

Curriculum vitae

PERSONAL INFORMATION

Family name, First name: Prof. Dr. Landfester, Katharina
H index: 119 (Google scholar) / 96 (Web of Science); Researcher ID [F-9449-2011](#),
Rank 21st in Best Female Scientists in Germany 2023 Ranking (Research.com)
Date of birth: June 11, 1969
Nationality: German, 2 children
URL for web site: http://www.mpip-mainz.mpg.de/physical_chem_of_polymers



• EDUCATION

2002 Habilitation in *Physical Chemistry* at the University of Potsdam, Germany
1995 Ph.D., in the group of Prof. Dr. H.W. Spiess at the Max Planck Institute for Polymer Research in Mainz, Johannes Gutenberg University Mainz, Germany.
1993 Diploma, Technical University of Darmstadt, Germany

• CURRENT POSITION(S)

2022 - Cofounder of StartUp Company Lignilabs
2008 - Director, Max Planck Institute for Polymer Research, Physical Chemistry of Polymers, Mainz, Germany
2008 - Professor, Department of Chemistry, Johannes Gutenberg University, Mainz, Germany
2012 - 2014 Managing Director of the Max-Planck-Institute for Polymer Research, Mainz, Germany

• PREVIOUS POSITIONS

2003 - 2008 C4 professor (full professor) at the University of Ulm, Chair of the Department for Organic Chemistry III- Macromolecular Chemistry and Organic Materials
1998 - 2003 Group leader (equivalent to an assistant professor) of the group "Miniemulsions" at the Max Planck Institute of Colloids and Interfaces in the department "Colloid chemistry" (head of the department: Prof. Dr. M. Antonietti)

• FELLOWSHIPS AND AWARDS

2020 DB Robinson Lecturer, University of Alberta, Canada
2020 Howard Fellow Lecturer, UNSW Sydney Australia
2014 Bayer Lecturer, Texas A & M University, College Station, USA
2012 Bruno-Werdelmann-Lecturer, University Duisburg-Essen, Germany
2001 Reimund-Stadler award by the German Chemical Society (GDCh), Department Macromolecular Chemistry
2001 Scholarship of the Dr. Hermann Schnell foundation
1998-2000 Scholarship (Liebig) of the Chemical Industry Fund (FCI) at the Max Planck Institute of Colloids and Interfaces, Potsdam, Germany
1996/97 Scholarship from German Research Foundation (DFG) for a research stay at Lehigh University, PA, US in the group of Prof. M. El-Aasser
1995 Award of the *Chemical Industry Fund* (FCI)
1994/95 German academic exchange service (DAAD) scholarships for research stays at the Ecole d'Application des Hauts Polymères in Strassbourg, France (Prof. Dr. M.Lambla)
1992/93 German academic exchange service (DAAD) scholarship

• SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

1998 - 2003 5 postdocs, 6 PhD students
Max Planck Institute of Colloids and Interfaces/University of Potsdam, Germany
2003 - 2008 6 postdocs, 27 PhD students, 42 diploma students
University of Ulm, Germany
2008 - 43 postdocs, 108 PhD students, 69 diploma/master students
Max Planck Institute for Polymer Research/University of Mainz, Germany

• TEACHING ACTIVITIES

2003 - 2008 Assistant - Macromolecular Chemistry, University of Potsdam, Germany
2003 - 2008 Professor - Macromolecular Chemistry, University of Ulm, Germany
2008 - Professor - Macromolecular Chemistry, Johannes Gutenberg University Mainz, Germany

• ORGANISATION OF SCIENTIFIC MEETINGS

2016 Organizing committee, "3D printing", Mainz Germany, 250 participants

- 2016 Main organizer, “Chemical Design – Biomedical Applications”, Mainz, Germany, 150 participants
2014 Organization Committee EuCheMS, Istanbul (ECC5), Turkey, 1200 participants

• **INSTITUTIONAL RESPONSIBILITIES**

- 2019 - Fellow of the Max Planck School Matter to Life
2013 - Co-speaker of the Collaborative Research Center “Nanodimensional polymeric therapeutics for the tumor therapy”, MPIP in collaboration with the University of Mainz, Germany
2012 - Member of the working group “Women Scientists”, Max-Planck Society
2009 - Member of the Steering Committee Max Planck Graduate Center (MPGC), Mainz, Germany
2009 - 2016 Member of the Steering Committee Gutenberg Research College (GfK), University of Mainz, Germany
2009 - 2018 Member of the Steering Committee Graduate School Materials in Science (MAINZ), Mainz, Germany
2008 - 2016 Member of the Perspective Commission of the Max Planck Society, Munich, Germany
2004 - 2006 Dean of Studies for Chemistry at the University of Ulm

• **COMMISSIONS OF TRUST**

- 2022 - Member of the Board of Trustees of the Bingen Technical University of Applied Sciences
2016 - Advisory Board of the *Institut für Verbundwerkstoffe GmbH*, Kaiserslautern, Germany
2016 - 2023 Executive Board, *German Chemical Society* (GDCh), Germany
2016 - 2023 GDCh Selection Committee of the Hermann-Staudinger Award, Germany
2015 - 2023 Scientific Advisory Board of the *Leibniz Institute for Polymer Research Dresden e.V.* (IPF), Dresden, Germany
2015 - 2022 Selection Committee of the GDCh Otto-Hahn Award, Germany
2014 - Board of Trustees of VCI Germany (*German Federation of the Chemical Industry*), Germany
2013 - Speaker of the *Schiemann College*, München
2011 - Board of Trustees *Freiburg Materials Research Centre* (FMF), Freiburg, Germany
2011 - Consulting Committee *Georg-Manecke-Foundation*, Germany
2010 - 2018 Central Selection Committee of the *Alexander von Humboldt Foundation*, Bonn, Germany
2010 - Committee *Polymers*, an Initiative of DECHEMA and VDI-GVC, Germany
2009 - Council of Technology Rhineland-Palatinate, Germany
2009 - 2013 Board of Trustees *Plastics Research Association*, Darmstadt, Germany
2008 - 2016 GDCh Selection Committee for “*Liebig Denkmünze*”, Germany
2008 - 2013 Consulting Committee FRIAS (*Freiburg Institute for Advanced Studies*), Freiburg, Germany
2007 - 2015 GDCh Executive Board, Section Macromolecular Chemistry, Germany
2003 - 2004 Speaker of the *Young Academy of the Berlin-Brandenburg Akademie der Wissenschaften und Leopoldina*

• **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

- 2011 - Elected member of the *National Academy of Science and Engineering* (ACATECH)
2008 - Member, *American Chemical Society* (ACS)
2002 - 2007 Elected member of the *Young Academy* of the *Berlin Brandenburg Academy of Science* and the *National Academy of Sciences Leopoldina*
1989 - Member, *German Chemical Society* (GdCh)

• **EDITORIAL BOARDS**

- Editorial Board Chair Nanoscale Horizons
Editorial Board Colloid Polymer Science; J. of Polymer Science A: Polymer Chemistry
Intern. Advisory Board Macromolecular Chemistry and Physics
Editorial Advisory Board RSC-Polymer Chemistry; Polymer
Advisory Board Materials Horizons, Nanoscale Horizons
Council Member Angewandte Chemie

• **MAJOR COLLABORATIONS**

Worldwide, I have many collaborations leading to high ranked publications. Of major importance is the collaboration with the **University Medical Center Mainz (Volker Mailänder, Dermatology; Stefan Gehring, Children Hospital)**, BioNTech (**Ugur Sahin**), and the collaborations with **Thomas Simmet (University of Ulm, clinical pharmacology at the Institute of Naturopathy and Clinical Pharmacology)**,

Detlev Lohse (University of Twente, Netherlands, Max Planck Center), and Yitzhak Mastai, (Bar-Ilan University, Israel).

Section c: Ten years track-record

In the **past 10 years** I have published **607 original research papers**. Among these, **120 papers have appeared in highly ranked journals** (IF > 10): 3 *Nature Nanotechn.*; 34 *Angew. Chem.*; 16 *ACS Nano*; 6 *JACS*; 7 *NanoLetters*, 3 *Nature Commun.*; 9 *Adv. Funct. Mater.*; 12 *Small*; 9 *Nanoscale Horizons*; 7 *Adv. Sci.*; 9 *Chem. Mater.*; 5 *Adv. Mater.*; 6 *Chem. Soc. Rev.*; 3 *ACS Catalysis*, 1 *Chem. Rev.*). According to Google Scholar Web of Science, my H-Index is **96** with **24899** citations (without self-citations); and **115** with **55672** citations in Google Scholar. 11 papers are listed as “highly cited papers”. In summary, 92 papers have more than 100 citations, 432 papers have more than 20 citations.

1. Peer Reviewed Papers

I have made key scientific developments to not only for the novel formation of multi-functional nano-carriers with a precisely defined chemical shell, but also in identifying and exploring novel applications of these nanocarriers in biology. The underlying technology of the miniemulsion process is closely connected with my name. I was the first to recognize the importance of this process for making polymer-encapsulated functional materials and consequently their pharmaceutical applications, facilitating cell-specific diagnostics, minimally invasive all-optical sensing, and the development of therapeutics. We are developing characterization methods for high-resolution electron microscopy combined with fluorescence microscopy and machine learning.

J.P. Goncalves, D. Promlok, T. Ivanov, S. Tao, T. Rheinberger, S.M. Jo, Y. Yu, R. Graf, M. Wagner, D. Crespy, F.R. Wurm, L.C. da Silva, S. Jiang, **K. Landfester**, “Confining the Sol-Gel Reaction at the Water/Oil Interface: Creating Compartmentalized Enzymatic Nano-Organelles for Artificial Cells”, *Angew. Chem. Int. Ed.* **2023**, 62, e202216966

S. Jiang, L. Caire da Silva, T. Ivanov, M. Mottola, **K. Landfester**, “Synthetic Silica Nano-Organelles for Regulation of Cascade Reactions in Multi-Compartmentalized Systems“, *Angew. Chem. Int. Ed.* **2022**, 61, e202113784 (cited times: 13)

M. Li, S. Jiang, J. Simon, D. Passlick, M.L. Frey, M. Wagner, V. Mailänder, D. Crespy, K. Landfester, “Brush Conformation of Polyethylene Glycol Determines the Stealth Effect of Nanocarriers in the Low Protein Adsorption Regime”, *Nano Letters* **2021**, 21, 1591-1598 (cited 56 times)

M. Peszka, S. Han, C. Volkmann, R. Graf, I. Lieberwirth, **K. Landfester**, D.Y.W. Ng, T. Weil „Controlled Supramolecular Assembly Inside Living Cells by Sequential Multistaged Chemical Reactions” *J. Am. Chem. Soc.* **2020**, 142, 15780-15789 (cited: 42 times)

S. Jiang, M. Xiao, W. Sun, D. Crespy, V. Mailänder, X.J. Peng, J.L. Fan, **K. Landfester**, “Synergistic Anticancer Therapy by Ovalbumin Encapsulation-Enabled Tandem Reactive Oxygen Species Generation”, *Angew. Chem. Int. Ed.* **2020**, 59, 20008–20016 (cited: 64 times)

E. Rideau, R. Dimova, P. Schwille, F.R. Wurm, **K. Landfester**, “Liposomes and polymersomes: a comparative review towards cell mimicking”, *Chem. Soc. Rev.* **2018**, 47, 8572-8610 (cited: 578 times)

M. Tonigold, J. Simon, D. Estupinan, M. Kokkinopoulou, J. Reinholz, U. Kintzel, A. Kaltbeizel, P. Renz, M.P. Domogalla, K. Steinbrink, I. Lieberwirth, D. Crespy, **K. Landfester**, V. Mailänder, “Pre-adsorption of antibodies enables targeting of nanocarriers despite a biomolecular corona”, *Nature Nanotech.* **2018**, 13, 862-869 (cited: 178 times)

M. Kokkinopoulou, J. Simon, **K. Landfester**, V. Mailänder, I. Lieberwirth, „Visualization of the protein corona: towards a biomolecular understanding of nanoparticle cell- interactions”, *Nanoscale* **2017**, 9, 8858-8870 (cited: 171 times)

S. Schöttler, G. Becker, S. Winzen, T. Steinbach, K. Mohr, **K. Landfester**, V. Mailänder, F.R. Wurm, “Protein adsorption is required for stealth effect of poly(ethylene glycol)- and poly(phosphoester)-coated nanocarriers”, *Nature Nanotechnol.* **2016**, 11, 372-377 (cited: 840 times)

S. Tenzer, D. Docter, J. Kuharev, A. Musyanovych, V. Fetz, R. Hecht, F. Schlenk, D. Fischer, K. Kiouptsi, C. Reinhardt, **K. Landfester**, H.J. Schild, M. Maskos, S. Knauer, R. Stauber „Rapid formation of plasma protein corona critically affects nanoparticle pathophysiology“, *Nature Nanotechnology* **2013**, 8, 772-781 (cited: 1593 times).

2. Research monographs and any translations thereof

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3. Granted patents

I hold **over 50 patents** (40 from the last 10 years), the most important ones are listed below:

1. Nanocapsules and process for their production, Date of filing: 23.03.2007, EP 1 972 651 B1
2. Paint dispersions containing pigments, and W/O emulsions as precursors for providing the paint dispersions, Date of filing: 12.03.2012, WO 2012/126750 A2
3. Enzyme-containing mini-emulsions, Date of filing: 14.03.2013, US 8,883,465 B2
4. Capsule, namely nanocapsule, microcapsule or macrocapsule, having a very low oxygen permeability, Date of filing: 04.29.2015, EP 2865443 A1
5. Long-term stable photoactive composition, such as phosphorescent composition or TTA-photon upconversion composition comprising a singlet oxygen inhibitor compound with terminal unsaturated carbon-carbon bonds as solvent, Date of filing: 04.02.2015, WO 2015044129 A1
6. Adsorption von Antikörper an die Oberfläche von Nanopartikeln; Date of filing: 08.05.2018; Europäische Patentanmeldung Nr. 18 171 351.2
7. Lignin Biomaterial as Agricultural Drug Carrier, Date of filing: 06.02.2017, WO002017134308A1

4. Invited presentations to peer reviewed, internationally established conferences

Within the last 10 years, I have been invited to **more than 120 internationally established conferences** and symposia to deliver invited talks of which were 14 plenary talks and 20 keynote lectures. A selection is listed below:

- 2012 Plenary lecture, 5th Symposium on Polymer Chemistry, Chanchun, China
- 2012 Plenary lecture, IUPAC-MACRO 2012, Blacksburg, USA
- 2013 Plenary lecture, UNESCO/IUPAC Conference on Macromolecules and Materials, Stellenbosch, South Africa
- 2013 Plenary lecture, European Polymer Federation (EPF) 2013, Pisa, Italy
- 2013 Plenary lecture, Advanced Polymers via Macromolecular Engineering, Durham, Great Britain
- 2015 Plenary lecture, RACI National Congress 2014, Adelaide, Australia
- 2015 Plenary lecture, International Colloid Conference, Amsterdam, Germany
- 2017 Plenary lecture, Emerging Polymer Technologies Summit, Melbourne, Australia
- 2017 Plenary lecture, IUPAC World Chemistry Congress, Sao Paulo, Brasil
- 2019 Plenary lecture, Paccon 2019, Bangkok, Thailand
- 2019 Plenary lecture, Polymers in Medicine, Prague, Czech Republic
- 2022 Plenary lecture, IUPAC-MACRO 2022, Winnipeg, Canada

5. Organisation of international conferences

- 2016 Organizing committee, “2nd International Conference on 3D Printing in Medicine”, Mainz Germany
- 2016 Main organizer, “Chemical Design – Biomedical Applications”, Mainz, Germany
- 2014 Organization Committee EuCheMS, Istanbul (ECC5), Turkey

6. Prizes/Awards/Academy memberships

- 2020 DB Robinson Lecturer, University of Alberta, Canada
- 2020 Howard Fellow Lecturer, UNSW Sydney Australia
- 2014 Bayer Lecturer, Texas A & M University, College Station, USA
- 2012 Bruno-Werdemann-Lecturer, University Duisburg-Essen, Germany
- 2011- Elected member of the *National Academy of Science and Engineering* (ACATECH)
- 2008 - Member, American Chemical Society (ACS)

7. Major contributions to the early careers of excellent researchers

Over the last 10 years, Max Planck Institute for Polymer Research over 30 postdocs, 80 PhD students and 50 diploma/master students. The average PhD thesis in my group takes 3.3 years. Many of my former students hold now prestigious positions in industry and academia. From the former PhD students, about 30% stay in academia, 70% in industry; 80% of the postdocs stay in academia. My group consists of 10 project leaders (equivalent to assistant and associate professors) leading their subgroups. 20 of my former group members now hold **professor positions** throughout the world. For my group, I have established a **feedback and evaluation system** for all PhD students and postdocs, I organize **junior scientist trainings** for presentation techniques, paper writing, project and time management. I am actively involved as steering committee member in various **graduate schools** (Max Planck Graduate Center (MPGC), Max Planck School Matter to Life, and Graduate School of the Collaborative Research Center SFB1066).

The mentoring and coaching of excellent female researchers is of special interest, therefore I am the founding spokeswoman of the **Elisabeth Schiemann College** of the Max Planck Society (www.mpg.de/8009591/Elisabeth-Schiemann-Kolleg), which supports outstanding young female scientists after their postdoctoral stage on their way to a professorship.