

Curriculum Vitae

Dr. Fabian Pfrenkle

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Education and Professional Experiences

Since 06/2017	Habilitation Freie Universität Berlin
Since 02/2015	Emmy Noether-research group leader Max-Planck-Institut für Kolloid- und Grenzflächenforschung, Potsdam
09/2013 – 01/2015	Group leader Max-Planck-Institut für Kolloid- und Grenzflächenforschung, Potsdam
10/2010 – 08/2013	Research associate (Prof. James C Paulson) The Scripps Research Institute, La Jolla, CA, USA
08/2010 – 09/2010	Postdoc (Prof. Hans-Ulrich Reißig) Freie Universität Berlin
07/2010	Doctor rerum naturalium Freie Universität Berlin „ <i>summa cum laude</i> “
09/2006 – 07/2010	PhD-student (Prof. Hans-Ulrich Reißig) Freie Universität Berlin
07/2006	Diploma Freie Universität Berlin „ <i>with distinction</i> “
10/2001 – 07/2006	Chemistry studies Freie Universität Berlin

Fellowships and Awards

2013 – 2015	Liebig-fellowship of the German Chemical Industry Fund (FCI)
2010 – 2012	Postdoc-fellowship of the German Academic Exchange Service (DAAD)
2007 – 2009	Chemiefonds-fellowship of the German Chemical Industry Fund (FCI)
2006	Award for the best Diploma in Chemistry of the year 2006 at the Freie Universität Berlin

Memberships

Since 2015	IMPRS graduate school on Multiscale Biosystems
Since 2006	German Chemical Society

Recent Lectures

2018	Chemiedozententagung in Jena
2017	Sino-German-Symposium on Polysaccharides, Guangzhou, China RIKEN – Max Planck Joint Research Center, Okinawa, Japan Bioorganic Chemistry Symposium, Technische Universität Berlin Gregor-Mendel-Institut für Molekulare Pflanzenbiologie, Vienna <i>Habilitationsvorstellungsvortrag</i> , Freie Universität Berlin 20. Steinheimer Gespräche, Wiesbaden Technical University of Denmark, Lyngby, Denmark
2016	Bioorganic Chemistry Symposium, Leibniz-Institut für Naturstoff-Forschung und Infektionsbiologie, Jena International Carbohydrate Symposium, New Orleans, Louisiana, USA 14 th Cell Wall Meeting in Crete, Greece Universität Potsdam

List of publications

As principle investigator:

D. Senf, C. Ruprecht, A. Matic, **F. Pfrengle***, "Tailor-Made Polysaccharides with Defined Branching Patterns by Enzymatic Polymerization of Arabinoxylan Oligosaccharides", *Angew. Chem. Int. Ed.* **2018**, in press.

C. Ruprecht, P. Dallabernardina, P. J. Smith, B. R. Urbanowicz, **F. Pfrengle***, "Analyzing Xyloglucan Endotransglycosylases by Incorporation of Synthetic Oligosaccharides into Plant Cell Walls", *ChemBioChem* **2018**, *19*, 793-798.

P. Dallabernardina, C. Ruprecht, P. J. Smith, M. G. Hahn, B. R. Urbanowicz, **F. Pfrengle***, "Automated glycan assembly of galactosylated xyloglucan oligosaccharides and their recognition by plant cell wall glycan-directed antibodies", *Org. Biomol. Chem.* **2017**, *15*, 9996-10000.

M. C. F. Andersen, I. Boos, C. Ruprecht, W. G. T. Willats, **F. Pfrengle**, M. H. Clausen, "Synthesis and Application of Branched Type II Arabinogalactans", *J. Org. Chem.* **2017**, *82*, 12066-12084.

C. Ruprecht, M. P. Bartetzko, D. Senf, P. Dallabernadina, I. Boos, M. C. F. Andersen, T. Kotake, J. P. Knox, M. G. Hahn, M. H. Clausen, **F. Pfrengle***, A synthetic glycan microarray enables epitope mapping of plant cell wall glycan-directed antibodies. *Plant Physiol.* **2017**, *175*, 1094-1104. (**key publication**)

F. Pfrengle*, Synthetic Plant Glycans, *Curr. Opin. Chem. Biol.* **2017**, *40*, 145-151.

D. Senf, C. Ruprecht, Goswinus H. M. de Kruijff, S. O. Simonetti, F. Schuhmacher, P. H. Seeberger, **F. Pfrengle***, Active Site-Mapping of Xylan-Deconstructing Enzymes with Arabinoxylan Oligosaccharides Produced by Automated Glycan Assembly. *Chem. Eur. J.* **2017**, *23*, 3197-3205.

M. P. Bartetzko, F. Schuhmacher, P. H. Seeberger, **F. Pfrengle***, Determining Substrate Specificities of β 1,4-Endo-Galactanases Using Plant Arabinogalactan Oligosaccharides Synthesized by Automated Glycan Assembly. *J. Org. Chem.* **2017**, *82*, 1842-1850.

P. Dallabernardina, F. Schuhmacher, P. H. Seeberger, **F. Pfrengle***, Mixed-Linkage Glucan Oligosaccharides Produced by Automated Glycan Assembly Serve as Tools to Determine the Substrate Specificity of Lichenase. *Chem. Eur. J.* **2017**, *23*, 3191-3196.

M. Wilsdorf, D. Schmidt, M. P. Bartetzko, P. Dallabernardina, F. Schuhmacher, P. H. Seeberger, **F. Pfrengle***, A traceless photocleavable linker for the automated glycan assembly of carbohydrates with free reducing ends. *Chem. Commun.* **2016**, *52*, 10187-10189.

P. Dallabernardina, F. Schuhmacher, P. H. Seeberger, **F. Pfrengle***, Automated Glycan Assembly of Xyloglucan Oligosaccharides. *Org. Biomol. Chem.* **2016**, *14*, 309-313.

M. P. Bartetzko, F. Schuhmacher, H. S. Hahm, P. H. Seeberger, **F. Pfrengle***, Automated Glycan Assembly of Oligosaccharides Related to Arabinogalactan Proteins. *Org. Lett.* **2015**, *17*, 4344-4347. (**key publication**)

D. Schmidt, F. Schuhmacher, A. Geissner, P. H. Seeberger, and **F. Pfrengle***, Automated Synthesis of Arabinoxylan-Oligosaccharides Enables Characterization of Antibodies that Recognize Plant Cell Wall Glycans. *Chem. Eur. J.* **2015**, *21*, 5709-5713. (**key publication**)

As postdoc:

M. S. Macauley, **F. Pfrengle**, C. Rademacher, C. M. Nycholat, A. J. Gale, A. von Drygalski, J. C. Paulson, Antigenic liposomes displaying CD22 ligands induce antigen-specific B cell apoptosis. *J. Clin. Invest.* **2013**, 123, 3074-3083. Highlighted in: L. Nitschke *N. Engl. J. Med.* **2013**, 369, 1373-74.

F. Pfrengle, M. S. Macauley, N. Kawasaki, J. C. Paulson, Copresentation of Antigen and Ligands of Siglec-G Induces B Cell Tolerance Independent of CD22. *J. Immunol.* **2013**, 191, 1724-1731. **(key publication)**

As PhD-student:

T. Lechel, **F. Pfrengle**, H.-U. Reissig, R. Zimmer, Three Carbons for Complexity! Recent Developments on Palladium-Catalyzed Reactions of Allenes. *ChemCatChem* **2013**, 5, 2100-2130.

M. Roskamp, S. Enders, **F. Pfrengle**, S. Yekta, V. Dekaris, J. Dervedde, H.-U. Reissig, S. Schlecht, Multivalent Interaction and Selectivities in Selectin Binding of Functionalized Gold Colloids Decorated with Carbohydrate Mimetics. *Org. Biomol. Chem.* **2011**, 9, 7448-7456.

F. Pfrengle, H.-U. Reissig, Addition of lithiated enol ethers to nitrones and subsequent Lewis acid induced cyclizations to enantiopure 3,6-dihydro-2*H*-pyrans - an approach to carbohydrate mimetics. *Beilstein J. Org. Chem.* **2010**, 6, No. 75.

F. Pfrengle, H.-U. Reissig, Internally Protected Amino Sugar Equivalents from Enantiopure 1,2-Oxazines: Synthesis of Variably Configured Carbohydrates with C-Branched Amino Sugar Units. *Chem. Eur. J.* **2010**, 16, 11915-11925.

F. Pfrengle, H.-U. Reissig, Amino sugars and their mimetics via 1,2-oxazines. *Chem. Soc. Rev.* **2010**, 39, 549-557.

F. Pfrengle, D. Lentz, H.-U. Reissig, A New Ring Closure Approach to Enantiopure 3,6-Dihydro-2*H*-pyrans – Stereodivergent Access to Carbohydrate Mimetics. *Org. Lett.* **2009**, 11, 5534-5537.

A. Al-Harrasi, **F. Pfrengle**, V. Prisyashnyuk, S. Yekta, P. Koóš, H.-U. Reissig, Enantiopure Aminopyrans by a Lewis Acid Promoted Rearrangement of 1,2-Oxazines: Versatile Building Blocks for Oligosaccharide and Sugar Amino Acid Mimetics. *Chem. Eur. J.* **2009**, 15, 11632-11641.

F. Pfrengle, D. Lentz, H.-U. Reissig, Stereodivergent De Novo Synthesis of Branched Amino Sugars by Lewis Acid Promoted Rearrangement of 1,2-Oxazines. *Angew. Chem. Int. Ed.* **2009**, 48, 3165-3169. **(key publication)**

F. Pfrengle, A. Al-Harrasi, I. Brüdgam, H.-U. Reissig, Unusual Heterocyclic Skeletons via Lewis Acid Promoted Rearrangements of 1,3-Dioxolanyl-Substituted 1,2-Oxazines. *Eur. J. Org. Chem.* **2009**, 282-291.

F. Pfrengle, V. Dekaris, L. Schefzig, R. Zimmer, H.-U. Reissig, Indium Trichloride Mediated Cleavage of Acetonides in the Presence of Acid-Labile Functional Groups – Enhancing the Synthetic Utility of 1,3-Dioxolanyl-Substituted 1,2-Oxazines. *Synlett* **2008**, 2965-2968. Highlighted: *Synfacts* **2009**, 251.

Before PhD-thesis:

F. Pfrengle, A. Al-Harrasi, H.-U. Reissig, Lewis Acid Promoted Rearrangements of 1,3-Dioxolanyl-Substituted 1,2-Oxazines into Novel Products with 1,3,6-Trioxa-7-azacyclopenta[cd]indene Skeletons. *Synlett* **2006**, 3498-3500.

Book chapters:

F. Pfrengle*, Solid-phase glycan synthesis. In “Synthetic glycomes”, Royal Society of Chemistry, *submitted*.

F. Pfrengle*, P. H. Seeberger*, Orthogonally protected building blocks for automated glycan assembly. In “Protecting Groups: Strategies and Applications in Carbohydrate Chemistry”, WILEY-VCH, *in press*.

Patents:

J. C. Paulson, M. S. Macauley, **F. Pfrengle**, Methods and Compositions for Treating Bleeding Disorders. US Patent Application #20160060324.