechanisms of low immunogenicity of a lipocalin allergen Bos d 2 in a mouse model. *Clin Exp Allergy* 33: 834-841, doi: 10.1046/j.1365-2222.1999.00002.x-i1.

126. Jokinen EI., Salo HM., Markkula SE., **Immonen AK.**, and Aaltonen TM. (2001) Ultraviolet B Irradiation Modulates the Immune System of Fish (*Rutilus rutilus*, Cyprinidae) Part III: Lymhocytes. *Photochem Photobiol* 73(5): 505-512, doi: 10.1562/0031-8655(2001)0730505UBIMTI2.0.CO2.

127. Jokinen EI., Salo HM., Markkula SE., Aaltonen TM., and **Immonen AK.** (2000) Effects of Ultraviolet Light on Immune Parameters of the Roach. *Toxicol Lett* 112-113: 303-310, doi: 10.1016/S0378-4274(99)00240-4.

BOOK SECTIONS

1. Kaarniranta K., Salminen A., **Kauppinen A.** (2020) Retinal pigment epithelium in age-related macular degeneration. The Retinal Pigment Epithelium in Health and Disease. Springer. Edited by

Alexa Klettner and Stefan Dithmar. Springer International Publishing, ISBN 978-3-030-28384-1, 10.1007/978-3-030-28384-1

2. **Kauppinen A.** (2017) Mitochondria-associated inflammasome activation and its impact on aging and age-related diseases. Handbook of Immunosenescence, 2nd edition, Springer. Edited by Tamas Fulop, Claudio Franceschi, Katsuiku Hirokawa, and Graham Pawelec. doi:10.1007/978-3-319-64597-1_107-1

3. Salminen A., **Kauppinen A.** and Kaarniranta K. (2014) Inflammation, Advancing Age and Nutrition: Research, Science and Interventions. In Book: Inflammaging signaling in healthspan and lifespan regulation: next generation targets for longevity. Edited by Irfan Rahman and Debasis Bagchi. Pages 323-332; Academic Press; ISBN: 978-0-12-397803-5, http://dx.doi.org/10.1016/B978-0-12-397803-5.00027-7.

PUBLICATIONS INTENTED FOR PROFESSIONAL COMMUNITIES

1. Loukovaara S., Gucciardo E., Korhonen A., Öhman T., and **Kauppinen A.** (2022) Askeleita kohti verkkokalvon irtauman jälkeisen arven lääkkeellistä estoa. Duodecim 138(5): 408-418.

2. **Kauppinen A.** (2018) NLRP3-inflammasomiaktivaatio diabeettisessa retinopatiassa. *BestPractice, Diabetes ja Sydänsairaudet,* March 2018.

3. Kivinen N., Koskela A., **Kauppinen A.**, and Kaarniranta K. (2017) Silmänpohjan ikärappeuman patogeneesi – autofagian ja inflammasomien vuoropuhelua. *Duodecim* 133: 641-646.

4. **Immonen A.** and Virtanen T. (2005) Koira-allergian aiheuttajan lipokaliini Can f 1:n peptideistä apu allergian siedätyshoitoon? *Duodecim* 121(20): 2145.

5. **Immonen A.** (2005) Koiran pääallergeenin (Can f 1) T-soluepitoopit - peptideistä työkaluja immunoterapiaan? Kirjassa: Haahtela T, edit. *Allergiakoulu: Yearbook 33*, p. 56-57. Helsinki: Allergiatutkimussäätiö.

PUBLICATIONS INTENDED FOR THE GENERAL PUBLIC

1. Kinnunen Ali. Silmänpohjan ikärappeuma uhkaa yhä useampia. *Airut* 10/2015, Näkövammaisten keskusliitto ry.

2. Jonsson Sören, Kinnunen Ali. Åldersförändringar i gula fläcken hotar allt fler. *Finlands Synskadade* 5/2015, Förbundet Finlands Svenska Synskadades.

3. Sokeain Ystävät. Kasvikset voivat suojata ikärappeumalta. *Airut* 8/2014, Näkövammaisten keskusliitto ry.

4. Sokeain Ystävät. Ikärappeumassa soluihin kehittyy jätettä. *Tuntosarvi* 4/2014, Suomen Kuurosokeat ry.

THESES

1. **Kauppinen Anu** (2006) "Lipocalin Allergen-Induced T Cell Response: Prospects for Peptide-Based Immunotherapy" Kuopio University Publications D. Medical Sciences 399.

PATENTS AND INVENTION DISCLOSURES

1. An author with T. Virtanen, S. Pouvelle-Moratille, and B. Maillere of a patent on the use of the Can f 1 sequences described in *the Journal of Immunology*, 2005, 175: 3614-3620.