Prof. Dr. Torsten John

Assistant Professor (Tenure-Track) of Physical Chemistry
Head, Biomolecular Systems and Design Lab

School of Science, Constructor University
Campus Ring 1, 28759 Bremen, Germany
tjohn@constructor.university | www.johnlab.de | ORCID: 0000-0001-6059-5964 | Google Scholar

Curriculum Vitae (selected) — full CV available upon request

RESEARCH PROFILE

My research decodes how peptide sequences encode self-assembly pathways at biological and synthetic interfaces, connecting molecular mechanisms to functional biomaterial design. Combining biophysical experiments with molecular dynamics simulations, my lab establishes mechanistic principles governing amyloid(-like) fibril formation, membrane activity, and nano-interface interactions. This integrated approach enables the rational design of next-generation peptide-based materials.

Experimental expertise: Kinetic aggregation assays, QCM-D, fluorescence and CD spectroscopy, model membrane systems and liposomes, atomic force microscopy
Computational expertise: All-atom and coarse-grained molecular dynamics simulations

ACADEMIC POSITIONS

Assistant Professor (Tenure-Track) of Physical Chemistry Sep 2024–present
Head, Biomolecular Systems and Design Lab
School of Science, Constructor University, Bremen, Germany

Research pillars: *Interface-controlled peptide self-assembly · Sequence-guided design of functional peptide fibrils · Membrane activity of self-assembling and antimicrobial peptides*

Postdoctoral Researcher, Max Planck Institute for Polymer Research, Mainz, Germany Jun 2023–Aug 2024
Research focus: Functional fibril design; Peptide co-assemblies; DNA bioconjugates

Postdoctoral Researcher, Massachusetts Institute of Technology, Cambridge, USA Nov 2020–May 2023
Research focus: DNA origami design and simulation; wireframe nanostructures

Postdoctoral Researcher, Leibniz Institute of Surface Engineering, Leipzig Feb 2020–Oct 2020
Research focus: Nanoparticle–peptide interactions

Graduate Research Assistant, Leibniz Institute of Surface Engineering, Leipzig Jul 2015–Feb 2020

EDUCATION

Dr. rer. nat. in Chemistry, Leipzig University, Grade: *summa cum laude (1.0)* Feb 2020
Graduate School, DFG Collaborative Research Centre TRR 102 | Supervisor: Prof. Dr. Bernd Abel
Dissertation: *Interaction and aggregation mechanisms of peptides at biologically relevant interfaces*

M.Sc. in Chemistry, Leipzig University, Grade: *excellent (1.1)* Jun 2015
Thesis: *A molecular dynamics study on alternative mechanisms of amyloid fibril growth*

B.Sc. in Chemistry, Leipzig University, Grade: *very good (1.5)* Jul 2012
Thesis: *Studies on the immobilization of peptide molecules on surfaces using atomic force microscopy*

International Research Visits (during MSc/PhD)
Monash University, Melbourne, Australia (20 months, 2013–2018); University of Queensland, Brisbane, Australia (3 months, 2014–2015); RMIT University, Melbourne, Australia (2 months, 2012)

SELECTED FELLOWSHIPS AND AWARDS

Personal Research Fellowships

Feodor Lynen Return Fellowship, Alexander von Humboldt Foundation 2023–2024
Feodor Lynen Research Fellowship, Alexander von Humboldt Foundation 2021–2022
PhD Fellowship, Friedrich Ebert Foundation (FES) 2016–2019
Endeavour Research Fellowship, Australian Government, Australia 2018

Summer Research Fellowship, The University of Queensland (UQ), Australia 2014–2015
DFG Student Research Fellowship, Graduate School BuildMoNa, Leipzig University 2012–2013

Scientific Awards

Top 10 Young Scientist in Germany, academics.de Nachwuchspreis 2024
Finalist, Leibniz Dissertation Award, Leibniz Association 2021
Junior Researcher Award, Leibniz Institute of Surface Engineering 2020
Finalist, European Young Chemist Award (EYCA), EuChemS 2018
Element (Pb) Award, Periodic Table of Younger Chemists, IUPAC (118 chemists selected globally) 2018
Early Career Researcher Award, Royal Australian Chemical Institute (RACI) 2016

Competitive International Programs

IUPAC/GDCh Young Observers Program 2023
Young Scientist Participant, 70th & 71st Lindau Nobel Laureate Meetings (~600 selected globally) 2020–2022
Young European Talent (YET) Program 2019
CAS SciFinder Future Leaders Program 2017

Scholarships and Early Distinctions

Life Science College Member, Studienstiftung des deutschen Volkes 2013–2015
Scholarship, Friedrich Ebert Foundation (FES) 2012–2015
DAAD Fellowships (ISAP and RISE Worldwide) 2012, 2013

PUBLICATIONS

Publication Metrics (March 2026, Google Scholar)**:** 28 peer-reviewed publications | 790 citations | h-index: 16
15 first-author | 8 corresponding author | 5 journal covers | Published in: *Nature Chemistry*, *Angewandte Chemie*, *Chemical Science*, *Small*, *ACS Chemical Neuroscience*, *Advanced Functional Materials*

* Corresponding author | # Equal contribution

Publications numbered per category (Original Research Articles: 20; Reviews: 4; Policy and Perspectives: 4)

Original Research Articles

(20) A. Lahu, S. Wu, M. Schuler, F. Mazzotta, A. Ramadani, E. Koca, I. Lieberwirth, K. Landfester, **T. John**, D. Y. W. Ng*, T. Weil*, Co-Assemblies Regulate the Catalytic Activity of Peptide Fibrils. *Angew. Chem. Int. Ed.* 65 (**2026**) e11165. https://doi.org/10.1002/anie.202511165.

(19) Y.-L. Tsai, P. Cavallo, Q. Lu, J. Yu, C. P. Ender, J. Link, K. Amann-Winkel, K. Endres, C. V. Synatschke*, **T. John***, Design of the Hydrophobic Core of Self-Assembling Peptide Fibrils for Enhanced Neural Regeneration, *Small Sci.* 5 (**2025**) 2500224. https://doi.org/10.1002/smsc.202500224.

(18) S. Weigold, K. Brödner, **T. John**, J. Freudenberg, U. H. F. Bunz, T. Weil, G. Fytas, K. Müllen*, Self-Assembly of Amphiphilic Polyphenylene Dendrimers with Different Surface Functionalization in Solvent/Non-Solvent Mixtures. *Macromol. Chem. Phys.* 226 (**2025**) 2400431. https://doi.org/10.1002/macp.202400431.

(17) J. Gorman#, S. M. Hart#, **T. John**, M. A. Castellanos, D. Harris, M. F. Parsons, J. L. Banal, A. P. Willard*, G. S. Schlau-Cohen*, M. Bathe*, Sculpting photoproducts with DNA origami, *Chem* 10 (**2024**) 1553–1575. https://doi.org/10.1016/j.chempr.2024.03.007.

(16) S. O. Aderinto, **T. John**, A. Onawole, R. P. Galleh, J. A. Thomas*, Iridium(III)-based minor groove binding complexes as DNA photocleavage agents, *Dalton Trans.* 53 (**2024**) 7282–7291. https://doi.org/10.1039/D4DT00171K. **(Cover Page)**

(15) M. Hayn#, **T. John#**, J. Bandak, L. Rauch-Wirth, B. Abel*, J. Münch*, Hybrid Materials From Peptide Nanofibrils and Magnetic Beads to Concentrate and Isolate Virus Particles, *Adv. Funct. Mater.* 34 (**2024**) 2316260. https://doi.org/10.1002/adfm.202316260.

(14) **T. John***, A. Rampioni, D. Poger, A. E. Mark*, Molecular Insights into the Dynamics of Amyloid Fibril Growth: Elongation and Lateral Assembly of GNNQQNY Protofibrils, *ACS Chem. Neurosci.* 15 (**2024**) 716–723. https://doi.org/10.1021/acschemneuro.3c00754. **(Cover Page)**

(13) **T. John***, S. Piantavigna, T. J. A. Dealey, B. Abel, H. J. Risselada, L. L. Martin*, Lipid oxidation controls peptide self-assembly near membranes through a surface attraction mechanism, *Chem. Sci.* 14 (**2023**)

3730–3741. https://doi.org/10.1039/D3SC00159H. **(Cover Page) (Most popular physical and theoretical chemistry articles 2023)**

(12) **T. John**, L. L. Martin, H. J. Risselada*, B. Abel*, Curvature model for nanoparticle size effects on peptide fibril stability and molecular dynamics simulation data, *Data Brief* 45 (**2022**) 108598. https://doi.org/10.1016/j.dib.2022.108598.

(11) **T. John**, J. Adler, C. Elsner, J. Petzold, M. Krueger, L. L. Martin, D. Huster, H. J. Risselada*, B. Abel*, Mechanistic insights into the size-dependent effects of nanoparticles on inhibiting and accelerating amyloid fibril formation, *J. Colloid Interface Sci.* 622 (**2022**) 804–818. https://doi.org/10.1016/j.jcis.2022.04.134.

(10) X. Wang[#], S. Li[#], H. Jun[#], **T. John**, K. Zhang, H. Fowler, J. P. K. Doye, W. Chiu*, M. Bathe*, Planar 2D Wireframe DNA Origami, *Sci. Adv.* 8 (**2022**) eabn0039. https://doi.org/10.1126/sciadv.abn0039.

(9) H. Jun, X. Wang, M. F. Parsons, W. P. Bricker, **T. John**, S. Li, S. Jackson, W. Chiu, M. Bathe*, Rapid prototyping of arbitrary 2D and 3D wireframe DNA origami, *Nucleic Acids Res*. 49 (**2021**) 10265–10274. https://doi.org/10.1093/nar/gkab762.

(8) **T. John**, J. Bandak, N. Sarveson, C. Hackl, H. J. Risselada, A. Prager, C. Elsner, B. Abel*, Growth, Polymorphism, and Spatially Controlled Surface Immobilization of Biotinylated Variants of $IAPP_{21-27}$ Fibrils, *Biomacromolecules* 21 (**2020**) 783–792. https://doi.org/10.1021/acs.biomac.9b01466.

(7) **T. John**, G. W. Greene, N. A. Patil, T. J. A. Dealey, M. A. Hossain, B. Abel, L. L. Martin*, Adsorption of Amyloidogenic Peptides to Functionalized Surfaces Is Biased by Charge and Hydrophilicity, *Langmuir* 35 (**2019**) 14522–14531. https://doi.org/10.1021/acs.langmuir.9b02063. **(Cover Page)**

(6) **T. John**, T. J. A. Dealey, N. P. Gray, N. A. Patil, M. A. Hossain, B. Abel, J. A. Carver, Y. Hong, L. L. Martin*, The Kinetics of Amyloid Fibrillar Aggregation of Uperin 3.5 is Directed by the Peptide's Secondary Structure, *Biochemistry* 58 (**2019**) 3656–3668. https://doi.org/10.1021/acs.biochem.9b00536.

(5) L. L. Martin*, C. Kubeil, S. Piantavigna, T. Tikkoo, N. P. Gray, **T. John**, A. N. Calabrese, Y. Liu, Y. Hong, M. A. Hossain, N. Patil, B. Abel, R. Hoffmann, J. H. Bowie, J. A. Carver, Amyloid aggregation and membrane activity of the antimicrobial peptide uperin 3.5, *Pept. Sci.* 110 (**2018**) e24052. https://doi.org/10.1002/pep2.24052.

(4) **T. John**, T. Thomas, B. Abel, B. R. Wood, D. K. Chalmers, L. L. Martin*, How kanamycin A interacts with bacterial and mammalian mimetic membranes, *Biochim. Biophys. Acta - Biomembr.* 1859 (**2017**) 2242–2252. https://doi.org/10.1016/j.bbamem.2017.08.016.

(3) **T. John**, Z. X. Voo, C. Kubeil, B. Abel, B. Graham, L. Spiccia, L. L. Martin*, Effects of guanidino modified aminoglycosides on mammalian membranes studied using a quartz crystal microbalance, *Med. Chem. Commun.* 8 (**2017**) 1112–1120. https://doi.org/10.1039/C7MD00054E.

(2) A. Gladytz, **T. John**, T. Gladytz, R. Hassert, M. Pagel, S. Naumov, H. J. Risselada, A. G. Beck-Sickinger, B. Abel*, Peptides@mica: From affinity to adhesion mechanism, *Phys. Chem. Chem. Phys.* 18 (**2016**) 23516–23527. https://doi.org/10.1039/C6CP03325C.

(1) M. Pagel, R. Hassert, **T. John**, K. Braun, M. Wießler, B. Abel, A. G. Beck-Sickinger*, Multifunctional Coating Improves Cell Adhesion on Titanium by using Cooperatively Acting Peptides, *Angew. Chem. Int. Ed.* 55 (**2016**) 4826–4830. https://doi.org/10.1002/anie.201511781.

Reviews

(4) N. Alleva, J. Zhang, D. Y. W. Ng, T. Weil*, **T. John***, Functionalizing Nucleic Acids: Synthesis and Purification Strategies for Bioconjugates as Biomaterials. *Small* 22 (**2026**) e10863. https://doi.org/10.1002/smll.202510863.

(3) **T. John***, L. L. Martin, B. Abel*, Peptide Self-Assembly into Amyloid Fibrils at Hard and Soft Interfaces—From Corona Formation to Membrane Activity, *Macromol. Biosci.* 23 (**2023**) 2200576. https://doi.org/10.1002/mabi.202200576.

(2) **T. John**[#], A. Gladytz[#], C. Kubeil, L. L. Martin, H. J. Risselada, B. Abel*, Impact of nanoparticles on amyloid peptide and protein aggregation: a review with a focus on gold nanoparticles, *Nanoscale* 10 (**2018**) 20894–20913. https://doi.org/10.1039/C8NR04506B. **(Cover Page)**

(1) **T. John***, B. Abel, L. L. Martin, The Quartz Crystal Microbalance with Dissipation Monitoring (QCM-D) Technique Applied to the Study of Membrane-Active Peptides, *Aust. J. Chem.* 71 (**2018**) 543–546. https://doi.org/10.1071/CH18129.

Policy and Perspectives

(4) E. Dobbelaar*, S. S. Goher, J. L. Vidal, N. K. Obhi, B. M. B. Felisilda, Y. S. L. Choo, H. Ismail, H. L. Lee, V. Nascimento, R. Al Bakain, M. Ranasinghe, B. L. Davids, A. Naim, N.-A. Offiong, J. Borges*, **T. John***, Towards a Sustainable Future: Challenges and Opportunities for Early-Career Chemists, *Angew. Chem. Int. Ed.* 63 (**2024**) e202319892. https://doi.org/10.1002/anie.202319892.

(3) **T. John***, K. E. Cordova, C. T. Jackson, A. C. Hernández-Mondragón, B. L. Davids, L. Raheja, J. V. Milić*, J. Borges*, Engaging Early-Career Scientists in Global Policy-Making, *Angew. Chem. Int. Ed.* 62 (**2023**) e202217841. https://doi.org/10.1002/anie.202217841.

(2) **T. John**#, M. Cieślak#, D. Vargová, S. M. Richardson, V. Mougel*, J. V. Milić*, The Role of Early-Career Chemists in European Policy-Making, *Chem. Eur. J.* 27 (**2021**) 6359–6366. https://doi.org/10.1002/chem.202100167.

(1) C. A. Urbina-Blanco*, S. Z. Jilani*, I. R. Speight*, M. J. Bojdys*, T. Friščić*, J. F. Stoddart*, T. L. Nelson, J. Mack, R. A. S. Robinson, E. A. Waddell, J. L. Lutkenhaus, M. Godfrey, M. I. Abboud, S. O. Aderinto, D. Aderohunmu, L. Bibič, J. Borges, V. M. Dong, L. Ferrins, F. M. Fung, **T. John**, F. P. L. Lim, S. L. Masters, D. Mambwe, P. Thordarson, M. Titirici, G. D. Tormet-González, M. M. Unterlass, A. Wadle, V. W.-W. Yam, Y. Yang, A diverse view of science to catalyse change, *Nat. Chem.* 12 (**2020**) 773–776. https://doi.org/10.1038/s41557-020-0529-x.

PRESENTATIONS

Invited Talks

(12) "Peptide Self-Assembly at Interfaces: From Molecular Mechanisms to Materials Design"
Bremen Life Sciences Meeting, Bremen, Germany, 2025

(11) "Peptide Self-Assembly at Interfaces: From Molecular Mechanisms to Materials Design"
Macromolecular Division, Department of Chemistry, Louisiana State University, virtual, 2025

(10) "Design and Theory of Bionanomaterials – from Peptide to DNA Self-Assembly"
School of Science, Constructor University, Bremen, Germany, 2024

(9) "Design by Theory – Understanding Nature at the Nanoscale for Bioinspired Materials"
School of Chemical Sciences, University of Auckland, Auckland, New Zealand, 2023

(8) "Design by Theory – Understanding Nature for Bioinspired Materials"
Research School of Chemistry, Australian National University, Canberra, Australia, 2023

(7) "Design by Theory – Understanding Nature for Bioinspired Materials"
Department of Chemistry, Johannes Gutenberg University, Mainz, Germany, 2022

(6) "Wireframe DNA Origami: The Computational Perspective"
Laboratory Prof. Dr. Wah Chiu, Bioengineering, Stanford University, virtual, 2021

(5) "Impact of nanostructured surfaces on the aggregation of amyloidogenic peptides"
ACS Virtual Postdoc Symposium, virtual, 2020

(4) "The role of nanoparticles as accelerators and inhibitors of amyloid peptide aggregation"
Institute of Medical Physics and Biophysics, Leipzig University, Leipzig, Germany, 2019

(3) "The impact of nanostructured interfaces on amyloid peptide aggregation"
7th Minisymposium of the SFB-TRR 102, Leipzig, Germany, 2019

(2) "Amyloid-like aggregation of the antimicrobial peptide uperin 3.5 and its selectivity towards membranes", 7th EuChemS Chemistry Congress (ECC), Liverpool, UK, 2018 (award session)

(1) "Membrane activity and amyloidogenic character of the antimicrobial peptide uperin 3.5"
RACI Peptide Users Group Symposium, Melbourne, Australia, 2016

Selected Contributed Talks

- "Molecular Mechanisms of Peptide Assembly for Biomaterials"
  SupraLife Final International Conference, Aveiro, Portugal, 2025
- "Impact of biomimetic membranes on peptide self-assembly into amyloid fibrils"
  ACS Spring National Meeting, San Diego, CA, USA, 2025

- "Designing Peptide and DNA Self-Assembly at the Nanoscale"
  49th IUPAC World Chemistry Congress, The Hague, Netherlands, 2023
- "Modelling and Simulation of DNA-Based Nanomaterials"
  MRS Fall Meeting, Boston, MA, USA, 2022
- "Self-Assembly of Peptides into Amyloid Fibrils at Nanostructured Surfaces"
  ACS Fall National Meeting, Chicago, IL, USA, 2022
- "Self-Assembly and Aggregation of Amyloidogenic Peptides at Nanoparticle Surfaces"
  48th IUPAC World Chemistry Congress, virtual, 2021
- "Impact of nanostructured surfaces on the aggregation of amyloidogenic peptides"
  ACS Fall Meeting, virtual, 2020

TEACHING

Module Coordinator and Instructor, Constructor University (since 2024)

- Physical Chemistry (CO-440), B.Sc. Chemistry and Biotechnology
- Physical Chemistry Lab (CO-446-B), B.Sc. Chemistry and Biotechnology
- Molecules to Matter (MAM-CO-02), M.Sc. Advanced Materials
- Experimental Techniques (MQLS-CO-03), M.Sc. Quantitative Life Science

Deputy Study Program Chair, M.Sc. Advanced Materials (since 2025)

Previous Teaching: Advanced Physical Chemistry Lab, Leipzig University (2016); Medicinal Chemistry Tutorial, Monash University (2013)

Pedagogical qualification: Kaufman Teaching Certificate, MIT (2021)

SUPERVISION

Current doctoral student: Aiswarya Rajeev (2025–present)
Current thesis committee memberships: 3 (Constructor University)
Current academic advisees: 6 (Constructor University)
Total mentees across career: 10+ (PhD, MSc, BSc, research staff)

SERVICE

Peer Review
25+ journals including *Nature Communications*, *Journal of the American Chemical Society*, *ACS Nano*, *Nanoscale*, *Trends in Chemistry*, *ChemBioChem*, *Chemistry - A European Journal*, *Materials Today Chemistry*
Grant review: Dutch Research Council (NWO)

Institutional Service
Dean Search Committee (Mar 2026–present) · Graduate Admission Reader (Jan 2025–present)

Current Professional Society Leadership
International Union of Pure and Applied Chemistry (IUPAC)
Task Group Member, Global Participation in the Young Observer Program — Nov 2025–present
German Bunsen Society for Physical Chemistry (DBG)
Liaison Lecturer (Vertrauensdozent) — Oct 2025–present
Friedrich Ebert Foundation (FES)
Liaison Lecturer (Vertrauensdozent) — May 2025–present

Past Leadership
Former Chair, International Younger Chemists Network (IYCN) (2022–2023)
Former Secretary, European Young Chemists' Network (EYCN) (2017–2019)

Full service and leadership history available in complete CV.

SELECTED MEDIA AND OUTREACH

Interview: Building on a Global Professional Network, ChemViews (**2024**)
Press: New Method Developed to Isolate HIV Particles, Simplifying Detection, Lab Manager (**2024**)
Press: New insights into the development of Alzheimer's disease, Bionity (**2023**)

Spotlight: Torsten John, M. Ferns, *ACS Axial* (**2021**)
Feature: 2017 SciFinder Future Leaders, L. Wang, *C&EN* 95 (**2017**) 40–42.

Science communication: invited talks at the European Parliament (EuChemS, 2019) and IUPAC World Chemistry Congress (2019); led IYCN public outreach activities as Chair and Vice-Chair (2021–2023)

MEMBERSHIPS

German Chemical Society (GDCh)
German Bunsen Society for Physical Chemistry (DBG)
American Chemical Society (ACS)

Last updated: March 2026