

Curriculum Vitae – Prof. Dr. Werner Nau

Date of birth: 22.05.1968 in Fulda, Germany
Work place: Department of Life Sciences and Chemistry,
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Scientific Curriculum

11.87 – 08.90 Studies of Chemistry (Diploma) at the University of Würzburg, Germany
09.90 – 12.91 Graduate Studies in Chemistry at St. Francis Xavier University, Canada
03.05.92 M.Sc. in Chemistry, supervisor: Prof. Dieter Klapstein
01.92 – 07.94 Ph.D. studies in Chemistry at the University of Würzburg, Germany
16.08.94 Ph.D. in Chemistry (Dr. rer. nat.), supervisor: Prof. Waldemar Adam
09.94 – 12.95 Postdoctoral stay with Prof. J. C. Scaiano at the University of Ottawa, Canada
01.96 – 03.97 Research Associate at the University of Basel, Switzerland
04.97 – 02.00 Lecture Assistant and Research Director at the University of Basel, Switzerland
03.00 – 06.02 Assistant Professor at the University of Basel
07.02 – 02.04 Adjunct Professor of Chemistry at the University of Basel
since 07.02 (Full) Professor of Chemistry at Jacobs University Bremen
03.12–05.14 Dean for Natural Sciences at Jacobs University Bremen
since 06.14 Appointed Dean for the Focus Area Health and Undergraduate Education

Awards and Prizes

06.90 – 12.91 Fellowship of the Studienstiftung des Deutschen Volkes
20.07.90 Faculty Prize 1989 at the University of Würzburg (for Diploma)
07.92 – 06.94 Kekulé Fellowship of the Fonds der Chemischen Industrie
26.08.94 Study-Achievement-Stipend of the Fonds der Chemischen Industrie
09.94 – 08.95 NATO Fellowship (DAAD)
09.94 – 12.95 Canada International Fellowship (NSERC, Canada)
21.07.95 Faculty Prize 1994 at the University of Würzburg (for Ph.D. Thesis)
06.96 – 10.98 Liebig Fellowship of the Fonds der Chemischen Industrie
07.98 – 09.01 Profil-Fellowship of the Swiss National Science Foundation
26.02.00 Grammaticakis–Neumann Prize of the European Photochemistry Association
03.00 – 02.04 SNF Professorship of the Swiss National Science Foundation
19.03.01 ADUC-Jahrespreis für Habilitanden 2000
17.10.02 Werner Prize 2002 of the Swiss Chemical Society
16.07.2010 EPA-PPS Prize 2010
04.2013 INNOLEC Lectureship at Masaryk University of Brno, Czech Republic
10.15 – 09.18 Guest Professorship, China University of Petroleum, Qingdao, China

Visiting Professorships

07.98 –10.98	W. F. James Chair Professor of Pure and Applied Sciences at St. Francis Xavier University in Antigonish, Nova Scotia, Canada
08.01 –12.01	Margaret L. and Harlan L. Goering Professor in Organic Chemistry at the University of Wisconsin in Madison, USA
12.09	Visiting Professor at the University of Huelva, Spain
01.10 –06.10	Leverhulme Visiting Professor of Chemistry and Physics at the University of Cambridge, UK
07.10 –08.10	Visiting Professor at the Institute of Chemical Research of Catalonia (ICIQ) in Tarragona, Spain

Community Engagement (Selected)

- Member of the Society of German Chemists (GDCh)
- Vice Chairman (re-elected for 2010-2013), Executive Member (elected for 2005-2009, re-elected for 2010-2013), and Member of the Photochemistry Section of the GDCh
- Member of the Liebig-Society for Organic Chemistry
- Vertrauensdozent of the GDCh at Jacobs University (since 2004)
- Past President (2014–2016), President (elected 2012-2014), Vice President (elected 2010-2012), EC Member (elected 2007–2016), National Representative (2001-2004 for Switzerland, 2007-2008 for Germany), and Member of the European Photochemistry Association (EPA)
- Member of the American Chemical Society (ACS) and Organic Chemistry Division
- Fellow (FRSC) and member of the Royal Society of Chemistry (RSC)
- Executive Board Member of the International Foundation of Photochemistry (since 2014)
- International Committee Member of the biannual IUPAC Conference on Photochemistry Series (2010–2014) and of the biannual International Conference Series on Cucurbiturils (since 2009)
- Chair (2013/14), Vice-Chair (2012/13), and Member (2011–2016) of the Ownership Board of the RSC journal “Photochemical and Photobiological Sciences”
- Jury Member for the annually awarded academics (Die Zeit) Prize “Nachwuchswissenschaftler des Jahres”, since 2007

Research Funding

Attracted more than 7 Mio. Euro Third-Party Research Funding during the past 10 years.

Bibliometric Data

Ca. 260 original research publications, more than 80 of which in top multidisciplinary journals with impact factors larger than 10, such as *J. Am. Chem. Soc.*, *Angew. Chem.*, *Nat. Chem.*, *Nat. Meth.* etc., additionally 8 book chapters and 3 patents.

- More than 13500 citations (since 1993), citation average: > 50
- *h*-index 64 and *m*-index 2.7 (age: 50) – Google Scholar data
- Over 200 talks at conferences, in institutes, and at companies

Publications (last 5 years)

- 205) G. Ghale, A. G. Lanctôt, H. T. Kreissl, M. H. Jacob, H. Weingart, M. Winterhalter, W. M. Nau, "Chemosensing Ensembles for Monitoring Biomembrane Transport in Real Time", *Angew. Chem. Int. Ed.* **2014**, *53*, 2762–2765; selected as *Hot Paper*.
- 206) B. Mizaikoff, M. Lämmerhofer, J. Popp, S. He, W. M. Nau, K. Leopold, C. Kranz, J. W. Einax, "Trendbericht Analytische Chemie 2012/2013", *Nachr. Chem.* **2014**, *62*, 407–414.
- 207) F. Biedermann, W. M. Nau, "Noncovalent Chirality Sensing Ensembles for the Detection and Reaction Monitoring of Amino Acids, Peptides, Proteins, and Aromatic Drugs", *Angew. Chem. Int. Ed.* **2014**, *53*, 5694–5699.
- 208) G. Ghale, W. M. Nau, "Dynamically Analyte-Responsive Macrocyclic Host-Fluorophore Systems", *Acc. Chem. Res.* **2014**, *47*, 2150–2159.
- 209) S. T. J. Ryan, J. Del Barrio, I. Ghosh, F. Biedermann, R. J. Coulston, W. M. Nau, O. A. Scherman, "Efficient Host-Guest Energy Transfer in Polycationic Cyclophane-Perylene Diimide Complexes in Water", *J. Am. Chem. Soc.* **2014**, *136*, 9053–9060.
- 210) J. Vázquez, P. Remón, R. N. Dsouza, A. I. Lazar, J. F. Arteaga, W. M. Nau, U. Pischel, "A Simple Assay for Quality Binders to Cucurbiturils" *Chem. Eur. J.* **2014**, *20*, 9897–9901.
- 211) F. Biedermann, W. M. Nau, H.-J. Schneider, "Hydrophobic effects revisited - Implications from studies with supramolecular complexes: High-energy water as non-covalent driving force" *Angew. Chem. Int. Ed.* **2014**, *53*, 11158–11171.
- 212) K. I. Assaf, W. M. Nau, "Cucurbiturils as Fluorophilic Receptors", *Supramol. Chem.* **2014**, *26*, 657–669.
- 213) I. Ghosh, A. Lal Koner, S. Samanta, W. M. Nau, J. N. Moorthy, "Excited-State Properties of Fluorenones: Influence of Substituents, Solvent and Macrocyclic Encapsulation", *Phys. Chem. Chem. Phys.* **2014**, *16*, 16436–16445.
- 214) A. Norouzy, W. M. Nau, "Synthetic Macrocyclic Receptors as Tools in Drug Delivery and Drug Discovery", *Drug Target Review* **2014**: <http://www.drugtargetreview.com/1850/z-homepage-promo/synthetic-macrocyclic-receptors/#.VMZ7kMYeXAM>.
- 215) M. Sayed, F. Biedermann, V. D. Uzunova, K. I. Assaf, A. C. Bhasikuttan, H. Pal, W. M. Nau, J. Mohanty, "Triple Emission of *p*-Dimethylaminobenzonitrile – Cucurbit[8]uril Triggers the Elusive Excimer Emission", *Chem. Eur. J.* **2015**, *21*, 691–696.
- 216) A. Norouzy, Z. Azizi, W. M. Nau, "Indicator Displacement Assays inside Live Cells", *Angew. Chem. Int. Ed.* **2015**, *54*, 792–795.
- 217) K. I. Assaf, W. M. Nau, "Cucurbiturils: From Synthesis to High-Affinity Binding and Catalysis", *Chem. Soc. Rev.* **2015**, *44*, 394–418; featured on front cover page; among the top 15 downloaded articles, see <http://blogs.rsc.org/cs/2015/05/21/top-25-chem-soc-rev-articles-january-march-2015/>.
- 218) A. Norouzy, K. I. Assaf, S. Zhang, M. H. Jacob, W. M. Nau, "Coulomb Repulsion in Short Polypeptides", *J. Phys. Chem.* **2015**, *119*, 33–43.
- 219) A. Farcas, P.-H. Aubert, J. Mohanty, A. I. Lazar, S. Cantin, W. M. Nau, "Molecular wire formation from poly[2,7-(9,9-dioctylfluorene)-alt-(5,5'-bithiophene/cucurbit[7]uril)] polyrotaxane copolymer", *Eur. Polym. J.* **2015**, *62*, 124–129.
- 220) A. Farcas, A.-M. Resmerita, P.-H. Aubert, I. Ghosh, S. Cantin, W. M. Nau, "Synthesis, photophysical and morphological properties of azomethine persilylated α -cyclodextrin main-chain polyrotaxane", *Macromol. Chem. Phys.* **2015**, *216*, 662–670.

- 221) C. Parente Carvalhom, A. Norouzy, V. Ribeiro, W. M. Nau, U. Pischel, "Cucurbiturils as Supramolecular Inhibitors of DNA Restriction by Type II Endonucleases", *Org. Biomol. Chem.* **2015**, *13*, 2866–2869.
- 222) F. Biedermann, D. Hathazi, W. M. Nau, "Associative Chemosensing by Fluorescent Macrocyclic-Dye Complexes – A Versatile Enzyme Assay Platform Beyond Indicator Displacement", *Chem. Commun.* **2015**, 51, 4977–4980; featured on inside cover page.
- 223) V. R. de la Rosa, W. M. Nau, R. Hoogenboom, "Tuning Temperature Responsive Poly(2-alkyl-2-oxazoline)s by Supramolecular Interactions", *Org. Biomol. Chem.* **2015**, *13*, 3048–3057.
- 224) V. R. de la Rosa, W. M. Nau, R. Hoogenboom, "Thermoresponsive Interplay of Water Insoluble Poly(2-alkyl-2-oxazoline)s Composition and Supramolecular Host-guest Interactions", *Int. J. Mol. Sci.* **2015**, *16*, 7428–7444.
- 225) K. I. Assaf, M. S. Ural, F. Pan, T. Georgiev, S. Simova, K. Rissanen, D. Gabel, W. M. Nau, "The Chaotropic Effect Drives Dodecaborate Anions into γ -Cyclodextrin with Micromolar Affinities", *Angew. Chem. Int. Ed.* **2015**, *54*, 6852–6856.
- 226) S. Ryan, R. Young, J. Henkelis, N. Hafezi, N. Vermeulen, A. Hennig, E. Dale, Y. Wu, M. Krzyaniak, A. Fox, W. M. Nau, M. Wasielewski, J. F. Stoddart, O. Scherman, "Energy and Electron Transfer Dynamics within a Series of Perylene Diimide/Cyclophane Systems", *J. Am. Chem. Soc.* **2015**, *137*, 15299–15307.
- 227) N. Saleh, M. B. Al-Handawi, M. S. Bufaroosha, K. I. Assaf, Werner M. Nau, "Tuning Protonation States of Tripeleennamine Antihistamines by Cucurbit[7]uril", *J. Phys. Org. Chem.* **2016**, *29*, 101–106.
- 228) D.-S. Guo, V. D. Uzunova, K. I. Assaf, A. I. Lazar, Y. Liu, W. M. Nau, "Inclusion of Neutral Guests by Water-Soluble Macrocyclic Hosts – A Comparative Thermodynamic Investigation with Cyclodextrins, Calixarenes, and Cucurbiturils", *Supramol. Chem.* **2016**, *28*, in press.
- 229) N. Al Danaf, R. A. Melhem, K. I. Assaf, W. M. Nau, D. Patra, "Photophysical Properties of Neutral and Dissociated Forms of Rosmarinic Acid", *J. Luminesc.* **2016**, *175*, 50–56.
- 230) K. I. Assaf, O. Suckova, N. Al Danaf, V. von Glasenapp, D. Gabel, W. M. Nau, "Dodecaborate-Functionalized Anchor Dyes for Cyclodextrin-Based Indicator Displacement Applications", *Org. Lett.* **2016**, *18*, 932–935.
- 231) A. F. Eftaiha, F. Alsoubani, K. I. Assaf, W. M. Nau, C. Troll, A. K. Qaroush, "Chitin-acetate/DMSO as a Supramolecular Green CO₂-Phile", *RSC Advances* **2016**, *6*, 22090–22093.
- 232) X. Wang, H. He, Y. Wang, J. Wang, X. Sun, H. Xu, W. M. Nau, X. Zhang, F. Huang, "Active Tumor-Targeting Luminescent Gold Clusters with Efficient Urinary Excretion", *Chem. Commun.* **2016**, 52, 9232–9235.
- 233) K. I. Assaf, D. Gabel, W. Zimmermann, W. M. Nau, "High-Affinity Host-Guest Chemistry of Large-Ring Cyclodextrins", *Org. Biomol. Chem.* **2016**, *14*, 7702–7706.
- 234) A. Farcas, K. I. Assaf, A.-M. Resmerita, S. Cantin, M. Balan, P.-H. Aubert, W. M. Nau, "Cucurbit[7]uril-based fluorene polyrotaxanes", *Eur. Polym. J.* **2016**, *83*, 256–264.
- 235) A. I. Lazar, F. Biedermann, K. R. Mustafina, K. I. Assaf, A. Hennig, W. M. Nau, "Nanomolar Binding of Steroids to Cucurbit[*n*]urils: Selectivity and Applications", *J. Am. Chem. Soc.* **2016**, *138*, 13022–13029.

- 236) M. Nilam, P. Gribbon, J. Reinshagen, K. Cordts, E. Schwedhelm, W. M. Nau, A. Hennig, "A Label-Free Continuous Fluorescence-based Assay for Monitoring Ornithine Decarboxylase Activity with a Synthetic Putrescine Receptor", *SLAS Discovery* (formerly *J. Biomol. Screen.*) **2017**, 22, 906–914.
- 237) K. I. Assaf, A. Hennig, S. Peng, D.-S. Guo, D. Gabel, W. M. Nau, "Hierarchical Host-Guest Assemblies Formed on Dodecaborate-Coated Gold Nanoparticles", *Chem. Commun.* **2017**, 53, 4616–4619.
- 238) S. M. Eyrilmez, E. Bernhardt, J. Z. Dávalos, M. Lepšík, P. Hobza, K. I. Assaf, W. M. Nau, J. Holub, J. M. Oliva-Enrich, J. Fanfrlík, D. Hnyk, "Binary twinned-icosahedral [B₂₁H₁₈]⁻ interacts with cyclodextrins as a challenge for its acting towards organic motifs", *Phys. Chem. Chem. Phys.* **2017**, 19, 11748–11752.
- 239) M. Nilam, A. Hennig, W. M. Nau and K. I. Assaf, "Gold Nanoparticle Aggregation Enables Colorimetric Sensing Assay for Enzymatic Decarboxylation", *Analytical Meth.* **2017**, 9, 2784-2787.
- 240) X. Wang, Y. Wang, H. He, X. Ma, Q. Chen, S. Zhang, B. Ge, S. Wang, W. M. Nau, F. Huang, "Deep-Red Fluorescent Gold Nanoclusters for Nucleoli Staining: Real-Time Monitoring of the Nucleolar Dynamics in Reverse Transformation of Malignant Cells", *ACS Appl. Mat. Interf.* **2017**, 9, 17799–17806.
- 241) A.-M. Resmerita, K. I. Assaf, A. I. Lazar, W. M. Nau, A. Farcas, "Polyrotaxanes based on PEG-amine with cucurbit[7]uril, α -cyclodextrin and its tris-O-methylated derivative", *Eur. Polym. J.* **2017**, 93, 323–333.
- 242) G. H. Aryal, K. I. Assaf, K. W. Hunter, W. M. Nau, L. Huang, "Intracavity folding of a perylene dye affords a high-affinity complex with cucurbit[8]uril", *Chem. Commun.* **2017**, 53, 9242–9245.
- 243) A. Mukhopadhyay, T. Hossen, I. Ghosh, A. Koner, W. M. Nau, K. Sahu, J. N. Moorthy, "Helicity-Dependent Regiodifferentiation in the Excited-State Quenching and Chiroptical Properties of Inward/Outward Helical Coumarins", *Chem. Eur. J.* **2017**, 23, 14797–14805.
- 244) A. Stahl, A. I. Lazar, V. N. Muchemu, W. M. Nau, M. S. Ullrich, A. Hennig, "A Fluorescent Supramolecular Chemosensor to Follow Steroid Depletion in Bacterial Cultures", *Analyt. Bioanalyt. Chem.* **2017**, 409, 6485–6494.
- 245) S. Peng, A. Barba-Bon, Y.-C. Pan, W. M. Nau, D.-S. Guo, A. Hennig, "Phosphorylierung reguliert den Membrantransport von Peptiden", *Angew. Chem. Int. Ed.* **2017**, 56, 15742–15745.
- 246) K. I. Assaf, M. Florea, J. Antony, N. M. Henriksen, J. Yin, A. Hansen, Z.-W. Qu, R. Sure, D. Klapstein, M. K. Gilson, S. Grimme, W. M. Nau "The HYDROPHOBE Challenge: A Joint Experimental and Computational Study on the Host-Guest Binding of Hydrocarbons to Cucurbiturils Allowing Explicit Evaluation of Guest Hydration Free Energy Contributions", *J. Phys. Chem. B* **2017**, 121, 11144–11162.
- 247) A. I. Lazar, J. Rohacova, W. M. Nau, "Comparison of Complexation-Induced pK_a Shifts in the Ground and Excited State of Dyes as Well as Different Macrocyclic Hosts and Their Manifestation in Host-Retarded Excited-Dye Deprotonation", *J. Phys. Chem. B* **2017**, 121, 11390–11398.

- 248) K. I. Assaf, M.A. Alnajjar, W.M. Nau, "Supramolecular Assemblies Through Host–Guest Complexation Between Cucurbiturils and an Amphiphilic Guest Molecule", *Chem. Commun.* **2018**, 54, 1734–1737.
- 249) W. Wang, X. Wang, J. Cao, J. Liu, B. Qi, X. Zhou, S. Zhang, D. Gabel, W. M. Nau, K. I. Assaf, H. Zhang, "The Chaotropic Effect as an Orthogonal Assembly Motif for Multi-responsive Boron-containing Supramolecular Networks", *Chem. Commun.* **2018**, 54, 2098–2101.
- 250) G. H. Aryal, R. Vik, K. I. Assaf, K. W. Hunter, L. Huang, J. Jayawickramarajah, W. M. Nau, "Structural Effects on Guest Binding in Cucurbit[8]uril-Perylenemonoimide Host-Guest Complexes", *ChemistrySelect* **2018**, 2, 4699–4704.
- 251) M. H. Jacob, R. N. D'Souza, T. Schwarzlose, X. Wang, F. Huang, E. Haas, Werner M. Nau, "A Method-Unifying View on Loop Formation Kinetics in Peptide and Protein Folding", *J. Phys. Chem. B* **2018**, 122, 4445–4456.
- 252) J. Nekvinda, B. Grüner, D. Gabel, W. M. Nau, K. I. Assaf, "Host-Guest Chemistry of Carboranes: Synthesis of Carboxylate Derivatives and Their Binding to Cyclodextrins", *Chem. Eur. J.* **2018**, 24, 12970–12975.
- 253) M. A. Alnajjar, J. Bartelmeß, R. Hein, P. Ashokkumar, M. Nilam, W. M. Nau, K. Rurack, A. Hennig, Rational Design of Boron-dipyrromethene (BODIPY) Reporter Dyes for Cucurbit[7]uril, *Beilstein J. Org. Chem.* **2018**, 14, 1961–1971.
- 254) H. S. El-Sheshtawy, S. Chatterjee, K. I. Assaf, M. N. Shinde, W. M. Nau, J. Mohanty, "A Supramolecular Approach for Enhanced Antibacterial Activity and Extended Shelf-life of Fluoroquinolone Drugs with Cucurbit[7]uril", *Sci. Rep.* **2018**, 8, 13925.
- 255) M. H. Jacob, I. Ghosh, R. D'Souza, W. M. Nau, "Two Orders of Magnitude Variation of Diffusion-Enhanced Förster Resonance Energy Transfer in Polypeptide Chains", *Polymers* **2018**, 10, 1079; doi:10.3390/polym10101079.
- 256) K. I. Assaf, W. M. Nau, "The Chaotropic Effect as an Assembly Motif in Chemistry", *Angew. Chem. Int. Ed.* **2018**, 57, 13968–13981.
- 257) S. He, F. Biedermann, N. Vankova, L. Zhechkov, T. Heine, R. E. Hoffman, A. De Simone, T. T. Duignan, W. M. Nau, "Cavitation energies can outperform dispersion interactions", *Nature Chemistry* **2018**, 10, 1252–1257.
- 258) S. Zhang, Z. Domínguez, K. I. Assaf, M. Nilam, T. Thiele, U. Pischel, U. Schedler, W. M. Nau, A. Hennig "Precise Supramolecular Control of Surface Coverage Densities on Polymer Micro- and Nanoparticles", *Chem. Sci.* **2018**, 9, 8575–8581.
- 259) W. Wang, X. Wang, C. Xiang, X. Zhou, D. Gabel, W. M. Nau, K. I. Assaf, H. Zhang, "Orthogonal Molecular Recognition of Chaotropic and Hydrophobic Guests Enables Supramolecular Architectures", *ChemNanoMat* **2019**, 5, 124–129.
- 260) S. Zhang, K. I. Assaf, C. Huang, A. Hennig, W. M. Nau, "Ratiometric DNA Sensing with a Host-Guest FRET Pair", *Chem. Commun.* **2019**, 55, 671–674.
- 261) E.-L. Ursu, M. Balan, W. M. Nau, M. Nilam, Y.-C. Liu, A. Farcas, A. Hennig, "Synthesis and Photophysical Properties of Inclusion Complexes Between Conjugated Polyazomethines with γ -Cyclodextrin and its Tris-O Methylated Derivative", *Eur. Polym. J.* **2019**, 113, 236–243.

- 262) A. Farcas, K. I. Assaf, A.-M. Resmerita, L. Sacarescu, M. Asandulesa, P.-H. Aubert, Werner M. Nau, "Cucurbit[7]uril-Threaded Poly(3,4-ethylenedioxythiophene): A Novel Processable Conjugated Polyrotaxane", *Eur. J. Org. Chem.* **2019**, in press.
- 263) K. I. Assaf, W. M. Nau, "Cucurbituril Properties and the Thermodynamic Basis of Host-Guest Binding" in "Cucurbiturils and Related Macrocycles, Ed.: K. Kim, RSC Press, Cambridge, UK, in press.
- 264) A. Hennig, W. M. Nau, "Cucurbituril-Based Sensors and Assays" in "Cucurbiturils and Related Macrocycles, Ed.: K. Kim, RSC Press, Cambridge, UK, in press.