

Dr. rer. nat. Maren Katherina Preis

Curriculum Vitae

2004 - 2009	<u>Pharmacy studies</u> - Heinrich-Heine University, Düsseldorf, Germany
2009	Graduate R&D Intern - Pharmaceutical & Medical Chemistry, Heinrich-Heine University, Düsseldorf, Germany
2009 - 2010	<u>Pharmacy trainee</u> to obtain German Pharmacist License, Marien Apotheke, Neuss, Germany
2010 - 2014	<u>PhD Candidate</u> - Institute of Pharmaceutics and Biopharmaceutics, Heinrich-Heine University, Düsseldorf, Germany
2010 - 2013	<u>Certification as Specialist for Pharmaceutical Technology</u> - Chamber of Pharmacists, Germany
2012 - 2015	<u>Formulation Scientist</u> - Sapiotec GmbH, Würzburg, Germany
2014 - 2015	<u>Postdoctoral Researcher and Guest Lecturer</u> - Institute of Pharmaceutics and Biopharmaceutics, Heinrich-Heine University, Düsseldorf, Germany
2015 -	<u>Project Researcher and Supervisor on B.Sc., M.Sc. and PhD level</u> - Pharmaceutical Sciences Laboratory, Åbo Akademi University, Turku, Finland
2017	<u>Proprietor</u> - Letaform, Turku, Finland

Research areas & focus

Innovative Drug Delivery & Dosage Form Development
Oral Delivery of Medicinal Products and Food Supplements
Age-appropriate / Paediatric Dosage Forms
Oromucosal Film Preparations // Orodispersible and Buccal Films
Characterization of oral dosage forms // Development of new test methods
Taste-Masking Strategies and in-vitro Assessment (electronic tongues)
Printing Technologies for the Fabrication of Drug Delivery Systems (2D & 3D printing)

Awards, Prices & Honors

2016	Most Outstanding Doctoral Thesis in Pharmaceutical Sciences in the Academic Years 2014/2015 - Awarded at the PBP World Meeting in Glasgow
2015	Award: Preis für Pharma Technik 2014 (Publication awarded: Application of Electronic Tongues in Preformulation Studies) PharmInd (German Journal for the Pharmaceutical Industry)
2014	Nomination for the Most Outstanding Thesis of the Faculty of Mathematical & Natural Sciences (Top 10% of the Faculty)
2014	Winner 3 rd Global Academic Competition for Life Science Leaders of Tomorrow (Awarded submission: Pediatric drugs – Regulatory Challenges and Available Dosage Forms - the sole winning submission from Europe) Catalent Applied Drug Delivery Institute & the American Association of Pharmaceutical Scientists (USA)

Qualifications & Courses

Certified Specialist for Pharmaceutical Technology (Advanced 3-year Training by the Chamber of Pharmacists, Germany)
Fundamentals of Project Management
Good Scientific Practice
Leadership – Potential and Qualification
University Pedagogy

List of publications

Peer-reviewed scientific articles

Original publications

1. Palo M, Kogermann K, Laidmäe I, Meos A, **Preis M**, Heinämäki J, Sandler, N. *Development of Oromucosal Dosage Forms by Combining Electrospinning and Inkjet Printing*. Molecular Pharmaceutics. 2017. In press
2. Wickström, H., Nyman, J.O., Indola, M., Sundelin, H., Kronberg, L., **Preis, M.**, Rantanen, J., Sandler, N. *Colorimetry as Quality Control Tool for Individual Inkjet-Printed Pediatric Formulations*. AAPS PharmSciTech, 2016, doi: 10.1208/s12249-016-0620-1
3. Vakili, H., Nyman, J.O., Genina, N., **Preis, M.**, Sandler, N., *Application of a colorimetric technique in quality control for printed pediatric orodispersible drug delivery systems containing propranolol hydrochloride*. International Journal of Pharmaceutics, 2016, 551, 606-618
4. **Preis, M.**, Grother, L., Axe, P., Breitzkreutz, J., *In vitro and in vivo evaluation of taste-masked Cetirizine hydrochloride formulated in oral lyophilisates*. International Journal of Pharmaceutics, 2015, 491, 8-16
5. **Preis, M.**, Gronkowsky, D., Grytzan, D., Breitzkreutz, J., *Comparative study on novel test systems to determine disintegration time of orodispersible films*. Journal of Pharmacy and Pharmacology 2014, 66, 1102-1111
6. **Preis, M.**, Häusler, O., Breitzkreutz, J., *Application of electronic tongues in preformulation studies to evaluate taste-masking capacities of maltodextrins*. Die Pharmazeutische Industrie: pharmind 2014, 76, 957-962
7. **Preis, M.**, Woertz, C., Schneider, K., Kukawka, J., Broscheit, J., Roewer, N., Breitzkreutz, J., *Design and evaluation of bilayered oromucosal film preparations for local administration of lidocaine hydrochloride*. European Journal of Pharmaceutics and Biopharmaceutics 2014, 86, 552-561
8. Guhmann M., **Preis M.**, Gerber F., Pöllinger N., Breitzkreutz J., Weitschies W., *Design, development and in vitro evaluation of a diclofenac taste masked orally disintegrating tablet formulation*. Drug Development and Industrial Pharmacy 2015, 41, 540-551
9. **Preis, M.**, Knop, K., Breitzkreutz, J., *Mechanical strength test for orodispersible and buccal films*. International Journal of Pharmaceutics 2014, 461, 22-29
10. **Preis, M.**, Eckert, C., Häusler, O., Breitzkreutz, J., *A comparative study on solubilizing and taste-masking capacities of hydroxypropyl- β -cyclodextrin and maltodextrins with high amylose content*. Sensors & Actuators B: Chemical 2014, 193, 442-450
11. Pein, M., Eckert, C., **Preis, M.**, Breitzkreutz, J., *New protocol for α Stree electronic tongue enabling full performance qualification according to ICH Q2*. Journal of Pharmaceutical and Biomedical Analysis 2013, 83, 157-163
12. **Preis, M.**, Pein, M. and Breitzkreutz J., *Development of a taste-masked orodispersible film containing dimenhydrinate*. Pharmaceutics 2012, 4, 551-562
13. Guhmann, M., **Preis, M.**, Gerber, F., Pöllinger, N., Breitzkreutz, J., Weitschies, W., *Development of oral taste masked diclofenac formulations using a taste sensing system*. International Journal of Pharmaceutics 2012, 438, 81-90

Review articles

1. **Preis M**, Breitzkreutz J. *Pediatric Drug Development and Dosage Form Design*. AAPS PharmSciTech. 2017;18(2):239-40.
2. **Preis M** and Öblom H. *3D-Printed Drugs for Children? Are We Ready Yet?* AAPS PharmSciTech 2017;18(2):303-8.
3. Sandler N, **Preis M**. *Printed Drug-Delivery Systems for Improved Patient Treatment*. Trends in Pharmaceutical Sciences. 2016; in press.
4. Krampe, R., Visser, J.C., Frijlink, H.W., Breitzkreutz, J., Woerdenbarg, H.J., **Preis, M.** *Oromucosal film preparations: points to consider for patient-centricity and manufacturing processes*. Expert Opinion on Drug Delivery. 2015, in press, DOI: 10.1517/17425247.2016.1118048
5. **Preis, M.**, *Orally disintegration films and mini-tablets – innovative dosage form of choice for pediatric use*. AAPS PharmSciTech, 2015, 16, 234-241
6. **Preis, M.**, Breitzkreutz, J., Sandler, N., *Perspective: Concepts of printing technologies for oral film formulations*. International Journal of Pharmaceutics, 2015, in press 10.1016/j.ijpharm.2015.02.032
7. **Preis, M.**, Woertz, C., Kleinebudde, P., Breitzkreutz, J., *Oromucosal film preparations: classification and characterization methods*. Expert Opinion on drug delivery 2013, 10, 1303-1317
8. Woertz, C., **Preis, M.**, Breitzkreutz, J., Kleinebudde, P., *Assessment of test methods evaluating mucoadhesive polymers and dosage forms: An overview*. European Journal of Pharmaceutics and Biopharmaceutics 2013, 85, 843 – 853

9. Pein, M., **Preis, M.**, Eckert, C., Kiene, F., *Taste-masking assessment of solid oral dosage forms - a critical review*. International Journal of Pharmaceutics 2014, 465, 239-254

Non-refereed scientific articles

Expert Journals:

1. Beilke, J. **Preis, M.** *Zerfallsprüfung von Schmelzfilmen – Die Entwicklung einer neuen industrietauglichen Testapparatur*. TechnoPharm 2014, 4, 334-337. [Disintegration test for orodispersible films – development of a new test apparatus suitable for industry]
2. **Preis, M.** and Sandler, N. *Personalizing dosage forms by means of printing technologies – A perspective for tailored therapies in the hospitals of tomorrow*. Hospital Pharmacy Europe. 2016, *in press*
3. **Preis, M.** *Arzneimittel aus dem Drucker – innovative Darreichungsformen in 2D und 3D*. TechnoPharm 2016, accepted for publication [Medicine out of the printer – innovative dosage forms in 2D and 3D]

Conference proceedings:

Öblom, H., Berg, J., Alanko, I., **Preis, M.**, Sandler, N.. *Thin substrates manufactured by means of 3D-printing for tailor-made drug delivery systems*. International Journal of Pharmaceutics. 2016; 511(2):1134-5.

Oral presentations

1. Öblom H, Kettiger H, Rosenholm J, Sandler N, **Preis M.** *Mechanical characterization of on-demand printed orodispersible films using a 3D bioprinter*. 2nd European Conference on Pharmaceutics; Novel Dosage Forms & Innovative Technologies 2017, Krakow, Poland. (to be presented April, 2017).
2. Öblom H, Berg J, Alanko I, **Preis M.**, Sandler N. *Tailor-made drug delivery systems manufactured by means of 3D-printing*. Farmasian päivät 2015, Helsinki, Finland
3. Öblom, H., Pollmann, I., Desai, D., Özliseli, E., Rosenholm, J., **Preis, M.** *Enabling flexible dosing in orodispersible paediatric formulations by means of solvent casting and thermal inkjet printing*. 8th Conference of the European Paediatric Formulation Initiative, Lisbon 2016
4. Öblom, H., Pollmann, I., Desai, D., Özliseli, E., Rosenholm, J., **Preis, M.** *Enabling flexible dosing in orodispersible formulations by means of solvent casting and thermal inkjet printing*. PSSRC Meeting, Copenhagen 2016
5. Wickström, H., A. Broos, A., Nyman, J.O., Kortesmäki, E., Eklund, P., de Beer, T., **Preis, M.**, Sandler, N. *Quality control of printed doses of levothyroxine and carve, dilol using a handheld colorimeter*. PSSRC Meeting, Copenhagen 2016
6. Speer, I., Hahn, B., **Preis, M.**, Breitreutz, J. *Characterization of ODFs containing drug-loaded matrix particles intending a prolonged theophylline release*. PSSRC Meeting, Copenhagen 2016
7. Speer, I., **Preis, M.**, Breitreutz, J. *Prolonged release properties for orodispersible films combining solvent casting and melt extrusion*. World Meeting on Pharmaceutics and Biopharmaceutics, Glasgow 2016
8. Yildir, E., **Preis, M.**, Trygg, J., Fardim, P., Sandler, N. *Physically and chemically modified CBs for the solubility enhancement of poorly soluble drugs*. BBBB Conference, Helsinki 2015
9. **Preis, M.**, Sandler, N. *Overcoming challenges in the manufacturing of orodispersible and buccal films*. BBBB Conference Helsinki 2015
10. Guhmann, M., **Preis, M.**, Gerber, F., Pöllinger, N., Breitreutz, J., Weitschies, W., *Taste-masked micropellets of ibuprofen using an innovative spouted bed continuous pelletizing technology*, 9th PBP World Meeting, Lisbon 2014
11. **Preis, M.**, Breitreutz, J., *How to determine suitable mechanical strength of orodispersible films?* 5th Conference of the European Paediatric Formulation Initiative, Barcelona 2013
12. **Preis, M.**, Schneider, K., Kukawka, J., Broscheit, J., Roewer, N., Breitreutz J., *Development of bilayer oral films*. 6th PSSRC Meeting, Lisbon 2012
13. Eckert, C., **Preis, M.**, Häusler, O., Breitreutz, J., *Comparative study on the taste masking capacity of hydroxypropyl- β -cyclodextrin and maltodextrin by an electronic tongue*. 8th PBP World Meeting, Istanbul 2012
14. Pein M., Eckert, C., **Preis, M.**, Breitreutz, J., *Taste sensing system α Stree as analytical tool – Performance Qualification using caffeine citrate as model substance*. 8th PBP World Meeting, Istanbul 2012
15. **Preis, M.**, Breitreutz, J., *Enhancement of drug solubility in oral patch formulations by cyclodextrins and maltodextrin*. 5th PSSRC Meeting, Helsinki 2011

Poster presentations

1. Öblom H, Rahman J, Sjöholm E, Sandler N, **Preis M.** (to be presented 2017, May). *Printability of polymer-based formulations using a 3D bioprinter*. To be presented at the 6th FIP Pharmaceutical Sciences World Congress 2017, Stockholm, Sweden.

2. Özliseli E, Przychodzeń, Casals E, Öblom H, **Preis M**, Xu C, Willför S, Sandler N, Sahlgren C, Rosenholm J. (February 2017 and October 2016). *3D printed biofunctional scaffolds integrated with smart drug delivery for tissue engineering*. Presented at 28th Symposium of Finnish Society of Physical Pharmacy 2017 and at the Center for Functional Materials Annual Meeting 2016, Turku, Finland.
3. Yildir E, Sjöholm E, **Preis M**, Trygg J, Fardim P, Sandler N. *Exploring cellulose discs as carriers in oromucosal drug delivery*. NorthernPharmaNetwork, 2017
4. Wickström, I., Broos, A., Nyman, J.O., Kortesmäki, E., Eklund, P., de Beer, T., **Preis, M.**, Sandler, N. *Quality Control of Printed Doses of Levothyroxine and Carvedilol Using a Handheld Colorimeter*. AAPS Annual Meeting, Denver 2016
5. Öblom, H., Pollmann, I., Desai, D., Özliseli, E., Rosenholm, J., **Preis, M.** *Enabling Flexible Dosing in Orodispersible Formulations by means of Solvent Casting and Thermal Inkjet Printing*. AAPS Annual Meeting, Denver 2016
6. Öblom, H., Pollmann, I., Immohr, I., Desai, D., Özliseli, E., Rosenholm, J., **Preis, M.** *Electronic Taste Assessment of Orodispersible Formulations with Prednisolone and Isoniazid for Pediatric Use*. AAPS Annual Meeting, Denver 2016
7. Speer, I., Hahn, B., **Preis, M.**, Breitzkreutz, J. *Characterization of ODFs containing drug-loaded matrix particles intending a prolonged theophylline release*. AAPS Annual Meeting, Denver 2016
8. Palo, M., Kogermann, K., Laidmäe, I., **Preis, M.**, Heinämäki, J., Sandler, N. *Electrospun nanofibrous substrates for inkjet printing of drug delivery systems*. AAPS Annual Meeting, Denver 2016
9. Wickström, I., Broos, A., Nyman, J.O., Kortesmäki, E., Eklund, P., de Beer, T., **Preis, M.**, Sandler, N. *Handheld colorimeter as quality control tool for inkjet printed flexible levothyroxine doses for pediatric use*. 8th Conference of the European Paediatric Formulation Initiative, Lisbon 2016
10. Yildir, E., Sjöholm, E., **Preis, M.**, Trygg, J., Fardim, P., Sandler, N. *Exploring cellulose discs as carriers in oromucosal drug delivery*. World Meeting on Pharmaceutics and Biopharmaceutics, Glasgow 2016
11. Palo, M., Kogermann, K., Laidmäe, I., **Preis, M.**, Nyman, J.O., Heinämäki, J., Sandler, N. *Electrospun fibrous gelatin substrates for inkjet printing*. World Meeting on Pharmaceutics and Biopharmaceutics, Glasgow 2016
12. Nyman, J.O., **Preis, M.**, Wickström, H., Öblom, H., Desai, D., Nolvi, A., Kassmakov, I., Rosenholm, J., Hægström, E., Sandler, N. *Scanning White Light Interferometry – a powerful tool in pharmaceutical surface characterisation*. World Meeting on Pharmaceutics and Biopharmaceutics, Glasgow 2016
13. Palo, M., Kogermann, K., Laidmäe, I., **Preis, M.**, Nyman, J.O., Heinämäki, J., Sandler, N. *Electrospun nanofibrous substrates for inkjet-printed drug formulations*. The 27th Annual Symposium of the Finnish Society of Physical Pharmacy, Helsinki 2016
14. Vakili, H., **Preis, M.**, Genina, N., Nyman, J.O., Sandler, N. *Application of a colorimetric technique in quality control of tunable orodispersible formulations of propranolol hydrochloride*. The 27th Annual Symposium of the Finnish Society of Physical Pharmacy, Helsinki 2016
15. Yildir, E., Sjöholm, E., **Preis, M.**, Trygg, J., Fardim, P., Sandler, N. *Exploring cellulose discs as carriers in oromucosal drug delivery*. The 27th Annual Symposium of the Finnish Society of Physical Pharmacy, Helsinki 2016
16. Öblom, H., **Preis, M.**, Berg, J., Alanko, I., Sandler, N. *Tailor-made drug delivery systems manufactured by means of 3D printing*. Farmasianpäivät, Helsinki 2015
17. Öblom, H., **Preis, M.**, Löbmann, K., Rades, T., Sandler, N. *Solid-state characterization of co-amorphous formulations incorporated in thin film substrates manufactured by three-dimensional printing*. AAPS Annual Meeting, Orlando 2015
18. Nakano, K., **Preis, M.**, Sandler, N. *Application of three-dimensional printing to the fabrication of sustained release dosage form*. AAPS Annual Meeting, Orlando 2015
19. Yildir, E., **Preis, M.**, Trygg, J., Fardim, P., Sandler, N. *Physically and chemically modified Cellulose Beads for the solubility enhancement of poorly soluble drugs*. AAPS Annual Meeting, Orlando 2015
20. Thabet, Y., Krainitzki, L., Dietzel, D., **Preis, M.** *Impact of different drying conditions on mechanical properties of orodispersible films*. Annual Meeting of the German Pharmaceutical Society, Düsseldorf 2015
21. Öblom, H., Berg, J., Alanko, I., **Preis, M.**, Sandler, N. *Thin substrates manufactured by means of 3D-printing - tailor-made drug delivery system for paediatric use*. 7th Conference of the European Paediatric Formulation Initiative, Antwerp 2015
22. Sieber, D., Krampe, R., Stolze, C., Lenhart, V., **Preis, M.**, Breitzkreutz, J. *Fillet: A new dosage form combining orodispersible films and orodispersible tablets – Preparation concepts*. European Meeting on Biopharmaceutics: Drug Delivery, Reims 2015
23. Krampe, R., Sieber, D., R., Stolze, C., Lenhart, V., **Preis, M.**, Breitzkreutz, J. *Fillet: A new dosage form combining orodispersible films and orodispersible tablets – Influence of different films and tablets*. European Meeting on Biopharmaceutics: Drug Delivery, Reims 2015

24. **Preis, M.**, Breitzkreutz, J., *Development of novel disintegration test systems for orodispersible films*. 9th PBP World Meeting, Lisbon 2014
25. **Preis, M.**, Broscheit, J., Roewer, N., Breitzkreutz, J., *Buccal films containing midazolam hydrochloride as an alternative to tablets in premedication*, 9th PBP World Meeting, Lisbon 2014
26. **Preis, M.**, Schneider, K., Kukawka, J., Broscheit, J., Roewer, N., Breitzkreutz, J., *Development of bilayer oral films containing lidocaine hydrochloride*. AAPS Annual Meeting and Exposition, Chicago 2012
27. Guhmann, M., **Preis, M.**, Gerber, F., Pöllinger, N., Breitzkreutz, J., Weitschies, W., *Development and evaluation of multiparticulate orally disintegrating tablets comprising diclofenac*. Oral Multiparticulate Dosage Forms – What's new? Prague 2012
28. **Preis, M.**, Broscheit, J., Roewer, N., Breitzkreutz, J., *Development of a palatable midazolam formulation for paediatric use*. 4th Conference of the European Paediatric Formulation Initiative, Prague 2012
29. **Preis, M.**, Schneider, K., Kukawka, J., Broscheit, J., Roewer, N., Breitzkreutz, J., *Electronic taste assessment of bilayer orodispersible films*. 4th Conference of the European Paediatric Formulation Initiative, Prague 2012
30. **Preis, M.**, Breitzkreutz, J., *Introduction of a new disintegration test for orodispersible films*. 4th Conference of the European Paediatric Formulation Initiative, Prague 2012
31. **Preis, M.**, Woertz, C., Breitzkreutz, J., *Mucoadhesive polymer films – influence of thickness on disintegration time and mouthfeeling*. 8th PBP World Meeting, Istanbul 2012
32. **Preis, M.**, Breitzkreutz, J., *Comparative etongue investigations on orodispersible dimenhydrinate formulations including combined data treatment*. 8th PBP World Meeting, Istanbul 2012
33. Guhmann, M., **Preis, M.**, Gerber, F., Poellinger, N., Breitzkreutz, J., Weitschies, W., *Taste evaluation of different diclofenac salts in early pharmaceutical development stage using a taste sensing system*. 8th PBP World Meeting, Istanbul 2012
34. Hoffmann, E.M., **Preis, M.**, Akyüz, G., Son, Ö., Breitenbach, A., Breitzkreutz, J., *Comparison of different disintegration tests for oral soluble films*. AAPS Annual Meeting, Washington DC 2011
35. **Preis, M.**, Häusler, O., Breitzkreutz, J., *Electronic taste sensing system to evaluate taste-masking properties of maltodextrins*. APGI Poorly Soluble Drugs Workshop, Lille 2011
36. **Preis, M.**, Breitzkreutz, J., *Development of an orodispersible mini-patch containing dimenhydrinate for the treatment of vomiting and nausea in the paediatric population*. 3rd Conference of the European Paediatric Formulation Initiative, Straßburg 2011
37. **Preis, M.**, Wörtz, K., Breitzkreutz, J., *Taste assessment of orodispersible mini-patches containing dimenhydrinate by an electronic taste sensing system*. 3rd Conference of the European Paediatric Formulation Initiative, Straßburg 2011
38. Hoffmann, E.M., **Preis, M.**, Akyüz, G., Son, Ö., Breitzkreutz, J., *Development of new disintegration tests for orodispersible films*. 3rd Conference of the European Paediatric Formulation Initiative, Straßburg 2011
39. **Preis, M.**, Breitzkreutz, J., *Preparation and characterization of orodispersible films (ODFs) containing the local anesthetic lidocaine hydrochloride*. 6th Polish German Symposium, Düsseldorf 2011

Thesis

PhD Thesis: *Oromucosal film preparations for pharmaceutical use: formulation development and analytical characterization* – Heinrich-Heine-University of Düsseldorf, Germany, June 2014.

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