

## Curriculum Vitae



<b>Name</b>	Markus H. Weingarth
<b>Date of birth</b>	02 June 1982 (in Mainz, Germany)
<b>2002-07</b>	Biochemistry, Greifswald University ( <i>1.0 'with distinction'</i> )
<b>2007</b>	PhD student, EPF Lausanne (Switzerland), with Prof. G. Bodenhausen
<b>2007-10</b>	PhD fellow, ENS rue d'Ulm (France) and EPFL (Switzerland), with Prof. G. Bodenhausen
<b>2011-15</b>	Post-doc fellow, University of Utrecht, with Prof. M. Baldus
<b>2015</b>	Group Leader, Assistant Professor, Utrecht University

## Selected Recent Publications

- A.** Medeiros-Silva, J., Jekhmane, S., Lucini Paioni, A., Gawarecka, K., Baldus, M., Swiezewska, E., Breukink, E., Weingarth, M. (2018) *Nature Comm.*, 9, 3963, *High-resolution NMR studies of antibiotics in cellular membranes*
- B.** Visscher, K.M., Medeiros-Silva, J. Mance, D., Rodrigues, J.P.G.L.M., Daniëls, M., Bonvin, A.M.J.J., Baldus, M., Weingarth, M. (2017) *Angew. Chem.*, 56, 13222, *Supramolecular organization and functional implications of K<sup>+</sup> channel clusters in membranes*
- C.** Medeiros-Silva, J., Mance, D., Daniels, M., Jekhmane, S., Houben, K., Baldus, M., Weingarth, M. (2016) *Angew. Chem.*, 55, 13606, *<sup>1</sup>H- detected solid-state NMR studies of water-inaccessible proteins in vitro and in situ*
- D.** Rad Malekshahi, M., Visscher, K.M., Rodrigues, J.P.G.L.M., de Vries, R., Hennink, W.E., Baldus, M., Bonvin, A.M.J.J., Mastrobattista, E., Weingarth, M. (2015) *J. Am. Chem. Soc.*, 137, 7775, *The supramolecular organization of a peptide based nanocarrier at high molecular detail*
- E.** Sinnige, T., Daniels, M., Baldus, M., Weingarth, M. (2014) *J. Am. Chem. Soc.*, 136, 4452. *Proton clouds to measure non-exchangable sidechain protons in solid-state NMR. Cover article*

## Awards

As Principal Investigator & Applicant	Amount	Year of award
NWO ECHO grant	260.000 €	2017
NWO VIDI award, <i>Most prestigious funding for young group leaders in the Netherlands</i>	800.000 €	2015
FEBS Distinguished Young Investigator Award <i>For outstanding performance during the post-doc</i>	5.000 €	2014
NWO VENI award <i>Most prestigious funding for young PIs in the Netherlands</i>	250.000 €	2012
FEBS Long-Term fellowship <i>Highly competitive European post-doc fellowship</i>	100.000 €	2010
PhD fellowship of the French Research Ministry	65.000 €	2007
German Chemical Society (GDCh) Award for the best Pre-diploma	/	2004
<b>Total</b>	<b>1.480.0 €</b>	

## Full publication list

39. Jekhmane, S., Prachar, M., Fontana, F., Medeiros-Silva, J., Pugliese, R., Gelain, F., Weingarth, M., *Design parameters of tissue engineering scaffolds seen at the atomic level*, in preparation
38. Medeiros-Silva, J., Jekhmane, S., Weingarth, M., *Understanding the mode of action of membrane-active antibiotics in native cellular conditions*, invited review, ChemBioChem, special issue 'ChemBioTalents'
37. Jekhmane, S., Medeiros-Silva, J., Li, J., Kümmerer, F., Müller-Hermes, C., Baldus, M., Roux, B., [Weingarth, M.](#), (2018), Nature Comm., accepted, *Shifts in the selectivity filter dynamics cause modal gating in K<sup>+</sup> channels*
36. Medeiros-Silva, J., Jekhmane, S., Lucini Paioni, A., Gawarecka, K., Baldus, M., Swiezewska, E., Breukink, E., [Weingarth, M.](#), (2018) Nature Comm., 9, 3963, *High-resolution NMR studies of antibiotics in cellular membranes*
35. Pinto, C., Mance, D., Sinnige, T., Daniëls, M., [Weingarth, M.](#), Baldus, M. (2018) Nature Comm., 9, 4135, *The beta-barrel assembly machinery exhibits Conformational Flexibility in lipid bilayers as seen by high-sensitivity solid-state NMR*
34. Tikhonova, E., Hariharan, P., Medeiros-Silva, J., Bogdanov, M.V., Dowhan, W., [Weingarth, M.](#),\* Guan, L.,\* (2018) BMC Biology, 16, 85, *Structural and functional characterization of protein-lipid interactions of the Salmonella typhimurium melibiose transporter MelB*
33. Saracino, A., Fontana, F., Jekhmane, S., Medeiros-Silva, J., [Weingarth, M.](#), Gelain, F. (2018) Advanced Science, 5, 1800471, *Elucidating self-assembling peptide aggregation via Morphoscanner: a new tool for protein-peptide structural characterization*
32. Pinto, C., Mance, D., Julien, M., Daniëls, M., [Weingarth, M.](#), Baldus, M. (2018) J. Struct. Bio., accepted, *Studying the assembly of the BAM complex in native membranes by cellular solid-state NMR spectroscopy*
31. Visscher, K.M., Medeiros-Silva, J. Mance, D., Rodrigues, J.P.G.L.M., Daniëls, M., Bonvin, A.M.J.J., Baldus, M., [Weingarth, M.](#), (2017) Angew. Chem., 56, 13222, *Supramolecular organization and functional implications of K<sup>+</sup> channel clusters in membranes, Highlighted as Frontispiece*
30. Medeiros-Silva, J., Jekhmane, S., Baldus, M., [Weingarth, M.](#) (2017) Solid State Nucl. Magn. Reson., 87, 80, *Identifying very strong hydrogen bonds in membrane proteins by time-resolved <sup>1</sup>H-detected solid-state NMR and molecular dynamics simulations, (invited article 'Ultra-fast MAS')*
29. Medeiros-Silva, J., Mance, D., Daniëls, M., Jekhmane, S., Houben, K., Baldus, M., [Weingarth, M.](#) (2016) Angew. Chem., 55, 13606, *<sup>1</sup>H- detected solid-state NMR studies of water-inaccessible proteins in vitro and in situ*
28. Chung, S., Angelici, C., Hinterding, S.O.M., [Weingarth, M.](#), Baldus, M., Houben, K., Weckhuysen, B.M., Bruijninx, P.C.A. (2016) ACS Catal., 6, 4034, *On the role of magnesium silicates in wet-kneaded silica-magnesia catalysts for the Lebedev ethanol-to-butadiene process*
27. Mance, D., Sinnige, T., Kaplan, M., Daniëls, M., Houben, K., Baldus, M., [Weingarth, M.](#) (2015) Angew. Chem., 54, 15799, *A labeling approach to harness backbone and side chain protons in <sup>1</sup>H-detected solid-state NMR. Highlighted in NWO Science News*
26. Jantschke, A., Koers, E., Mance, D., [Weingarth, M.](#), Brunner, E., Baldus, M. (2015) Angew. Chem., 54, 15069, *Insight into the Supramolecular Architecture of Intact Diatom Biosilica Using a DNP-Solid-State NMR-Based Approach*
25. Rad Malekshahi, M., Visscher, K.M., Rodrigues, J.P.G.L.M., de Vries, R., Hennink, W.E., Baldus, M., Bonvin, A.M.J.J., Mastrobattista, E., [Weingarth, M.](#) (2015) J. Am. Chem. Soc., 137, 7775, *The supramolecular organization of a peptide based nanocarrier at high molecular detail*
24. van der Crujisen, E., Koers, E., Sauvée, C., Hulse, R.E., [Weingarth, M.](#), Ouari, O., Perozo, E., Tordo, T., Baldus, M., Chemistry, (2015) Chemistry - A European Journal, 21, 12971, *Biomolecular DNP- supported NMR spectroscopy using site directed spin labeling*
23. van Zandvoort, I., Koers, E.J., [Weingarth, M.](#), Bruijninx, P.C.A. Baldus, M., Weckhuysen, B.M., (2015) Green Chemistry, 17, 4383, *Structural Characterization of <sup>13</sup>C-Enriched Humins and Alkali-treated <sup>13</sup>C Humins by 2D Solid-state NMR*

22. Sinnige, T., Weingarth, M., Daniels, M., Boelens, R., Bonvin, A.M.J.J., Houben, K., Baldus, M., (2015) *Structure*, 23, 1317, *Conformational plasticity of the POTRA 5 domain in the outer membrane protein assembly factor BamA*
21. Koers, E., van der Crujisen, E., Rosay, M., Weingarth, M., Prokofyev, A., Sauvée, C., Ouari, O., Pongs, O., Tordo, P., Maas, W., Baldus, M. (2014) *J. Biomol. NMR*, 60, 157, *NMR-based Structural Biology enhanced by Dynamic Nuclear Polarization at high magnetic field*
20. Sinnige, T., Weingarth, M., Renault, M., Baker, L., Tommassen, J., Baldus, M. (2014) *J. Mol. Bio.*, 426, 2009. *Solid-state NMR studies of full-length BamA in lipid bilayers suggest limited overall POTRA mobility*
19. Sinnige, T., Daniels, M., Baldus, M., Weingarth, M. (2014) *J. Am. Chem. Soc.*, 136, 4452. *Proton clouds to measure non-exchangeable sidechain protons in solid-state NMR*, **Cover article**
18. Weingarth, M.\* van der Crujisen, E., Ostmeier, J., Lievestro, S. Roux, B., Baldus, M.,\* (2014) *J. Am. Chem. Soc.*, 136, 2000, *Quantitative analysis of the water occupancy around the selectivity filter of a K<sup>+</sup> channel in different gating modes* \*corresponding author
17. Koers, E. J., Lopez-Deber, M. P., Weingarth, M., Nand, D., Hickman, D. T., MlakiNdao, D., Pfeifer, A., Muhs, A., Baldus, M. (2013) *Angew. Chem.*, 52, 10905, *Dynamic Nuclear Polarization NMR reveals multiple conformations in lipid-anchored Peptide Vaccines*
16. van der Crujisen, E., Nand, D., Weingarth, M., Prokofyev, A., Hornig, S., Cukkemane, A., Bonvin, A. MMI, Becker, S., Hulse, R. E., Perozo, E., Pongs, O., Baldus, M. (2013) *Proc. Natl. Acad. Sci. USA*, 110, 13008. *The importance of the lipid-pore loop interface for potassium channel structure and function*
15. Weingarth, M., Baldus, M. (2013) *Acc. Chem. Res.*, 46, 2037. *Solid-State NMR-Based Approaches for Supramolecular Structure Elucidation*
14. Weingarth, M., Prokofyev, A., van der Crujisen, E., Nand, D., Bonvin, A., Pongs, O., Baldus, M. (2013), *J. Am. Chem. Soc.*, 135, 10. *Structural determinants of specific lipid binding to potassium channels*
13. Weingarth, M., Ader, C., Melquiond, A., Nand, D., Becker, S., Bonvin, A., Baldus, M. (2012), *Biophys. J.*, 103, 29. *Supramolecular structure of membrane-associated polypeptides by combining solid-state NMR and MD simulations*
12. Cukkemane, A., Nand, D., Gradmann, S., Weingarth, M., Baldus, M. (2012) *Biomol. NMR Assign.* 6, 225, *Solid-state NMR [<sup>13</sup>C,<sup>15</sup>N] resonance assignments of the nucleotide-binding domain of a bacterial cyclic nucleotide-gated channel*
11. Weingarth, M., Trebosc, J., Amoureux, J.P., Bodenhausen, G., Tekely, P. (2011) *Solid State Nucl. Magn. Reson.* 40, 21. *Efficiency at high spinning frequencies of heteronuclear decoupling methods designed to quench rotary resonance*
10. Weingarth, M., Masuda, Y., Takegoshi, Bodenhausen, G., Tekely, P. (2011) *J. Biol. NMR* 50, 129. *Sensitive (<sup>13</sup>C)- (<sup>13</sup>C)C correlation spectra of amyloid fibrils at very high spinning frequencies and magnetic fields*
9. Weingarth, M., Bodenhausen, G. and Tekely, P. (2010) *Chem. Phys. Lett.* 502, 259, *Probing the quenching of rotary resonance by PISSARRO decoupling*
8. Weingarth, M., Bodenhausen, G., Tekely, P. (2010) *Chem. Phys. Lett.* 488, 10, *Editor's choice article. Broadband magnetization transfer using moderate radio-frequency fields for NMR with very high static fields and spinning speeds*
7. Weingarth, M., Tekely, P., Brüschweiler, R., Bodenhausen, G. (2010) *Chem. Comm.* 46, 952. *Improving the quality of 2D solid-state NMR spectra of microcrystalline proteins by covariance analysis*
6. Weingarth, M., Bodenhausen, G., Tekely, P. (2009) *J. Am. Chem. Soc.* 131, 13937. *Broadband carbon-13 correlation spectra of microcrystalline proteins in very high magnetic fields*
5. Weingarth, M., Bodenhausen, G., Tekely, P. (2009) *J. Magn. Reson.* 199, 238. *Low-power decoupling at high spinning frequencies in high static fields*
4. Weingarth, M., Demco, D., Bodenhausen, G., Tekely, P. (2009) *Chem. Phys. Lett.* 469, 342. *Improved magnetization transfer in solid-state NMR with fast magic angle spinning*

3. Rettig, M.\*, Weingarth, M.\*, Langel, W., Kamal, A., Kumar, P., Weisz, K. (2009) *Biochemistry* 48, 12223. \*co-first authors, *Solution structure of a covalently bound pyrrolo-benzodiazepine-benzimidazole hybrid to a 10mer DNA duplex*
2. Weingarth, M., Tekely, P., Bodenhausen, G. (2008) *Chem. Phys. Lett.* 466, 247. *Efficient heteronuclear decoupling by quenching rotary resonance in solid-state NMR*
1. Weingarth, M., Raouafi, N., Duma, L., Bodenhausen, G., Boujlel, K., Schöllhorn, B., Tekely, P. (2008) *Chem. Comm.* 45, 5981. *Revealing molecular self-assembly and geometry of non-covalent halogen bonding by solid-state NMR spectroscopy*

## Talks

36. 10<sup>th</sup> International Peptide Symposium, Kyoto (Japan), 2018  
*'High-Resolution NMR Studies of Peptide-Antibiotics in Cell Membranes'*
35. Ultra-High-Field NMR spectroscopy workshop, Lille (France), 2018, invited talk  
*'Magic bullets to fight antimicrobial resistance'*
34. Biochemisches Kolloquium, Leipzig (Germany), 2018, invited talk  
*'Magic bullets to fight antimicrobial resistance'*
33. FGMR meeting (Fachgruppe Magnetic Resonance), Leipzig (Germany), 2018  
*'Molecular determinants of spontaneous mode shifts of K<sup>+</sup> channels'*
32. Vrije Universiteit Amsterdam (The Netherlands), 2018, invited Seminar  
*'High-resolution NMR studies of antibiotics in cellular membranes'*
31. 8<sup>th</sup> International meeting on antimicrobial peptides (IMAP), Edinburgh (UK), 2018  
*'High-resolution NMR studies of antibiotics in cellular membranes'*
30. Mini-symposium 'The Future of Magnetic Resonance', Frankfurt (Germany), 2018, invited talk  
*'Structures of Magic Bullets: How peptide-antibiotics attack the bacterial cell wall'*
29. 16<sup>th</sup> Workshop on Bioactive Peptides, Naples (Italy) 2018  
*'Towards the native structure of the nisin : Lipid II pore'*
28. 42<sup>nd</sup> FEBS congress, Jerusalem (Israel) 2017  
*'Structures of Magic Bullets: How peptide-antibiotics attack the bacterial cell wall'*
27. 3<sup>rd</sup> FEBS fellows meeting, Jerusalem (Israel) 2017, invited talk  
*'Structures of Magic Bullets: How peptide-antibiotics attack the bacterial cell wall'*
26. NextGenChem symposium, 2017 Utrecht (The Netherlands)  
*'Structures of Magic Bullets: How peptide-antibiotics attack the bacterial cell wall'*
25. Goethe University Frankfurt (Germany) 2016, invited seminar  
*'H-detection in complex Membrane Proteins and Peptides'*
24. CCPN/Biosim joint-conference, Derby (England) 2016, invited talk  
*'Peptide and Protein assembly by solid-state NMR and MD simulations'*
23. 57<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference (ENC), Pittsburgh (USA) 2016  
*'New Approaches for <sup>1</sup>H-detection in complex Membrane Proteins'*
22. Bijvoet Symposium, Soesterberg (Netherlands) 2016, invited talk  
*'Proton-detected solid-state NMR in complex Membrane Proteins'*
21. Polymers and Self- Assembly: From Biology to Nanomaterials (BPS Meeting), Rio de Janeiro (Brazil) 2015  
*'The supramolecular organization of a peptide based nanocarrier at high resolution'*
20. CHAINS 2015 – the Dutch Chemistry conference, Veldhoven (Netherlands) 2015  
*'Supramolecular Organisation of Membrane Proteins'*
19. Membrane Symposium, Chicago (USA) 2015, invited talk  
*'Supramolecular Organisation of Ion Channels as seen by ssNMR and MD simulations'*
18. Conference for W2 professor-position, LMU Munich (Germany) 2015 (selected for short-list)  
*'Supramolecular Organisation of Ion Channels'*

17. 2<sup>nd</sup> FEBS fellows meeting, Paris (France) 2014, invited to talk & chair a session  
*'Toward proteins at atomic resolution in cellular membranes'*
  16. Protons & Membrane Reactions, Gordon Conference, Ventura (USA) 2014  
*'An NMR-Based Study of Water-Protein Contacts During the Gating Cycle of a Membrane-Embedded Potassium Channel'*
  15. 58<sup>th</sup> Meeting of the Biophysical Society, San Francisco (USA) 2014  
*'Ion Channel - Ion Channel Interaction at Atomic Resolution'*
  14. BIOMOS Symposium on Biomolecular Simulation, Ausserberg (Switzerland) 2014  
*'Oligomerisation of peptides & proteins'*
  13. Meeting of the Dutch NMR group, Eindhoven (The Netherlands) 2013, invited talk  
*'Supramolecular Organisation of Ion Channels'*
  12. 53<sup>rd</sup> International Society of Magnetic Resonance (ISMAR), Rio de Janeiro (Brazil) 2013  
*'Determining supramolecular organisation of ion channels by solid-state NMR and computational methods'*
  11. BIOMOS Symposium on Biomolecular Simulation, Ausserberg (Switzerland) 2013  
*'Supramolecular Organisation of Ion Channels'*
  10. 53<sup>rd</sup> Experimental Nuclear Magnetic Resonance Conference (ENC), Miami (USA) 2012  
*'Supramolecular structure of membrane-associated polypeptides by combining solid-state NMR and MD simulations'*
  9. The Netherlands Society on Biomolecular Modelling meeting, Utrecht (Netherlands) 2012  
*'Specific lipid binding to potassium channels as seen by coarse grained MD and solid-state NMR'*
  8. 12<sup>th</sup> Young Scientist Forum of the IUBMB & FEBS Congress, Sevilla (Spain) 2012  
*'Supramolecular organisation of membrane proteins by solid-state NMR and Molecular Dynamics simulations'*
- (2011 – 2008)
7. BIOMOS Symposium on Biomolecular Simulation, Ausserberg (Switzerland) 2011
  6. 51<sup>st</sup> Exp. Nuclear Magnetic Resonance Conference (ENC), Daytona (USA) 2010
  5. Mass. Inst. of Tech. (MIT), seminar, invited by Prof. Griffin, Boston (USA) 2010
  4. National Institute of Health, seminar, invited by Prof. Tycko, Bethesda (USA) 2010
  3. Groupe d'Etude de Résonance Magnétique (GERM), Fréjus (France) 2009
  2. Grand Bassin Parisien, Paris (France) 2009
  1. Grand Bassin Parisien, Rennes (France) 2008

## Teaching Experience

- 2017 – 2019 Director of Bijvoet Summer School 'Exploring Nature's Molecular Machines'
- 2018 Lectures 'Advanced NMR', responsible for solid-state NMR part (MSc level)
- 2018 Lectures Molecules & Cells (MSc level)
- 2015 – 2018 Lectures & Practical: NMR and Molecular Modelling (BSc level)
- 2015 Lectures: Molecular Machines course (BSc/MSc level)
- 2012 Lectures: Dutch NMR summer school (post-graduate level)

## Supervised PhD Students & Postdocs

João Silva (2015 - )

Miranda Jekhmane (2016 - )

## Supervised MSc Students

Christoph Müller-Hermes

Felix Torres

Felix Kümmerer

Barend Elenbaas

Marek Prachar

Benjamin Vermeer

Bram Vermeulen

Thorben Maass

## Recent Reviewer Activities

Journals: Nature // Nature Communications // Journal of the American Scientific Society // Biophysical Journal // Journal of Biomolecular NMR // Biomacromolecules // Scientific Reports // Journal of Physical Chemistry B // PLOS ONE // Protein Engineering, Design, Selection // Journal of Molecular Recognition // Journal of Fluorine Chemistry.....

Reviewer for ETH postdoctoral fellowships

### Book Chapters

1. Weingarth, M., Baldus, M., *Introduction to biological solid-state NMR*, in: *Advances in Biological Solid-State NMR: Proteins and Membrane Active Peptides* (ISBN 978-1-84973-910-8)
2. Mance, D., Weingarth, M., Baldus, M., *Solid-State NMR on Complex Biomolecules: Methods and Applications*, in: *Modern Magnetic Resonance* (DOI: 10.1007/978-3-319-28275-6\_33-1)
3. Narasimhan, S., Mance, D., Pinto, C., Weingarth, M., Bonvin, A.M.J.J., Baldus, M., *Rapid Prediction of Multi-dimensional NMR Data Sets using FANDAS*, in: *Protein NMR: Methods and Protocols* (ISBN 978-1-4939-7385-9)

### Patents

'Efficient heteronuclear decoupling by quenching rotary resonance in solid-state NMR'; US Patent US2010052673; European Patent EP2159589; with Bruker Biospin, Ecole Normale Supérieure, CNRS, EPF Lausanne

### Monographs

1. PhD thesis '*Decoupling and Recoupling in solid-state NMR at very high spinning frequency and static fields*'. Directed by Prof. G. Bodenhausen and Dr. P. Tekely. Grade '*Très honorable*' (best possible grade)
2. Diploma thesis '*Structural investigations of the DNA-pyrrolobenzodiazepine interaction*'. Directed by Prof. K. Weisz and Prof. W. Langel. Grade '*mit Auszeichnung*' (all grades 1.0 / best possible grade).