

Curriculum Vitae

Personal information **Kati-Sisko Vellonen**

Work experience

8.2025 - present, **University Teacher**, School of Pharmacy, University of Eastern Finland, Finland.

My main responsibilities include teaching Bachelor's and Master's students in pharmacy. In addition, I participate in basic research within the Ocular Drug Delivery research group.

7.2017 – 7.2025, **University Researcher**, School of Pharmacy, University of Eastern Finland, Finland.

My main activities included the development and application of analytical methods (e.g., mass spectrometry, HPLC, ELISA) for the quantification of drugs and related compounds in drug delivery and pharmacokinetics research. I was also actively involved in teaching and academic supervision in the field of biopharmacy, guiding both Ph.D. and Master's students in their research and scientific writing.

3.2012 – 4.2017, **Postdoctoral Researcher**, School of Pharmacy, University of Eastern Finland, Finland.

My postdoctoral research focused on the distribution of drugs from systemic circulation into the eye, and on how Alzheimer's disease affects drug distribution to the brain. The work was partly funded by a personal grant from the Finnish Cultural Foundation.

10.2010 - 2.2012, Postdoctoral Researcher, Division of Biopharmacy and Pharmacokinetics, University of Helsinki, Finland.

Main activities included developing a pharmacokinetic model of the blood-brain barrier to support drug discovery and development.

5.2006 – 10.2010, **Doctoral student**, Drug Discovery Technology Center (DDTC), University of Helsinki, Finland;
2.2001 – 4.2006, **Doctoral student**, Department of Pharmaceutics, University of Kuopio, Finland.

Main activities as a doctoral student included studying drug transport in the corneal epithelium using cell models. The research, conducted at two universities, involved permeability assays, cell uptake and efflux studies, RNA and protein expression analysis, cytotoxicity testing, and pharmacokinetic modeling.

Education and training

2.2001 – 12.2010, **Doctor of Science** (Pharmacy), University of Helsinki, Finland.

Doctoral studies covered biopharmacy with a focus on drug transport, cell-based models, and pharmacokinetic analysis.

8.1995 - 3.2001, **Master of Science** (Pharmacy), University of Kuopio, Finland.

Master's studies in pharmacy with a major subject in biopharmacy.

Additional information

Publications

1. Pilipenko I, Sorsa T, Valtari A, Posio S, **Vellonen KS**, Subrizi A, Hietala S, Ruponen M, Urtti A: Thermoresponsive Hydrogels with Tunable Viscoelasticity for Extended Ocular Drug Delivery. *Biomacromolecules*. 26(6):3721-3731, 2025. doi: 10.1021/acs.biomac.5c00292.
2. Sinokki A, Miinalainen A, Kivioja S, Kiander W, **Vellonen KS**, Bhattacharya M, Gynther M, Huttunen K, Auriola S, Niemi M, Kidron H: In Vitro Characterization of SLCO2B1 Genetic Variants. *J Pharm Sci*. 114(6):103772, 2025. doi: org/10.1016/j.xphs.2025.103772
3. Sjöstedt N, Timmermans RGM, Vieraankivi M, Suominen L, **Vellonen KS**, Bhattacharya M, Auriola S, Kidron H: Exploring the effect of intracellular loop 1 genetic variants in human ABCG2 on transport activity and protein abundance. *Drug Metab. Pharmacokinet.* 62:101482, 2025. doi: 10.1016/j.dmpk.2025.101482
4. Valtari A, Kalinin S, Jäntti J, Vanhanen P, Hanzlikova M, Tonduru A, Stenberg K, Viitala T, **Vellonen KS**, Toropainen E, Ruponen M, Urtti A. Melanin-Binding-Based Discovery of Topically Instilled Carbonic Anhydrase Inhibitors for Targeted Delivery and Prolonged Action in the Eye. *Mol Pharm.* 22(2):721-732, 2025. doi: 10.1021/acs.molpharmaceut.4c00694.

5. Merivaara A, Puranen J, Sadeghi A, Zashikhina N, Pirskanen L, Lajunen T, Terasaki T, Auriola S, **Vellonen KS**, Urtti A. Barcode lipids for absolute quantitation of liposomes in ocular tissues. *J Control Release*. 370:1-13, 2024. doi: 10.1016/j.jconrel.2024.04.023.
6. Valtari A, Posio S, Toropainen E, Balla A, Puranen J, Sadeghi A, Ruponen M, Ranta VP, **Vellonen KS**, Urtti A, Amo EMD. Comprehensive ocular and systemic pharmacokinetics of dexamethasone after subconjunctival and intravenous injections in rabbits. *Eur J Pharm Biopharm*. 198:114260, 2024. doi: 10.1016/j.ejpb.2024.114260.
7. Järvinen J, Montaser AB, Adla SK, Leppänen J, Lehtonen M, **Vellonen KS**, Laitinen T, Jalkanen A, Elmquist WF, Timonen J, Huttunen KM, Rautio J. Altering distribution profile of palbociclib by its prodrugs. *Eur J Pharm Sci*. 192:106637, 2024. doi: 10.1016/j.ejps.2023.106637.
8. Hammid A, Fallon JK, **Vellonen KS**, Lassila T, Reinisalo M, Urtti A, Gonzalez F, Tolonen A, Smith PC, Honkakoski P. Aldehyde oxidase 1 activity and protein expression in human, rabbit, and pig ocular tissues. *Eur J Pharm Sci*. 191:106603, 2023. doi: 10.1016/j.ejps.2023.106603.
9. Del Amo EM, **Vellonen KS**, Urtti A, Terasaki T, Hammid A, Honkakoski P, Auriola S. Mass spectrometry in ocular drug research. *Mass Spectrom Rev*. 2023. doi: 10.1002/mas.21861
10. Suominen L, Sjöstedt N, **Vellonen KS**, Gynther M, Auriola S, Kidron H. In vitro identification of decreased function phenotype ABCG2 variants. *Eur J Pharm Sci*. 188:106527, 2023. doi: 10.1016/j.ejps.2023.106527.
11. Häkkinen K, Kiander W, Kidron H, Lähteenvuori M, Urpa L, Lintunen J, **Vellonen KS**, Auriola S, Holm M, Lahdensuo K, Kampman O, Isometsä E, Kieseppä T, Lönnqvist J, Suvisaari J, Hietala J, Tiihonen J, Palotie A, Ahola-Olli AV, Niemi M. Functional Characterization of Six SLC01B1 (OATP1B1) Variants Observed in Finnish Individuals with a Psychotic Disorder. *Mol Pharm*. 20(3):1500-1508, 2023. doi: 10.1021/acs.molpharmaceut.2c00715.
12. Hellinen L, Hongisto H, Ramsay E, Kaarniranta K, **Vellonen KS**, Skottman H, Ruponen M. Comparison of barrier properties of outer blood-retinal barrier models - Human stem cell-based models as a novel tool for ocular drug discovery. *Eur J Pharm Biopharm*. 184:181-188, 2023. doi: 10.1016/j.ejpb.2023.01.026.
13. Balla A, Tran B, Valtari A, Steven P, Scarpellini C, Augustyns K, Urtti A, **Vellonen KS**, Ruponen M. A Novel Ferroptosis Inhibitor UAMC-3203, a Potential Treatment for Corneal Epithelial Wound. *Pharmaceutics*. 15(1):118, 2022. doi: 10.3390/pharmaceutics15010118.
14. Kiander W, Sjöstedt N, Manninen R, Jaakkonen L, **Vellonen KS**, Neuvonen M, Niemi M, Auriola S, Kidron H. Functional in vitro characterization of SLC01B1 variants and simulation of the clinical pharmacokinetic impact of impaired OATP1B1 function. *Eur J Pharm Sci*. 176:106246, 2022. doi: 10.1016/j.ejps.2022.106246.
15. Balla A, Ruponen M, Valtari A, Toropainen E, Tuomainen M, Alvarez-Lorenzo C, Del Amo EM, Urtti A, **Vellonen KS**. Understanding dexamethasone kinetics in the rabbit tear fluid: drug release and clearance from solution, suspension and hydrogel formulations. *Eur J Pharm Biopharm*. 172:53-60, 2022. doi: 10.1016/j.ejpb.2022.01.005.
16. Kiander W, **Vellonen KS**, Malinen MM, Gynther M, Hagström M, Bhattacharya M, Auriola S, Koenderink JB, Kidron H. The Effect of Single Nucleotide Variations in the Transmembrane Domain of OATP1B1 on in vitro Functionality. *Pharm Res*. 38(10):1663-1675, 2021
17. Fayyaz A, **Vellonen KS**, Ranta VP, Toropainen E, Reinisalo M, Valtari A, Puranen J, Ricci GD, Heikkinen EM, Gardner I, Ruponen M, Urtti A, Jamei M, Del Amo EM. Ocular pharmacokinetics of atenolol, timolol and betaxolol cocktail: Tissue exposures in the rabbit eye. *Eur J Pharm Biopharm*. 166:155-162, 2021
18. Balla A, Auriola S, Grey AC, Demarais NJ, Valtari A, Heikkinen EM, Toropainen E, Urtti A, **Vellonen KS**, Ruponen M. Partitioning and Spatial Distribution of Drugs in Ocular Surface Tissues. *Pharmaceutics*. 3(5):658, 2021
19. Toropainen E, Fraser-Miller SJ, Novakovic D, Del Amo EM, **Vellonen KS**, Ruponen M, Viitala T, Korhonen O, Auriola S, Hellinen L, Reinisalo M, Tengvall U, Choi S, Absar M, Strachan C, Urtti A. Biopharmaceutics of Topical Ophthalmic Suspensions: Importance of Viscosity and Particle Size in Ocular Absorption of Indomethacin. *Pharmaceutics*. 13(4):452, 2021.
20. Fayyaz A, Ranta VP, Toropainen E, **Vellonen KS**, Valtari A, Puranen J, Ruponen M, Gardner I, Urtti A, Jamei M, Del Amo EM. Topical ocular pharmacokinetics and bioavailability for a cocktail of atenolol, timolol and betaxolol in rabbits. *Eur J Pharm Sci*. 155:105553, 2020.
21. Kilpeläinen TP, Hellinen L, Vrijdag J, Yan X, Svarcbaš 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. *Biomed Pharmacother*. 128:110253, 2020

22. Heikkinen E, Ruponen M, Jasper LM, Leppänen J, Hellinen L, Urtti A, Auriola S, Rautio J, **Vellonen KS**. Prodrug approach for posterior eye drug delivery: synthesis of novel ganciclovir prodrugs and in vitro screening with cassette dosing. *Mol Pharm*. 17(6):1945-1953, 2020
23. Fayyaz A, Ranta VP, Toropainen E, **Vellonen KS**, Ricci GD, Reinisalo M, Heikkinen EM, Gardner I, Urtti A, Jamei M, Del Amo EM. Ocular Intracameral Pharmacokinetics for a Cocktail of Timolol, Betaxolol, and Atenolol in Rabbits. *Mol Pharm*. 17(2):588-594, 2020
24. Huttunen J, Gynther M, **Vellonen KS**, Huttunen KM: L-Type Amino Acid Transporter 1 (LAT1)-Utilizing Prodrugs Are Carrier-Selective Despite Having Low Affinity for Organic Anion Transporting Polypeptides (OATPs). *Int J Pharm* 571:118714, 2019
25. Huttunen J, Peltokangas S, Gynther M, Natunen T, Hiltunen M, Auriola S, Ruponen M, **Vellonen KS**, Huttunen KM: L-Type Amino Acid Transporter 1 (LAT1/Lat1)-Utilizing Prodrugs Can Improve the Delivery of Drugs into Neurons, Astrocytes and Microglia. *Sci Rep* 9(1):12860, 2019
26. Schmitt M, Hippeläinen E, Raviña M, Arango-Gonzalez B, Antopolsky M, **Vellonen KS**, Airaksinen AJ, Urtti A: Intravitreal Pharmacokinetics in Mice: SPECT/CT Imaging and Scaling to Rabbits and Humans. *Mol Pharm*. 16(10):4399-4404, 2019
27. Ramsay E, Hagström M, **Vellonen KS**, Boman S, Toropainen E, Del Amo EM, Kidron H, Urtti A, Ruponen M: Role of retinal pigment epithelium permeability in drug transfer between posterior eye segment and systemic blood circulation. *Eur J Pharm Biopharm* 143:18-23, 2019
28. Heikkinen EM, Auriola S, Ranta VP, Demarais NJ, Grey AC, Del Amo EM, Toropainen E, **Vellonen KS**, Urtti A, Ruponen M: Distribution of small molecular weight drugs into the porcine lens: studies on imaging mass spectrometry, distribution coefficients, and implications in ocular pharmacokinetics. *Mol Pharm*. 16(9):3968-3976, 2019
29. Gynther M, Puris E, Peltokangas S, Auriola S, Kanninen KM, Koistinaho J, Huttunen KM, Ruponen M, **Vellonen KS**: Alzheimer's Disease Phenotype or Inflammatory Insult Does Not Alter Function of L-Type Amino Acid Transporter 1 in Mouse Blood-Brain Barrier and Primary Astrocytes. *Pharm Res* 36: 17, 2018
30. Heikkinen EM, Del Amo EM, Ranta VP, Urtti A, **Vellonen KS**, Ruponen M: Esterase activity in porcine and albino rabbit ocular tissues. *Eur J Pharm Sci* 123: 106-110, 2018
31. **Vellonen KS**, Hellinen L, Mannermaa E, Ruponen M, Urtti A, Kidron H: Expression, activity and pharmacokinetic impact of ocular transporters. *Adv Drug Deliv Rev* 26: 3-22, 2018
32. **Vellonen KS**, Ihalainen J, Boucau MC, Gosselet F, Picardat T, Gynther M, Kanninen KM, White AR, Malm T, Koistinaho J, Forsberg MM, Ruponen M: Disease-Induced Alterations in Brain Drug Transporters in Animal Models of Alzheimer's Disease. *Pharm Res* 34: 2652-2662, 2017
33. Del Amo EM, Rimpelä AK, Heikkinen E, Kari OK, Ramsay E, Lajunen T, Schmitt M, Pelkonen L, Bhattacharya M, Richardson D, Subrizi A, Turunen T, Reinisalo M, Itkonen J, Toropainen E, Casteleijn M, Kidron H, Antopolsky M, **Vellonen KS**, Ruponen M, Urtti A: Pharmacokinetic aspects of retinal drug delivery. *Prog Retin Eye Res* 57: 134-185, 2017
34. Rönkkö S, **Vellonen KS**, Järvinen K, Toropainen E, Urtti A: Human corneal cell culture models for drug toxicity studies. *Drug Deliv Transl Res* 6: 660-675, 2016
35. **Vellonen KS**, Soini EM, Del Amo EM, Urtti A: Prediction of ocular drug distribution from systemic blood circulation. *Mol Pharm* 13: 2906-2911, 2016
36. Soininen SK, **Vellonen KS**, Heikkinen AT, Auriola S, Ranta V P, Urtti A, Ruponen M: Intracellular PK/PD relationships of free and liposomal doxorubicin: Quantitative analyses and PK/PD modeling. *Mol Pharm* 13: 1358-1365, 2016
37. Küblbeck J, Hakkarainen J, Petsalo A, **Vellonen KS**, Tolonen A, Reponen P, Forsberg, Honkakoski P: Genetically modified Caco-2 cells with improved CYP metabolic capacity. *J Pharm Sci* 105:941-949, 2016
38. Del Amo EM, **Vellonen KS**, Kidron H, Urtti A: Intravitreal clearance and volume of distribution of compounds in rabbits: In silico prediction and pharmacokinetic simulations for drug development. *Eur J Pharm Biopharm* 95(Pt B): 215-226, 2015
39. **Vellonen KS**, Malinen M, Mannermaa E, Subrizi A, Toropainen E, Lou YR, Kidron H, Yliperttula M, Urtti A: A critical assessment of in vitro tissue models for ADME and drug delivery. *J Control Release* 190: 94-114, 2014

40. Sjöstedt N, Kortejärvi H, Kidron H, **Vellonen KS**, Urtti A, Yliperttula M: Challenges of using in vitro data for modeling P-glycoprotein efflux in the blood-brain barrier. *Pharm Res* 31: 1-19, 2014
41. Kidron H, Del Amo EM, **Vellonen KS**, Urtti A: Prediction of the vitreal half-life of small molecular drug-like compounds. *Pharm Res* 29: 3302-3311, 2012
42. Greco D, **Vellonen KS**, Turner HC, Häkli M, Tervo T, Auvinen P, Wolosin JM, Urtti A: Gene expression analysis in SV-40 immortalized human corneal epithelial cells cultured with an air-liquid interface. *Mol Vis* 16: 2109-2120, 2010
43. Wang Z, Reinach PS, Zhang F, **Vellonen KS**, Urtti A, Turner H, Wolosin J M: DUSP5 and DUSP6 modulate corneal epithelial cell proliferation. *Mol Vis* 16: 1696-1704, 2010
44. Kidron H, **Vellonen KS**, Tissari A, Del Amo E, Urtti A: Prediction of corneal permeability of drug-like compounds. *Pharm Res* 27: 1398-407, 2010
45. Mannermaa E, Reinisalo M, Ranta VP, **Vellonen KS**, Kokki H, Saarikko A, Kaarniranta K, Urtti A: Filter-cultured ARPE-19 cells as outer blood-retinal barrier model. *Eur J Pharm Sci* 40: 289-296, 2010
46. **Vellonen KS**, Häkli M, Merezhinskaya N, Tervo T, Honkakoski P, Urtti A: Monocarboxylate transporters in human corneal epithelium and cell lines. *Eur J Pharm Sci* 39: 241-247, 2010
47. **Vellonen KS**, Mannermaa E, Turner H, Häkli M, Wolosin J M, Tervo T, Honkakoski P, Urtti A: Effluxing ABC transporters in human corneal epithelium. *J Pharm Sci* 99: 1087-1098, 2010
48. Mannermaa E, **Vellonen KS**, Ryhänen T, Kokkonen K, Ranta VP, Kaarniranta K, Urtti A: Efflux protein expression in human retinal pigment epithelium cell lines. *Pharm Res* 26: 1785-1791, 2009
49. Siissalo S, Laitinen L, Koljonen M, **Vellonen KS**, Kortejärvi H, Urtti A, Hirvonen J, Kaukonen AM: Effect of cell differentiation and passage number on the expression of efflux proteins in wild type and vinblastine-induced Caco-2 cell lines. *Eur J Pharm Biopharm* 67: 548-554, 2007
50. Mannermaa E, **Vellonen KS**, Urtti A: Drug transport in corneal epithelium and blood-retina barrier: emerging role of transporters in ocular pharmacokinetics. *Adv Drug Deliv Rev*. 58: 1136-1163, 2006
51. **Vellonen KS**, Honkakoski P, Urtti A: Substrates and inhibitors of efflux proteins interfere with the MTT assay in cells and may lead to underestimation of drug toxicity. *Eur J Pharm Sci* 23: 181-188, 2004
52. Ranta VP, Laavola M, Toropainen E, **Vellonen KS**, Talvitie A, Urtti A: Ocular pharmacokinetic modeling using corneal absorption and desorption rates from in vitro permeation experiments with cultured corneal epithelial cells. *Pharm Res* 20: 1409-1416, 2003
53. Tavelin S, Taipalensuu J, Hallbook F, **Vellonen KS**, Moore V, Artursson P: An improved cell culture model based on 2/4/A1 cell monolayers for studies of intestinal drug transport: characterization of transport routes. *Pharm Res* 20: 373-381, 2003
54. Toropainen E, Ranta VP, **Vellonen KS**, Palmgren J, Talvitie A, Laavola M, Suhonen P, Hämäläinen KM, Auriola S, Urtti A: Paracellular and passive transcellular permeability in immortalized human corneal epithelial cell culture model. *Eur J Pharm Sci* 20: 99-106, 2003

Projects

Research funding:

Finnish Cultural Foundation, Elli Turunen Fund: €28 000, personal postdoctoral grant (2016)

Academy of Finland: €280 513, research funding for postdoctoral project (2012)

Doctoral student position in the Graduate School in Pharmaceutical Research (2002–2005)

Memberships

Guest Editor for the Special Issue on Ocular Drug Delivery in the *European Journal of Pharmaceutical Sciences* (2024-2025)

Other Relevant Information

Awarded the title of Docent (Adjunct Professor) in Preclinical Pharmacokinetics and Biopharmaceutics by University of Eastern Finland in July 2020, in recognition of scientific expertise and teaching qualifications in the field.