

Kai Kaarniranta, Professor, Chief Physician, MD., PhD., MSc
Institute of Clinical Medicine-Ophthalmology
Department of Ophthalmology; School of Medicine, University of Eastern Finland
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Curriculum vitae

Kai Kaarniranta (160268)

PRESENT POSITION

Specialist of Ophthalmology, Department of Ophthalmology, Kuopio University Hospital, P.O.BOX 1777, 70211 Kuopio, Finland 20.11.2006-Present

Professor and Chairman, Chief Physician, Department of Ophthalmology, University of Kuopio and University Hospital, P.O.Box 1777, 70210 Kuopio, Finland 1.1.2008-Present

EDUCATION

<u>Institution</u>	<u>Degree</u>	<u>Year</u>
Senior Secondary School		1990
Savonlinna College matriculation exam		1990
University of Kuopio MSc(Biotechnology)		2000
University of Kuopio MD		2000
University of Kuopio PhD (Medicine)		2002
University of Kuopio Docent (Experimental Ophthalmology)		2006
University of Kuopio Specialist in Ophthalmology		2006
University of Kuopio Docent (Ophthalmology)		2009

THESIS

Kaarniranta K. Regulatory Differences of the hsp70 Gene Response in Mammalian Cells. Doctoral dissertation. 2002. Kuopio University Publications D. Medical Sciences 274.81 p.

PROFESSIONAL APPOINTMENTS

Finnish Academy Graduate School, Department of Anatomy, University of Kuopio 1.1.2005-31.8.2000).

Juankoski Health Center, Juankoski, Finland (1.9.2000-31.5.2001; 1.8.-12.8.2001; 17.10- 23.10.2001);
General Practitioner

Department of Ophthalmology, North Karelia Central Hospital, Joensuu, Finland (5.11.2001-30.4.2003); Residential Ophthalmologist,

Department of Ophthalmology, Kuopio University Hospital (14.4.2003-19.11.2006); Residential Ophthalmologist

Department of Ophthalmology, Kuopio University Hospital (20.11.2006-31.12.2007); Specialist of Ophthalmology

Department of Ophthalmology, Kuopio University Hospital (1.1.2008-Present); Chief Physician

Department of Ophthalmology, University of Kuopio (1.1.2008-Present); Professor, Chairman

AWARDS

Martti Hämäläinen Young Scientists 2003

Kuopio University Scientist Award 2006

Second Poster Prize NOK 2006

SOE-lecture 2007

Elsemay Björn Young Scientist Award 2009

GRANTS

Finnish Cultural Foundation/North Savo 15 000 mk (1998), Finnish Medical Foundation 25 000 mk (1999), Emil Aaltonen Foundation 25 000 mk (1999), Emil Aaltonen Foundation 20 000 mk (2000)

Finnish Cultural Foundation/North Savo 20 000 mk (2000)

Kuopio University Foundation 15 000 mk (2001)

Finnish Medical Foundation 36 500 mk (2001)

Emil Aaltonen Foundation 20 000 mk (2002)

Finnish Eye Foundation 4000 eur (2003)

Finnish Medical Foundation 14 170 eur (2003)

Finnish Eye Foundation 4000 eur (2004)

Finnish Eye and Tissue Bank Foundation 6000 eur (2004)

Finnish Eye Foundation 6000 eur (2005)

Finnish Eye and Tissue Bank Foundation 5000 eur (2005)

Finnish Eye Foundation 10 000 eur (2006)

Finnish Eye and Tissue Bank Foundation 6000 eur (2006)

Finnish Eye Research Society 5000 eur (2006)

Finnish Eye Foundation 40 000 eur (2007)

Finnish Eye Foundation 10 000 eur (2008)

EVO 14 000 eur (2008)

Finnish Funding Agency for Technology and Innovation 345 000 eur (2004-2006)

Finnish Funding Agency for Technology and Innovation 630 000 eur (2008-2010)

Päivikki and Sakari Sohlberg Foundation 75 000 eur (2010)

Finnish Eye Foundation 150 000 eur

Finnish Academy 300 000 eur (2011-2013)

EVO 38 000 (2009-2010)

Finnish Funding Agency for Technology and Innovation 300 000 eur (2011-2014)
EVO 28 000 (2010-2011)
Finnish Eye Foundation (2011) 25 000 eur
EVO 50 000 eur (2012-2013)

SUPERVISING

Tuomas Ryhänen MSc, thesis work, University of Eastern Finland 2011
Eliisa Mannermaa MD, thesis work, University of Eastern Finland 2010
Tuomas Paimela MD student, thesis work, University of Kuopio 2007-
Johanna Viiri MSc, thesis work, University of Kuopio, 2007-
Tanja Nevalainen MD, thesis work, University of Kuopio, 2007-
Astrid Subrizi, MSc, thesis work, University of Helsinki, 2008-
Hanna-Mari Jauhonen, MD, thesis work, University of Kuopio 2009-
Liisa Marttila MD, thesis work, University of Kuopio 2011-
Lucia Podrocka MSc, thesis work, University of Eastern Finland 2010-
Niko Kivinen MD student, thesis work, University of Eastern Finland 2010-
Pasi Vottonen MD, thesis work, University of Eastern Finland 2011-

Tuomas Ryhänen MSc, pro gradu, University of Kuopio 2005
Johanna Viiri MSc, pro gradu, University of Kuopio, 2007
Tapio Nuutinen, MSc pro gradu, University of Kuopio 2008

MEMBERSHIPS IN SCIENTIFICAL SOCIETIES

Secretary of Finnish Ophthalmology Society 2006-2007
European Leadership Development Programme (EuLDP) 2007-2009
Board of Directors Acta Ophthalmologica 2009-

OTHER ACADEMICAL ACTIVITIES

Managing Editor Frontiers in Bioscience 2010-
Associate Editor Journal of Alzheimer's Disease 2011
Editor in Ageing Research Reviews 2012-2014

Opponent for Anu Vaajanen thesis, 2009
Opponent for Elisa Vuori-Heikkilä thesis, 2010
Reviewer for Marjo Volotinen thesis, 2009
Reviewer for Ranaa Al-Jamal thesis 2011

Lectures: Biology of Extracellular matrix, Kuopio 1996, Anatomici Fenniae, Orimattila 1998
Introduction to molecular cell biology, Kuopio 1999
Suomen Silmälääkäriyhdistyksen kokous, Silmätautien hoito nyt ja tulevaisuudessa, Kuopio 2003
Neurobiology of aging, Kuopio 2004
Nordic Ophthalmology Congress (NOK), Malmö 2004
European Association of Vision and Eye Research (EVER), Vilamoura, Portugal 2004
Silmätautien hoito nyt ja tulevaisuudessa, Tampere 2004
University of Kuopio VI Doctor Promotion, Kuopio 2005
European Association of Vision and Eye Research (EVER), Vilamoura, Portugal 2005
Nordic Ophthalmology Congress (NOK), Copenhagen 2006
European Association of Vision and Eye Research (EVER), Vilamoura, Portugal 2006 (organization and SIS chairman)
Itä-Suomen Lääketiedepäivät, Kuopio 2006
Macugen-Symposium, Helsinki 2006

European Association of Vision and Eye Research (EVER), Portoroz, Slovenia 2007 (organization and SIS chairman)
Tampereen Lääketiedepäivät, Tampere 2007
Lucentis-Symposium, Helsinki 2007
15th International Retina World Congress, Helsinki, 2008-07-12
European Association of Vision and Eye Research (EVER), Portoroz, Slovenia 2008 (lecture, organization and SIS chairman)
Tampereen lääketiedepäivät, Tampere 2009
European Association of Vision and Eye Research (EVER), Portoroz, Slovenia 2009 (lecture, organization and SIS chairman)
Baltic Forum, Vilnius, Litvinia 2010
Polish Ophthalmology Society, Warsaw, 2011
European Association of Vision and Eye Research (EVER), Portoroz, Slovenia 2010 (lecture, organization and SIS chairman)
New trends in treatment of corneal diseases” which will be held in Wisla, Poland on March 10-12, 2011.

INFLUENCE OF OWN RESEARCH

H-index 22, Over 100 total publication

The most cited articles:

[Hsp70 accumulation in chondrocytic cells exposed to high continuous hydrostatic pressure coincides with mRNA stabilization rather than transcriptional activation.](#)

Kaarniranta K, Elo M, Sironen R, Lammi MJ, Goldring MB, Eriksson JE, Sistonen L, Helminen HJ.
Proc Natl Acad Sci U S A. 1998 Mar 3;95(5):2319-24. **Cited: 104**

[cDNA array reveals mechanosensitive genes in chondrocytic cells under hydrostatic pressure.](#)

Sironen RK, Karjalainen HM, Elo MA, Kaarniranta K, Törrönen K, Takigawa M, Helminen HJ, Lammi MJ.
Biochim Biophys Acta. 2002 Aug 19;1591(1-3):45-54 **Cited: 36**

[Analysis of variants in the complement factor H, the elongation of very long chain fatty acids-like 4 and the hemicentin 1 genes of age-related macular degeneration in the Finnish population.](#)

Seitsonen S, Lemmelä S, Holopainen J, Tommila P, Ranta P, Kotamies A, Moilanen J, Palosaari T, Kaarniranta K, Meri S, Immonen I, Järvelä I.
Mol Vis. 2006 Jul 20;12:796-801. **Cited: 41**

[Activation of innate immunity system during aging: NF-kB signaling is the molecular culprit of inflamm-aging.](#)

Salminen A, Huuskonen J, Ojala J, Kauppinen A, Kaarniranta K, Suuronen T.
Ageing Res Rev. 2008 Apr;7(2):83-105. **Cited: 67**

[Terpenoids: natural inhibitors of NF-kappaB signaling with anti-inflammatory and anticancer potential.](#)

Salminen A, Lehtonen M, Suuronen T, Kaarniranta K, Huuskonen J.
Cell Mol Life Sci. 2008 Oct;65(19):2979-99. **Cited: 50**

[Crosstalk between Hsp70 molecular chaperone, lysosomes and proteasomes in autophagy-mediated proteolysis in human retinal pigment epithelial cells.](#)

Ryhänen T, Hyttinen JM, Kopitz J, Rilla K, Kuusisto E, Mannermaa E, Viiri J, Holmberg CI, Immonen I, Meri S, Parkkinen J, Eskelinen EL, Uusitalo H, Salminen A, Kaarniranta K.

J Cell Mol Med. 2009 Sep;13(9B):3616-31. **Cited: 25**

[Inflammation in Alzheimer's disease: amyloid-beta oligomers trigger innate immunity defence via pattern recognition receptors.](#)

Salminen A, Ojala J, Kauppinen A, Kaarniranta K, Suuronen T.

Prog Neurobiol. 2009 Feb;87(3):181-94. **Cited: 66**

LIST OF PUBLICATIONS

1. Articles in international journals using peer review

1. [Hsp70 accumulation in chondrocytic cells exposed to high continuous hydrostatic pressure coincides with mRNA stabilization rather than transcriptional activation.](#)

Kaarniranta K, Elo M, Sironen R, Lammi MJ, Goldring MB, Eriksson JE, Sistonen L, Helminen HJ.
Proc Natl Acad Sci U S A. 1998 Mar 3;95(5):2319-24.

2. [Stage-specific expression and cellular localization of the heat shock factor 2 isoforms in the rat seminiferous epithelium.](#)

Alastalo TP, Lönnström M, Leppä S, Kaarniranta K, Pelto-Huikko M, Sistonen L, Parvinen M.
Exp Cell Res. 1998 Apr 10;240(1):16-27.

3. [Protein synthesis is required for stabilization of hsp70 mRNA upon exposure to both hydrostatic pressurization and elevated temperature.](#)

Kaarniranta K, Holmberg CI, Helminen HJ, Eriksson JE, Sistonen L, Lammi MJ.
FEBS Lett. 2000 Jun 23;475(3):283-6.

4. [Transcriptional activation in chondrocytes submitted to hydrostatic pressure.](#)

Sironen R, Elo M, Kaarniranta K, Helminen HJ, Lammi MJ.
Biorheology. 2000;37(1-2):85-93.

5. [Differential regulation of stress proteins by high hydrostatic pressure, heat shock, and unbalanced calcium homeostasis in chondrocytic cells.](#)

Elo MA, Sironen RK, Kaarniranta K, Auriola S, Helminen HJ, Lammi MJ.
J Cell Biochem. 2000 Sep 14;79(4):610-9.

6. [Primary chondrocytes resist hydrostatic pressure-induced stress while primary synovial cells and fibroblasts show modified Hsp70 response.](#)

Kaarniranta K, Holmberg CI, Lammi MJ, Eriksson JE, Sistonen L, Helminen HJ.
Osteoarthritis Cartilage. 2001 Jan;9(1):7-13.

7. [Neuronal cells show regulatory differences in the hsp70 gene response.](#)

Kaarniranta K, Oksala N, Karjalainen HM, Suuronen T, Sistonen L, Helminen HJ, Salminen A, Lammi MJ.
Brain Res Mol Brain Res. 2002 May 30;101(1-2):136-40.

8. [High pressure effects on cellular expression profile and mRNA stability. A cDNA array analysis.](#)

Sironen RK, Karjalainen HM, Törrönen K, Elo MA, Kaarniranta K, Takigawa M, Helminen HJ, Lammi MJ.
Biorheology. 2002;39(1-2):111-7.

9. [cDNA array reveals mechanosensitive genes in chondrocytic cells under hydrostatic pressure.](#)

Sironen RK, Karjalainen HM, Elo MA, Kaarniranta K, Törrönen K, Takigawa M, Helminen HJ, Lammi MJ.
Biochim Biophys Acta. 2002 Aug 19;1591(1-3):45-54.

10. [Reperfusion but not acute ischemia in pig small intestine induces transcriptionally mediated heat shock response in situ.](#)
Oksala NK, Kaarniranta K, Tenhunen JJ, Tiihonen R, Heino A, Sistonen L, Paimela H, Alhava E.
Eur Surg Res. 2002 Nov-Dec;34(6):397-404.
11. [Stress responses of mammalian cells to high hydrostatic pressure.](#)
Kaarniranta K, Elo MA, Sironen RK, Karjalainen HM, Helminen HJ, Lammi MJ.
Biorheology. 2003;40(1-3):87-92.
12. [Gene expression profiles in chondrosarcoma cells subjected to cyclic stretching and hydrostatic pressure. A cDNA array study.](#)
Karjalainen HM, Sironen RK, Elo MA, Kaarniranta K, Takigawa M, Helminen HJ, Lammi MJ.
Biorheology. 2003;40(1-3):93-100.
13. [Specific induction of heat shock protein 90beta by high hydrostatic pressure.](#)
Elo MA, Sironen RK, Karjalainen HM, Kaarniranta K, Helminen HJ, Lammi MJ.
Biorheology. 2003;40(1-3):141-6.
14. [Visual recovery of the amblyopic eye in an adult patient after loss of the dominant eye.](#)
Kaarniranta K, Kontkanen M.
Acta Ophthalmol Scand. 2003 Oct;81(5):539. No abstract available.
15. [Hydrostatic pressure-induced changes in cellular protein synthesis.](#)
Lammi MJ, Elo MA, Sironen RK, Karjalainen HM, Kaarniranta K, Helminen HJ.
Biorheology. 2004;41(3-4):309-13. Review.
16. [Hsp90 inhibitor geldanamycin increases hsp70 mRNA stabilisation but fails to activate HSF1 in cells exposed to hydrostatic pressure.](#)
Elo MA, Kaarniranta K, Helminen HJ, Lammi MJ.
Biochim Biophys Acta. 2005 Mar 22;1743(1-2):115-9.
17. [Geldanamycin increases 4-hydroxynonenal \(HNE\)-induced cell death in human retinal pigment epithelial cells.](#)
Kaarniranta K, Ryhänen T, Karjalainen HM, Lammi MJ, Suuronen T, Huhtala A, Kontkanen M, Teräsvirta M, Uusitalo H, Salminen A.
Neurosci Lett. 2005 Jul 1-8;382(1-2):185-90. Epub 2005 Apr 14.
18. [Geldanamycin activates Hsp70 response and attenuates okadaic acid-induced cytotoxicity in human retinal pigment epithelial cells.](#)
Kaarniranta K, Ryhänen T, Sironen RK, Suuronen T, Elo MA, Karjalainen HM, Lammi MJ, Teräsvirta M, Uusitalo H, Salminen A.
Brain Res Mol Brain Res. 2005 Jun 13;137(1-2):126-31. Epub 2005 Apr 7.
19. [A mouse model for Stickler's syndrome: ocular phenotype of mice carrying a targeted heterozygous inactivation of type II \(pro\)collagen gene \(Col2a1\).](#)
Kaarniranta K, Ihanamäki T, Sahlman J, Pulkkinen H, Uusitalo H, Arita M, Tammi R, Lammi MJ, Helminen HJ.
Exp Eye Res. 2006 Aug;83(2):297-303. Epub 2006 Mar 20.
20. [Analysis of variants in the complement factor H, the elongation of very long chain fatty acids-like 4 and the hemicentin 1 genes of age-related macular degeneration in the Finnish population.](#)
Seitsonen S, Lemmelä S, Holopainen J, Tommila P, Ranta P, Kotamies A, Moilanen J, Palosaari T, Kaarniranta K, Meri S, Immonen I, Järvelä I.
Mol Vis. 2006 Jul 20;12:796-801.
21. [Matrix metalloproteinases and their inhibitors in the chamber angle of normal eyes and patients with primary open-angle glaucoma and exfoliation glaucoma.](#)
Rönkkö S, Rekonen P, Kaarniranta K, Puustjärvi T, Teräsvirta M, Uusitalo H.
Graefes Arch Clin Exp Ophthalmol. 2007 May;245(5):697-704. Epub 2006 Oct 7.
22. [Immunolocalization of EMMPRIN \(CD147\) in the human eye and detection of soluble form of EMMPRIN in ocular fluids.](#)
Määttä M, Tervahartiala T, Kaarniranta K, Tang Y, Yan L, Tuukkanen J, Sorsa T.
Curr Eye Res. 2006 Nov;31(11):917-24.

23. [Maculopathy in Pierre Robin sequences.](#)
Kaarniranta K, Tuppurainen K, Nikolajev K.
J Pediatr Ophthalmol Strabismus. 2007 Jan-Feb;44(1):10-1. No abstract available.
24. [Alpha-lipoic Acid modulates heat shock factor-1 expression in streptozotocin-induced diabetic rat kidney.](#)
Oksala NK, Lappalainen J, Laaksonen DE, Khanna S, Kaarniranta K, Sen CK, Atalay M.
Antioxid Redox Signal. 2007 Apr;9(4):497-506.
25. [Leucine 7-proline 7 polymorphism in the signal peptide of neuropeptide Y is not a risk factor for exudative age-related macular degeneration.](#)
Kaarniranta K, Holopainen JM, Karvonen MK, Koulu M, Kallio J, Pesonen U, Teräsvirta M, Uusitalo H, Immonen I.
Acta Ophthalmol Scand. 2007 Mar;85(2):188-91.
26. [Corneal epithelium as a platform for secretion of transgene products after transfection with liposomal gene eyedrops.](#)
Toropainen E, Hornof M, Kaarniranta K, Johansson P, Urtti A.
J Gene Med. 2007 Mar;9(3):208-16.
27. [Imiquimod in the treatment of eyelid basal cell carcinoma.](#)
Leppälä J, Kaarniranta K, Uusitalo H, Kontkanen M.
Acta Ophthalmol Scand. 2007 Aug;85(5):566-8. Epub 2007 Mar 22.
28. [Phospholipase A2 in chamber angle of normal eyes and patients with primary open angle glaucoma and exfoliation glaucoma.](#)
Rönkkö S, Rekonen P, Kaarniranta K, Puustjarvi T, Teräsvirta M, Uusitalo H.
Mol Vis. 2007 Mar 26;13:408-17.
29. [Phospholipase A2 in chamber angle of normal eyes and patients with primary open angle glaucoma and exfoliation glaucoma.](#)
Rönkkö S, Rekonen P, Kaarniranta K, Puustjarvi T, Teräsvirta M, Uusitalo H.
Mol Vis. 2007 Mar 26;13:408-17.
30. [Epigenetic regulation of clusterin/apolipoprotein J expression in retinal pigment epithelial cells.](#)
Suuronen T, Nuutinen T, Ryhänen T, Kaarniranta K, Salminen A.
Biochem Biophys Res Commun. 2007 Jun 1;357(2):397-401. Epub 2007 Apr 3.
31. [In vitro biocompatibility of degradable biopolymers in cell line cultures from various ocular tissues: direct contact studies.](#)
Huhtala A, Pohjonen T, Salminen L, Salminen A, Kaarniranta K, Uusitalo H.
J Biomed Mater Res A. 2007 Nov;83(2):407-13.
32. [The effect of 17beta-estradiol on IL-6 secretion and NF-kappaB DNA-binding activity in human retinal pigment epithelial cells.](#)
Paimela T, Ryhänen T, Mannermaa E, Ojala J, Kalesnykas G, Salminen A, Kaarniranta K.
Immunol Lett. 2007 Jun 15;110(2):139-44. Epub 2007 May 21.
33. [In vitro biocompatibility of degradable biopolymers in cell line cultures from various ocular tissues: extraction studies.](#)
Huhtala A, Pohjonen T, Salminen L, Salminen A, Kaarniranta K, Uusitalo H.
J Mater Sci Mater Med. 2008 Feb;19(2):645-9. Epub 2007 Jul 10.
34. [Activation of innate immunity system during aging: NF-kB signaling is the molecular culprit of inflamm-aging.](#)
Salminen A, Huuskonen J, Ojala J, Kauppinen A, Kaarniranta K, Suuronen T.
Ageing Res Rev. 2008 Apr;7(2):83-105. Epub 2007 Sep 20. Review.
35. [The expression of heat shock protein 27 in retinal ganglion and glial cells in a rat glaucoma model.](#)
Kalesnykas G, Niittykoski M, Rantala J, Miettinen R, Salminen A, Kaarniranta K, Uusitalo H.
Neuroscience. 2007 Dec 12;150(3):692-704. Epub 2007 Oct 11.

36. [Interaction of aging-associated signaling cascades: inhibition of NF-kappaB signaling by longevity factors FoxOs and SIRT1.](#)
Salminen A, Ojala J, Huuskonen J, Kauppinen A, Suuronen T, Kaarniranta K.
Cell Mol Life Sci. 2008 Apr;65(7-8):1049-58. Review.
37. [NEMO shuttle: a link between DNA damage and NF-kappaB activation in progeroid syndromes?](#)
Salminen A, Suuronen T, Huuskonen J, Kaarniranta K.
Biochem Biophys Res Commun. 2008 Mar 21;367(4):715-8. Epub 2008 Jan 15. Review.
38. [Innate immunity meets with cellular stress at the IKK complex: regulation of the IKK complex by HSP70 and HSP90.](#)
Salminen A, Paimela T, Suuronen T, Kaarniranta K.
Immunol Lett. 2008 Apr 15;117(1):9-15. Epub 2008 Feb 1. Review.
39. [Regulation of ER alpha signaling pathway in neuronal HN10 cells: role of protein acetylation and Hsp90.](#)
Suuronen T, Ojala J, Hyttinen JM, Kaarniranta K, Thornell A, Kyrylenko S, Salminen A.
Neurochem Res. 2008 Sep;33(9):1768-75. Epub 2008 Feb 29.
40. [Radical but not geldanamycin evokes oxidative stress response and efflux protein inhibition in ARPE-19 human retinal pigment epithelial cells.](#)
Ryhänen T, Mannermaa E, Oksala N, Viiri J, Paimela T, Salminen A, Atalay M, Kaarniranta K.
Eur J Pharmacol. 2008 Apr 28;584(2-3):229-36. Epub 2008 Feb 14.
41. [Histopathology of the three implanted degradable biopolymers in rabbit eye.](#)
Rönkkö S, Rekonen P, Sihvola R, Kaarniranta K, Puustjärvi T, Teräsvirta M, Uusitalo H.
J Biomed Mater Res A. 2009 Mar 1;88(3):717-24.
42. [ROCK, PAK, and Toll of synapses in Alzheimer's disease.](#)
Salminen A, Suuronen T, Kaarniranta K.
Biochem Biophys Res Commun. 2008 Jul 11;371(4):587-90. Epub 2008 May 6. Review.
43. [Terpenoids: natural inhibitors of NF-kappaB signaling with anti-inflammatory and anticancer potential.](#)
Salminen A, Lehtonen M, Suuronen T, Kaarniranta K, Huuskonen J.
Cell Mol Life Sci. 2008 Oct;65(19):2979-99. Review.
44. [Retinal haemorrhages in shaken baby syndrome.](#)
Kontkanen M, Kaarniranta K.
Acta Ophthalmol. 2009 Jun;87(4):471-3. Epub 2008 Jul 8. No abstract available.
45. [Single nucleotide polymorphisms of the tenomodulin gene \(TNMD\) in age-related macular degeneration.](#)
Tolppanen AM, Nevalainen T, Kolehmainen M, Seitsonen S, Immonen I, Uusitupa M, Kaarniranta K, Pulkkinen L.
Mol Vis. 2009;15:762-70. Epub 2009 Apr 15.
46. [Regulation of the aging process by autophagy.](#)
Salminen A, Kaarniranta K.
Trends Mol Med. 2009 May;15(5):217-24. Epub 2009 Apr 18. Review.
47. [Heat shock proteins as gatekeepers of proteolytic pathways-Implications for age-related macular degeneration \(AMD\).](#)
Kaarniranta K, Salminen A, Eskelinen EL, Kopitz J.
Ageing Res Rev. 2009 Apr;8(2):128-39. Review.
48. [SIRT1: regulation of longevity via autophagy.](#)
Salminen A, Kaarniranta K.
Cell Signal. 2009 Sep;21(9):1356-60. Epub 2009 Feb 26.
49. [Multifactor effects and evidence of potential interaction between complement factor H Y402H and LOC387715 A69S in age-related macular degeneration.](#)
Seitsonen SP, Onkamo P, Peng G, Xiong M, Tommila PV, Ranta PH, Holopainen JM, Moilanen JA, Palosaari T, Kaarniranta K, Meri S, Immonen IR, Järvelä IE.
PLoS One. 2008;3(12):e3833. Epub 2008 Dec 2.

50. [Crosstalk between Hsp70 molecular chaperone, lysosomes and proteasomes in autophagy-mediated proteolysis in human retinal pigment epithelial cells.](#)
Ryhänen T, Hyttinen JM, Kopitz J, Rilla K, Kuusisto E, Mannermaa E, Viiri J, Holmberg CI, Immonen I, Meri S, Parkkinen J, Eskelinen EL, Uusitalo H, Salminen A, Kaarniranta K. *J Cell Mol Med.* 2009 Sep;13(9B):3616-31.
51. [SIRT1 regulates the ribosomal DNA locus: epigenetic candles twinkle longevity in the Christmas tree.](#)
Salminen A, Kaarniranta K.
Biochem Biophys Res Commun. 2009 Jan 2;378(1):6-9. Epub 2008 Nov 21. Review.
52. [Age-related macular degeneration: activation of innate immunity system via pattern recognition receptors.](#)
Kaarniranta K, Salminen A.
J Mol Med. 2009 Feb;87(2):117-23. Epub 2008 Nov 14.
53. [Pharmacokinetics, efficacy and safety profiles of preserved and preservative-free tafluprost in healthy volunteers.](#)
Uusitalo H, Kaarniranta K, Ropo A.
Acta Ophthalmol Suppl (Oxf). 2008;242:7-13.
54. [SIRT1 longevity factor suppresses NF-kappaB -driven immune responses: regulation of aging via NF-kappaB acetylation?](#)
Salminen A, Kauppinen A, Suuronen T, Kaarniranta K.
Bioessays. 2008 Oct;30(10):939-42.
55. [Amyloid-beta oligomers set fire to inflammasomes and induce Alzheimer's pathology.](#)
Salminen A, Ojala J, Suuronen T, Kaarniranta K, Kauppinen A.
J Cell Mol Med. 2008 Dec;12(6A):2255-62. Epub 2008 Sep 13. Review.
56. [Efflux protein expression in human retinal pigment epithelium cell lines.](#)
Mannermaa E, Vellonen KS, Ryhänen T, Kokkonen K, Ranta VP, Kaarniranta K, Urtti A.
Pharm Res. 2009 Jul;26(7):1785-91. Epub 2009 Apr 21.
57. [Inflammation in Alzheimer's disease: amyloid-beta oligomers trigger innate immunity defence via pattern recognition receptors.](#)
Salminen A, Ojala J, Kauppinen A, Kaarniranta K, Suuronen T.
Prog Neurobiol. 2009 Feb;87(3):181-94. Review.
58. [Siglec receptors and hiding plaques in Alzheimer's disease.](#)
Salminen A, Kaarniranta K.
J Mol Med. 2009 Jul;87(7):697-701. Epub 2009 Apr 24.
59. [NF-kappaB signaling in the aging process.](#)
Salminen A, Kaarniranta K.
J Clin Immunol. 2009 Jul;29(4):397-405. Epub 2009 May 1.
60. [Influence of selective estrogen receptor modulators on interleukin-6 expression in human retinal pigment epithelial cells \(ARPE-19\).](#)
Paimela T, Hyttinen JM, Viiri J, Ryhänen T, Karvonen MK, Unkila M, Uusitalo H, Salminen A, Kaarniranta K.
Eur J Pharmacol. 2010 Aug 25;640(1-3):219-25.
61. [Switching from a preserved to a preservative-free prostaglandin preparation in topical glaucoma medication.](#)
Uusitalo H, Chen E, Pfeiffer N, Brignole-Baudouin F, Kaarniranta K, Leino M, Puska P, Palmgren E, Hamacher T, Hofmann G, Petzold G, Richter U, Riedel T, Winter M, Ropo A.
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