

**The Faculty of Medicine of Harvard University
Curriculum Vitae**

Date Prepared: 1st of November, 2025
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Place of Birth: Amsterdam, the Netherlands

Education:

09/1996	MA	Chemistry	University of Amsterdam, the Netherlands
02/2001	PhD	Chemistry (PIs: Henk Schenk, University of Amsterdam and Victor Lamzin, EMBL Hamburg)	European Molecular Biology Laboratory (EMBL) Hamburg, Germany/University of Amsterdam, the Netherlands

Postdoctoral Training:

11/2000-06/2006	Postdoctoral fellow	Structural Biology/Neuro and Immunobiology (PI: Jia-huai Wang, Ellis Reinherz & Dietmar Schmucker)	Dana Farber Cancer Institute, Boston, USA
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Faculty Academic Appointments:

09/2009-01/2020	Group Leader	Hamburg Outstation	EMBL
08/2021-present	Visiting Lecturer	Department of Biological Chemistry and Molecular Pharmacology, Blavatnik Institute	Harvard Medical School

Other Professional Positions:

2006-2009	Staff Scientist	Biology	Synchrotron Soleil, Saint Aubin, France
2016-2017	Consultant	Molecular Dimensions Ltd	
2019-2021	Head of Biological Discovery	Institute for Protein Innovation	
2021-2023	Director	Institute for Protein Innovation	

4/2022 – 11/2022	Interim Executive Director	Institute for Protein Innovation
2023-2024	Senior Director	Institute for Protein Innovation
2024 - present	Head of Neuroscience	Institute for Protein Innovation

Major Administrative Leadership Positions:

Local

2008	Course Director, EMBO Practical Course “X-ray crystal structure determination of macromolecules”	Synchrotron Soleil, Saint Aubin, France
2010-2018	Head of Facility, Sample preparation & characterization facility	EMBL Hamburg, Germany
2010	Course co-organizer, EMBO Practical Course “Protein expression, purification and crystallization”,	EMBL Hamburg, Germany
2011, 2013	Course director EMBL Biophysics lecture course	EMBL and DESY campus, Hamburg Course Director
2012-2016	Course Director, EMBO Practical Course “Protein expression, purification and crystallization”	EMBL Hamburg, Germany
2014	Course co-organizer, EMBO Practical Course “Solution scattering from Biological Macromolecules”	EMBL Hamburg, Germany
2014	Course co-organizer, INSTRUCT sponsored course “Advanced Course on Hybrid Structural Biology Approaches”	EMBL Hamburg, Germany
2014	Co-organizer 40th Anniversary celebration of EMBL Hamburg	EMBL Hamburg, Germany
2018	Course co-organizer, EMBO Practical Course “Membrane protein expression, purification and crystallization”	EMBL Hamburg, Germany
2021	Member of Triumvirate Leadership	Institute for Protein Innovation
2022	Interim Executive Director	Institute for Protein Innovation
2023	Organizer, IPI Surfacing 2023 Symposium	Institute for Protein Innovation
2024	Organizer, IPI Lighting Up Symposium	Institute for Protein Innovation
2024-2025	Organizer, CZI sponsored workshops on neurexin antibody panels	Institute for Protein Innovation
2025	Organizer, workshop on adhesion GPCR related antibodies	Institute for Protein Innovation

Regional

2014	Scientific Board member	15th International Conference on the Crystallization of Biological Macromolecules, Hamburg, Germany
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2015	Organizer	Symposium “Native mass spectrometry: building a bridge between structural and systems biology” with the Centre for Structural Systems Biology (CSSB) and Heinrich Pette Institute (HPI).
2018-2019	Organizer	Lecture series on Molecular Neurobiology between EMBL Hamburg and the Center for Molecular Neurobiology of Hamburg (ZMNH).

International

2017	Co-organizer Axon-2017 conference	IST/Klosterneuburg, Austria
2018	Organizer	EMBO Workshop on Molecular Neuroscience, Crete, Greece
2020	Session Chair	Cold Spring Harbor Meeting on Molecular Mechanisms of Neuronal Connectivity
2023	Panel member	Minisymposium on Antibody validation organized by Ycharos at the American Society of Cell Biology meeting in Boston

Committee Service:

Local

2010-2016	Graduate committee	EMBL Hamburg
	2011-2016	Main representative
2010 - 2018	Admission panel EMBL PhD program	EMBL Hamburg, EMBL Grenoble
	2011 - 2016	Chair
2010 - 2016	Admission panel EMBL EIPOD postdoctoral program	EMBL, all departments, member
2013, 2015, 2016	Hiring panel group leader	EMBL Hamburg, member search committee
2010-2017	Staff training Committees	EMBL Hamburg, member
2013-2019	Thesis Advisory committees (9 students)	EMBL Hamburg, Heidelberg & Grenoble
	2010-2019	Chair (5 students)
2010 - 2018	Hiring panel staff scientists	EMBL Hamburg, Heidelberg
	2010, 2015	Chair
2015 - 2018	Science and Society committee	EMBL, all departments, member
2015 - 2018	Proteomics user committee	EMBL, all departments, member
2015 - 2018	Courses and conferences committee	EMBL, all departments, member

2010-2018	EMBL@Petra3 synchrotron management committee	EMBL Hamburg, member
Regional		
2012-2014	Partnership for Innovation, Education and Research (PIER) Executive Board 2012-2014	Partnership of Hamburg University and DESY(German synchrotron) Member
National		
2013	Thesis Defense Committee Madhan Anandhakrishnan	Heidelberg University, Germany
International		
2012	Thesis Defense Committee Andreas Boeggild	Aarhus University, Denmark
2016	Thesis Defense Committee Jan Felix	Ghent University, Belgium
2018	Thesis Defense Committee Diana Freire	Free University Amsterdam, The Netherlands
2025	Thesis Defense Committee Anushka Nair	Bordeaux University, France
2020 - 2025	Scientific Advisory Board GeneCorner	VIB Ghent, Belgium
Professional Societies:		
2017-2025	Society for Neuroscience	Member
Grant Review Activities:		
2013	Research grant review	W.M. Keck Foundation, USA Ad-hoc reviewer
2013, 2015	Research grant review	Flemish Scientific Organization, Belgium Ad-hoc reviewer
2015	Research grant review Sachbeihilfe	DFG (German Science Foundation) Ad-hoc reviewer
2017	Research grant review OPUS funding scheme	National Science Centre, Poland Ad-hoc reviewer
2017	Research grant reviews for study section CE11 Biochemistry, biophysics, molecular and structural biology	National Agency for Research (ANR), France Ad-hoc reviewer
2018	ECHO research grant review	National Science Organization (NWO), the Netherlands Ad-hoc reviewer

2018	VEGA research grant review	Slovak Academy of Sciences, Slovakia Ad-hoc reviewer
2019	H2020-MSCA-IF-2019 Marie Skłodowska-Curie Individual Fellowships	European Commission Ad-hoc reviewer
2020	Joint NSFC-ISF Research Grant	Israel Science Foundation Ad-hoc reviewer
2023	Armenise MidCareer grant in the area of infectious disease	Armenise Foundation, Ad-hoc reviewer
2024	ERC Synergy Grant	Ad-hoc reviewer

Editorial Activities:

- **Ad hoc Reviewer**

Nature, Nature Communications, PNAS, Development, Neuron, Journal of Neuroscience, Journal of Cell Biology, European Molecular Biology Organization (EMBO) Journal, Biochemistry, Journal of Bacteriology, Scientific Reports, Biochimica et Biophysica Acta, Biotechnology & Bioengineering, Protein Expression & Purification, Biophysical Journal, FEBS letters, Biochemical Journal, Amino Acids, Acta Crystallographica D, PLOS One, Journal of Applied Crystallography

- **Other Editorial Roles**

2016	Section editor	Current Opinion in Structural Biology
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Honors and Prizes:

1994	Erasmus fellowship	European Commission	Traineeship at Instituto de Tecnologia Química e Biológica (ITQB) in Oeiras, Portugal
1996-2000	PhD fellowship	EMBL	Predoctoral fellowship

Report of Funded and Unfunded Projects

Past

2010-2011	P-cube “Trans-national access to high-throughput crystallization platforms” European Commission (FP7/2007-2013), I3 Research Infrastructure grant, P-cube (grant agreement N°227764) Site PI and coordinator of final report for participating crystallization facilities (90,000 EUR) Provide access to research groups within the European Research Area to high-throughput crystallization and characterization facilities for macromolecular samples		
2011-2016	Biostruct-X joint research activity “A multi-method biophysical characterisation system for macromolecular samples” European Commission (FP7/2007-2013), Integrated Infrastructure grant, BioStruct-X (grant		

- agreement N°283570)
 Co-investigator with Dmitri Svergun (200,000 EUR)
 Installation of a size exclusion chromatography/light scattering system on the BioSAXS P12 EMBL synchrotron beamline
- 2011-2016 Biostruct-X “Trans-national access for Protein production and HTP crystallization”
 European Commission (FP7/2007-2013), Integrated Infrastructure grant, BioStruct-X (grant agreement N°283570)
 Site PI (130,000 EUR)
 Provide access to research groups within the European Research Area to high-throughput crystallization and characterization facilities for macromolecular samples
- 2013-2016 Biostruct-X joint research activity “Integrated Beamline Environments for Biological Sample Characterisation and Optimisation”
 European Commission (FP7/2007-2013), Infrastructure grant, BioStruct-X (grant agreement N°283570)
 Workpackage leader
 Required the coordination of joint research activities in the development of new techniques for biological sample handling among several European synchrotron sites.
- 2013-2016 “Entwurf, Konstruktion und Adaption eines Dynamischen Lichtstreusystems an die BioSAXS-Beamline P12 an PETRA III zur Optimierung der Charakterisierung biologischer Makromoleküle bei hohem Probandendurchsatz”.
 Bundesministeriums für Bildung und Forschung, Research on Condensed matter on large infrastructures, (grant agreement 100183019)
 Initiator, coPI (574,000 EUR) with Dmitri Svergun and Prof. Christian Betzel (Hamburg University)
 Installation of a dynamic light scattering system and optical port on the BioSAXS P12 EMBL synchrotron beamline
- 2016-2019 iNEXT “From macromolecular sample to X-ray data collection – Enhanced Support”
 European Commission (Horizon2020), Integrated infrastructure grant, iNEXT (grant agreement 653706)
 Site PI (123,200 EUR)
 Provide access to research groups within the European Research Area to high-throughput crystallization and characterization of macromolecular samples
- 2022-2024 NSF/BMBF Collaborative Research in Computational Neuroscience Program grant
 “Combining computational modeling and artificial intelligence to understand receptor function in physiology and disease”, PI (\$409,000)
- 2024 - 2026 Chan-Zuckerberg Initiative for the project “project Large-scale discovery of protein binders for molecular neuroscience to develop protein affinity reagents to facilitate the molecular cartography of the neuronal synapse and create a toolbox for detecting glia cell types.”, PI (\$500,000)

Training Grants and Mentored Trainee Grants

- 2010-2014 Structural studies on pregnancy-specific glycoproteins
 Marie Curie/EMBL EIPOD postdoctoral fellowship
 Mentor of Anna Gieras (co-mentor Edward Lemke, EMBL Heidelberg)
 The major goal is to understand how pregnancy-specific glycoproteins modulate the maternal immune response, identifying their receptors and molecular interactions
- 2013-2014 Structural studies on UNC5 receptors involved in axon guidance
 EMBO short-term postdoctoral fellowship ASTF 444-2012
 Host/Mentor of Lorenzo Finci (visiting from Peking University, PI Jia-huai Wang)

- 2013-2016 Production of different UNC-5 constructs in anticipation for structural analysis via X-ray crystallography in order to elucidate the mechanism of netrin-1 binding.
Structural studies on lipid mediated binding between adaptor proteins involved in endocytosis
Marie Curie/EMBL EIPOD postdoctoral fellowship
Mentor of Maria Garcia-Alai (co-mentor Marko Kaksonen, EMBL Heidelberg)
The major goal is to understand how the adaptor proteins epsin and HIP1R involved in clathrin-mediated endocytosis interact only through the phospholipid PIP2
- 2015-2018 Structural studies on netrin receptors
Marie Curie/EMBL EIPOD postdoctoral fellowship
Mentor of Tuhin Bhowmick (co-mentor Francesca Peri, EMBL Heidelberg)
The major goal is to understand how netrin/UNC5 interactions may affect apoptosis in a zebra-fish model
- 2016-2019 Structural studies on netrin/draxin interactions
Marie Curie/EMBL EIPOD postdoctoral fellowship
Mentor of Xuefan Gao (co-mentor Anne-Claude Gavin, EMBL Heidelberg)
The major goal is to understand how the auxiliary guidance cue draxin modulates netrin's function in axon guidance
- 2016-2019 Competitive assembly dynamics of the DCC receptor with its guidance cues integrates signals for cellular steering
Marie Curie/EMBL EIPOD postdoctoral fellowship and individual Marie Skłodowska - Curie fellowship "GuideDesign"
Mentor of Rob Smock
The major goal is to understand how environmental factors cause netrin to alter binding to the Deleted in colorectal cancer (DCC) receptor, affecting cell migration and cell death
- 2019 Screening of meteorin receptors
Travelling fellowship, Company of Biologists
Fanny Eggeler (visiting from Marie Curie Institute, Paris, PI Felippo del Bene)
Production of meteorin and screening of candidate receptor ectodomains for binding using a D. rerio AVEXIS library

Report of Local Teaching and Training

Teaching of Students in Courses:

2009-2018	EMBL Predoc Course 1 st year PhD students EMBL	Heidelberg/Hamburg 2 1 hour lecture
2011, 2013	EMBL Hamburg Biophysics lecture course (graduate students, postdocs)	EMBL and DESY campus, Hamburg Tutor (10 hours)
2012, 2016	Crystallography Course (graduate students, postdocs)	EMBL and DESY campus, Hamburg Tutor (5 hours)

Research Supervisory and Training Responsibilities:

2024 - present Supervision of three staff scientists and a One hour 1 on 1 meetings every week

2021 - 2024	research technician Supervision of 10 staff scientists and 11 research technicians as (Senior) Director of the Antibody platform	Half hour 1:1 meetings every week, three one hour lab meetings per week
2019 - 2021	Supervision of three staff scientists and four research technicians as a leader of the Protein Group at the IPI.	One hour lab meeting per week, biweekly 1:1 meetings with each staff member.
2010-2020	Supervision of postdoctoral and predoctoral research fellows (average of 5 fellows per year)	EMBL Hamburg One hour lab meeting per week, 1:1 supervision two hours per week per fellow
2010-2018	Supervision of staff scientist and research technicians at the Sample Preparation & Characterization facility	EMBL Hamburg One hour lab meeting per week, 1:1 Daily ongoing supervision

Mentored Trainees and Faculty:

2010-2014	Matthew Dunne Senior Scientist, ETH Zurich, Switzerland (Loessner lab) Career stage: PhD student. Mentoring role: research advisor. Accomplishments: 2 first-authored manuscripts in PLOS Pathogens and Journal of Biological Chemistry on bacteriophage proteins, now independent researcher in same field.
2010-2014	Heidi Kaljunen, PhD/Postdoctoral fellow, University of Eastern, Finland Career stage: PhD student. Mentoring role: research advisor. Accomplishments: first-authored manuscript in Angewandte Chemie
2012-2014	Nina Krueger, PhD/Scientific writer, Hamburg, Germany Career stage: research technician Mentoring role: research advisor Accomplishments: obtained a PhD based on her lab work within 2 years and a first author scholarship in Neuron
2012-	Sandra Kozak, Postdoctoral researcher at Evotec, Hamburg, Germany Career stage: research technician and PhD student. Mentoring role: facility manager and research advisor. Accomplishments: first-authored scholarship from facility work, admitted to EMBL PhD program, one first author publication.
2012-2015	Lorenzo Finci, PhD/ Scientist, National Center for CryoEM Access and Training, New York Structural Biology Center Career stage: research fellow. Mentoring role: co-PI and host. Accomplishments: multiple first-authored scholarship of mentored research in Neuron, Progress in biophysics and molecular biology and Protein Cell.
2013-2018	Maria Garcia-Alai, PhD/Team leader EMBL Hamburg Career stage: research fellow. Mentoring role: research advisor. Accomplishments: based on scholarship of mentored research and facility management, promoted to EMBL team leader to run Sample Preparation and Characterization facility Six publications, two first authorship manuscripts in Nature Communications.
2015-2018	Ioana Maria Nemtanu, Analyst at BioAgilytix

Career stage: trainee/research technician. Mentoring role: supervisor. Accomplishments: based on traineeship established new protocols for sample preparation of macromolecular samples, was admitted to competitive Masters program in Neurobiology at University of Utrecht.

2015-2018 Tuhin Bhowmick, PhD/Co-founder Pandorum Technologies

Career stage: research fellow. Mentoring role: research advisor. Accomplishments: based on scholarship of mentored research, established a branch of his company Pandorum Technologies in UC San Francisco incubator.

2016-2019 Yiqiong Liu, PhD/Postdoctoral fellow, Harvard Medical School, Boston Children's Hospital (Yi Zhang lab)

Career stage: PhD student. Mentoring role: co-PI and host. Accomplishments: first-authored manuscript in Neuron

2020 - 2022 Elizabeth Gavin, MD student at University of Pennsylvania's Perelman School of Medicine

Career stage: research technician. Mentoring role: supervisor. Accomplishments: launching bispecific ROBO antibody program, was admitted to medical school with full tuition scholarship

2021 - current Shaotong Zhu, Principal Scientist at the Institute for Protein Innovation, Boston, USA

Career stage: Starting principal investigator. Mentoring role: supervisor. Accomplishments: supervision of a postdoc and research technician working on membrane proteins for antibody discovery.

2022 - current Nirakar Basnet, Postdoctoral fellow at the Institute for Protein Innovation

Career stage: postdoc working on developing synthetic antibodies for the human mu-opioid receptor

Local Invited Presentations:

No presentations below were sponsored by 3rd parties/outside entities

Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

2010-2017 "Sample Preparation & Characterization", Project Evaluation Committee EMBL Hamburg facilities

2011-2017 "Sample Preparation, Crystallization & Characterization", Bilateral meeting between EMBL Hamburg and Grenoble (France)

2012,2014 Sample preparation and characterization/invited presentation
EMBO Practical Course "Scattering from Biological Macromolecules"

2016,2018 Joint use of SAXS and crystallography /invited presentation
EMBO Practical Course "Scattering from Biological Macromolecules"

2010 "Taking the inside on phage therapy", Institutional "Pink" seminar, EMBL Monterotondo (Italy)

2010 "Cell surface receptor recognition", EMBL Staff Retreat

2010 "Taking the inside on phage therapy", Institutional "Pink" seminar, EMBL Heidelberg

2012 "Closing the gap; the integrated EMBL@PETRA3 facility", Project Evaluation Committee

- EMBL Hamburg facilities
- 2013 “Guidance cues as molecular scaffolds”, Institutional “Pink” seminar, EMBL Heidelberg
- 2014 “The molecular basis of the bifunctionality of netrin-1 in axon guidance”, Senior Scientist Meeting, EMBL
- 2014 “Samples and SAXS services in Hamburg”, EMBL Staff Retreat
- 2015 “Using a hybrid structural biology approach to solve a puzzle in axon guidance”, Institutional “Pink” seminar, EMBL Heidelberg
- 2017 “Draxin and netrin modulate adhesion between neurites”, Institutional “Pink” seminar, EMBL Heidelberg
- 2017 “Structural investigations into mechanisms of neuronal organization”, EMBL Council
- 2019 “Netrin engages its receptors in conditional adhesion”, EMBL Neurobiology retreat, Cagliari, Italy
- 2019 “Axon guidance receptors”, EMBL-Stanford meeting, Hamburg, Germany
- 2020 “Harnessing the IPI pipeline for neurobiology”, Scientific Advisory Board meeting IPI
- 2021 “Antibodies for neuroscience”, Scientific Advisory Board meeting IPI
- 2021 “Update from the antibody platform”, Scientific Advisory Board meeting IPI
- 2022 “Update on antigen and antibody production at the IPI,” Scientific Advisory Board meeting IPI
- 2022 “Learning from success: from antigen production to cell sorting strategies”, Scientific Advisory Board meeting IPI
- 2023 Science Update, Science and Technology Committee IPI
- 2024 Panel member for Therapeutics Graduate Program symposium, Harvard Medical School on Utilizing Computation, Bioinformatics, and AI in Therapeutics Development.

Report of Regional, National and International Invited Teaching and Presentations

- No presentations below were sponsored by 3rd parties/outside entities
- Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

Regional

- 2011 “Taking the inside on phage therapy”/Invited presentation
University of Hamburg
- 2016 “Wiring the brain with guidance cues and receptors”/Invited presentation
Heinrich Pette Institute, Hamburg
- 2018 “Netrin: a guidance cue that acts as an adhesive glue”/ Invited presentation, FOR2419 PhD Symposium
ZMNH Hamburg (Sponsor Deutsche Forschungs Gemeinschaft)
- 2018 “Netrin signaling through single-pass transmembrane receptors “/Invited presentation, PhD retreat MPI students Frankfurt
University of Hamburg

International

- 1998 “Atomic resolution structures of liver alcohol dehydrogenase”/Invited presentation

- CoLuA meeting, Copenhagen, Denmark
- 2000 “The enzymatic activation of NADH”/Invited presentation
Dutch Crystallographic Meeting, Groningen, the Netherlands
- 2001 “The enzymatic activation of NADH”/Invited presentation, European Crystallography Meeting, Krakow, Poland (2001)
- 2001 “The crystal structure of an MHC II molecule in complex with CD4”/Invited presentation
European Crystallography Meeting, Krakow, Poland
- 2003 “Crystal structure of murine sCEACAM1a[1,4]: a coronavirus receptor in the CEA family/Invited presentation”
Carcino Embryonic Antigen Symposium, Munich, Germany
- 2006 “Structural basis of Dscam isoform specificity”/Invited presentation
European Crystallography Meeting, Leuven, Belgium
- 2008 “A variety of electrostatic interactions and adducts can activate NAD(P) cofactors for hydride transfer”/Invited presentation, Carbonyl Meeting, Kranjska Gora, Slovenia
- 2008 “Macromolecular X-ray beamlines at the Soleil Synchrotron”, MaxInf meeting, Vienna, Austria
- 2010 “Taking the inside on phage therapy”/Invited speaker, Institute for Food Research, Norwich, United Kingdom
- 2011 “Endolysin activation”/Speaker,
70th Anniversary Jia-huai Wang, Dana Farber Cancer Institute, Boston
- 2012 EMBO Global Exchange Lecture Course/Teaching lectures/tutor
Hyderabad, India (sponsor EMBO)
- 2012,2014 FEBS Course “BioCrys. Fundamental of Modern Methods for Biocrystallography”/Teaching lectures/tutor
Oeiras, Portugal (sponsor FEBS)
- 2013 “Structural basis for the lysis trigger of endolysins targeting Clostridia bacteria”/Invited presentation
Sabanci University , Istanbul, Turkey
- 2013 EMBO Practical Course “High-throughput Protein Production and Crystallization”/Teaching lectures
Didcot, United Kingdom (sponsor EMBO)
- 2014,2016 Biostruct-X Course “Strategic pipeline planning: from sample preparation to 3D structure determination with bioSAXS and other biophysical techniques” /Teaching lectures/tutor
Athens, Greece
- 2014 “Counting sulfur atoms on PROXIMA I”/Invited presentation
Saint Aubin, France
- 2014 “The crystal structure of netrin-1 in complex with DCC reveals the bifunctionality of netrin-1 as a guidance cue”/Selected presentation from abstract
Gordon Research Conference Hong Kong, China
- 2014 “The use of bacteriophage proteins to stem infection by Clostridia bacteria”/Invited presentation
University of Muenster, Germany
- 2015 “Sample preparation & characterization facility”/Invited presentation
Univerity of Milan, Italy
- 2015 “The Sample Preparation & Characterization Facility: modular sample services“, Biostruct-X Industry meeting, Hamburg, Germany
- 2015 “How netrin switches from attraction to repulsion”/Invited presentation
VIB Leuven, Belgium
- 2016 “How netrin switches from attraction to repulsion”/Invited presentation
VIB Ghent, Belgium

- 2016 “A molecular handshake between netrin and draxin”/Invited presentation
Xian 4th Military Hospital Microsympsium, China
- 2016 “A recipe to make superendolysins for the efficient eradication of Clostridia species”/Keynote speaker
Phage Therapy 2016, Paris, France
- 2016 “Sample preparation and optimization at EMBL Hamburg”/Facility presentation
iNEXT User meeting, Madrid, Spain
- 2016 “A secondary translation product regulates the activity of the CTP1L endolysin”/Leynote speaker
Lysin meeting, Rockefeller University, NYC, USA
- 2016 “Molecular Mechanisms of netrin-mediated axon guidance”/Invited presentation
EMBO Conference on Molecular Machines, Heidelberg, Germany (sponsor EMBO)
- 2017 “A secondary translation product regulates the activity of the CTP1L endolysin”/Invited presentation
Bacteriophage 2017, online conference
- 2017 “Structural insights into netrin signaling”/Invited presentation
McGill University, Montreal, Canada
- 2017 “Streamlined sample characterization and delivery for SAXS and macromolecular crystallography”, MIT – PIER Hamburg Workshop in Boston, USA
- 2017 “Structural investigations into netrin signaling and clathrin endocytosis”/Invited presentation
UC San Diego, USA
- 2018 “Structural studies reveal a role for netrin-1 in axon fasciculation through draxin and DCC”/Selected presentation from abstract
Cold Spring Harbor Meeting on Molecular Mechanisms of Neuronal Connectivity
- 2018 “Structural studies reveal how netrin engages its receptors”/Invited presentation
Capital University, Beijing, China
- 2018 “Structural studies reveal how netrin engages its receptors”/Invited presentation
Hangzhou University, Hangzhou, China
- 2018 “DSCAM is an adhesion sensor”/Invited presentation
VIB Leuven, Belgium
- 2020 “Netrin synergizing activity factors affect conditional adhesion between neurons”
Cold Spring Harbor Meeting, Cold Spring Harbor, United States
- 2021 “Down syndrome cell adhesion molecule (DSCAM): an adhesion sensor?”/Selected presentation from abstract, EMBO Workshop on Molecular Neurobiology, online meeting.
- 2022 “Developing antibodies to study neural receptors”, EMBO Workshop on Molecular Neurobiology, Crete, Greece
- 2023 “Connecting neuronal cell migration signaling pathways”/Invited presentation,
Biochemistry Department seminar series at the University of Chicago, USA
- 2023 “Generating ligand blocking antibodies for neuronal receptors ROBO and DCC”/Invited presentation, 2nd Meeting on the Neuronal Surfaceome in Circuit Formation: From Structure to Function, Lake Scanno, Italy
- 2023 “Developing synthetic antibodies for the human surfaceome at the Institute for protein Innovation”/Invited presentation, BioDrug conference, Riga, Latvia
- 2024 “A minimalist Fab library for antibody discovery”/Selected presentation from abstract,
Affinity Proteomics meeting in Alpbach
- 2024 “Developing antibodies for neuroscience applications”/Invited presentation, First Annual Ycharos Meeting, McGill University, Montreal, Canada
- 2024 “Developing antibody panels for neuronal migration and synapse formation”/Invited presentation, EMBO Workshop on Molecular Neurobiology, Crete, Greece

- 2024 „Introduction to the Institute for Protein Innovation“/Invited presentation, Frontiers in Neuroscience Meeting, Chan Zuckerberg Initiative, Menlo Park, USA
- 2025 „Developing antibodies for the synaptic cleft“/Invited presentation, CZI Investigator meeting, Chan Zuckerberg Initiative, San Jose, USA
- 2025 „High-throughput protein expression screening and production of cell surface protein ectodomains“/Invited presentation, PEGS Boston, Boston, USA
- 2025 „Developing synthetic affinity reagents for neuroscience applications“/Invited presentation, iPSC OPS Workshop, Chan Zuckerberg Initiative, New York City, USA
- 2025 „Reagent antibody panels for neuronal receptor–ligand families“/Sponsorship talk, AXON2025, Rotterdam, The Netherlands
- 2025 „Development of recombinant affinity reagents for model organisms“/Selected presentation from abstract, ZDM18, Boston, USA

Report of Technological and Other Scientific Innovations

- 2013-2016 *RUBIC screens for sample optimization commercialized by Molecular Dimensions*
Development of two sample optimization screens for macromolecules that can be used to search for optimal purification and storage conditions using differential scanning fluorimetry (Thermofluor) or light scattering. A 96 condition Buffer screen covers common buffers over a wide pH range combined with different salt concentrations. An Additive screen can be used after the most optimal buffer has been found, to test the effect of chemicals commonly used in protein purification and storage.
- 2011-2016 *Development of a combined purification and characterization pipeline on the P12 BioSAXS beamline at EMBL Hamburg*
To optimize macromolecular sample delivery at the BioSAXS beamline, I have developed a pipeline for sample quality control, purification and characterization in collaboration with the group of Dmitri Svergun. We created partnerships with Malvern Instruments Ltd (United Kingdom) and XtalConcept GmbH (Germany) to design an online size exclusion chromatography system coupled to static & dynamic light scattering.
- 2024 Development of a FAB yeast display library for IPI, incorporating state-of-the-art combinatorial oligo synthesis to deliver an antibody discovery library that creates reagent antibodies for cell surface receptors in high-throughput.
- 2024 Development of the mammalian expression vector pTipi for transient expression of glycoproteins, available through Addgene under an OpenMTA license.

Report of Education of Patients and Service to the Community

- No presentations below were sponsored by 3rd parties/outside entities
- Those presentations below sponsored by outside entities are so noted and the sponsor(s) is (are) identified.

Activities

- 2016 European Learning Laboratory for the Life Sciences event “Bringing structures to life- new ways of teaching biology” for high school teachers (2016)
- 2 day course on basics of structural biology for high school teachers from around Europe

2018-2019 University of Applied Sciences in Flensburg, Germany

Adaptation of mammalian expression and protein production protocol for undergrad practical course

Report of Scholarship

ORCID: 0000-0003-2872-6279

Google Scholar ID: <https://scholar.google.com/citations?user=uOLD9-EAAAAJ>

Peer-Reviewed Scholarship in print or other media:

Research Investigations

1. Matias PM, Morais, J, Coelho, AV, **Meijers, R**, Gonzalez, A, Thompson, AT, Sieker L, LeGall J, Carrondo MA. A preliminary analysis of the three-dimensional structure of di-haem split-Soret cytochrome c from *Desulfovibrio desulfuricans* ATCC 27774 at 2.5-Å resolution using the MAD phasing method: a novel cytochrome fold with a stacked-haem arrangement. *JBIC* 1997 Aug 1;2(4):507–514.
2. Adolph HW, Zwart P, **Meijers R**, Hubatsch I, Kiefer M, Lamzin V, Cedergren-Zeppezauer E. Structural basis for substrate specificity differences of horse liver alcohol dehydrogenase isozymes. *Biochemistry*. 2000 Oct 24;39(42):12885-97.
3. **Meijers R**, Morris RJ, Adolph HW, Merli A, Lamzin VS, Cedergren-Zeppezauer ES. On the enzymatic activation of NADH. *J Biol Chem*. 2001 Mar 23;276(12):9316-21.
4. Wang JH, **Meijers R**, Xiong Y, Liu JH, Sakihama T, Zhang R, Joachimiak A, Reinherz EL. Crystal structure of the human CD4 N-terminal two-domain fragment complexed to a class II MHC molecule. *Proc Natl Acad Sci U S A*. 2001 Sep 11;98(19):10799-804.
5. Tan K*, Zelus BD*, **Meijers R***, Liu JH, Bergelson JM, Duke N, Zhang R, Joachimiak A, Holmes KV, Wang JH. Crystal structure of murine sCEACAM1a[1,4]: a coronavirus receptor in the CEA family. *EMBO J*. 2002 May 1;21(9):2076-86. (* contributed equally)
6. **Meijers R**, Blagova EV, Levdikov VM, Rudenskaya GN, Chestukhina GG, Akimkina TV, Kostrov SV, Lamzin VS, Kuranova IP. The crystal structure of glutamyl endopeptidase from *Bacillus intermedius* reveals a structural link between zymogen activation and charge compensation. *Biochemistry*. 2004 Mar 16;43(10):2784-91.
7. **Meijers R**, Lai CC, Yang Y, Liu JH, Zhong W, Wang JH, Reinherz EL. Crystal structures of murine MHC Class I H-2 D(b) and K(b) molecules in complex with CTL epitopes from influenza A virus: implications for TCR repertoire selection and immunodominance. *J Mol Biol*. 2005 Feb 4;345(5):1099-110.
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Thesis:

Title: The activation of NADH in liver alcohol dehydrogenase

Institute: Van 't Hoff Institute for Molecular Sciences (HIMS), University of Amsterdam, The Netherlands

Permalink: <https://hdl.handle.net/11245/1.187186>

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings:

DCC collaborates with Draxin to guide commissural axons. E Avilés, A Yung, Z DeLoughery, **R. Meijers**, Jia-Huai Wang, Lisa Goodrich, Cold Spring Harbor meeting on Neuronal Connectivity, Cold Spring Harbor, USA 2022

Narrative Report

My academic activities center around protein science, with a focus on cell surface receptor engineering and antibody discovery for neuroscience applications. I have been a research group leader at the European Molecular Biology Laboratory (EMBL) Hamburg Outstation in Germany for ten years, which is an intergovernmental organization serving member states in Europe as well as India, Australia and Argentina. I then joined the Institute for Protein Innovation initially to build an antibody platform using display technologies and machine learning. As Senior Director, I led a group of 20 researchers to make synthetic human antibodies for cell surface receptors and their ligands. Since 2024, I am building a neuroscience team that develops neuronal assays using IPI's antibodies and addresses fundamental questions around neuronal migration and synapse formation. I also hold a part-time lectureship in the Department of Biological Chemistry and Molecular Pharmacology at Harvard Medical School.

Approximately 60 % of my efforts relate to molecular biology research to develop synthetic antibodies for cell surface receptors and their ligands. Another 20 % is focused on the establishment of facilities for protein science and developing tools for general use by the protein science research community. Finally, about 20 % of my efforts are directed towards the education of the next generation of protein scientists.

Area of Excellence- Investigation

As a protein scientist, I combine protein engineering synthesis techniques to study cell surface receptors involved in neuronal migration, synapse formation, immune recognition and tumor metastasis. At EMBL, I started a research program to understand how the guidance cue netrin interacts with its receptors and with environmental cofactors to promote neurogenesis and angiogenesis. This has resulted in two publications in the journal *Neuron*, I have raised \$2.5 million through EMBL and European commission funds to support this research and have received speaker invitations in Europe, China and the United States. I have also investigated other immune and neuronal receptors, notably the Down syndrome cell adhesion molecule (DSCAM), and major histocompatibility (MHC) molecules.

I have a long track record in community building, through the development of large infrastructures and the organization of international workshops and courses at these facilities. I founded the Sample Preparation and Characterization (SPC) lab at EMBL Hamburg to support biophysicists preparing samples for structural biology. The SPC lab is now managed by a former postdoctoral fellow from my research group, and serves over 200 individual researchers each year. I developed protein buffer optimization screens at the SPC facility, that are now widely distributed as RUBIC screens by Molecular Dimensions. At IPI, I have started to build a community around our neuroscience related antibodies, attracting dozens of academic groups working in molecular neuroscience from the US, Europe and Canada. IPI organizes regular workshops to exchange information on the performance of IPI's antibodies, as well as best practices in performing neuronal assays. The aim is to provide the field with impactful renewable recombinant antibodies with unique properties that enable neuronal cell typing and imaging.

At IPI, I built a synthetic antibody discovery platform where we are using yeast display to screen for human

FABs that bind cell surface receptors and ligands, using our internally developed library. The discovery process is aided by machine learning protocols that use the vast collection of already available binders to predict promising antibody candidates. Over the last four years, the platform has been streamlined to provide high-throughput antigen production/labelling, cell sorting, next generation sequencing and human antibody production and characterization, all within one team. We are now focusing specifically on developing antibodies for cell surface receptors involved in synapse formation, neuronal migration and glial cell phenotyping.

Teaching and Educational Leadership

AT EMBL, I have provided teaching and mentorship to students, postdocs, and junior faculty and its member states, taught several advanced courses, and organized national and international protein science courses. I have been the main organizer of the biannual protein expression, purification and characterization (PEPC) course from 2012-2016, which is one of the most prestigious protein science courses in Europe sponsored by the European Molecular Biology Organization (EMBO). This is an intensive one-week practical course given by leaders in the field of protein science for twenty international students, and it was always ten-fold oversubscribed. I have organized and taught at other EMBO and European Union sponsored courses on protein science tools and protocols in France, Germany, Greece, India, Portugal and the United Kingdom. At IPI, I am mentoring undergraduate and graduate students, creating an environment to learn to work in a lab that is equipped for high-throughput protein production, antibody discovery and protein engineering.

Summary

I apply and develop protein science tools to study ligand/receptor complexes that are crucial for neuronal migration, synapse formation, glial cell phenotyping and tumor biology. I share these tools and make them accessible to the community through open source deposition, commercialization and the teaching of best practices in protein sample preparation and characterization.