

ROB MEIJERS, PhD

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PROFILE

Protein scientist and research leader with 25 years of experience in the molecular and structural biology of cell surface receptors in the nervous and immune systems. At the Institute for Protein Innovation (IPI), I built and led a high-throughput, machine-learning-aided synthetic antibody discovery platform of ~20 scientists and now head IPI's neuroscience program, developing renewable recombinant antibodies for 400+ glycoproteins to study synapse formation, neuronal migration and glial cell identity. Former EMBL group leader and facility head with 50+ publications.

CORE EXPERTISE

- **Protein engineering:** built IPI's synthetic antibody platform (Fab yeast display, FACS, NGS, ML-guided selection, biophysical characterization); developed protein optimization screens (RUBIC) and open-source mammalian expression vectors (pTipi) for high-throughput antigen and glycoprotein production
- **Molecular neurobiology:** neuronal receptor–ligand signaling (netrin, DCC, UNC5, draxin, ROBO), DSCAM, synaptic adhesion (neurexins/neuroligins), mu-opioid receptor
- **Immunology:** MHC class I/II peptide presentation, CD4 and T-cell recognition, CEACAM1, bacteriophage endolysins
- **Structural biology & biophysics:** X-ray crystallography, SAXS, light scattering, native mass spectrometry, thermal shift assays
- **Leadership:** platform and facility building, team management, grant funding, organizing international courses and bringing research communities together for joint technology development in Europe and the US

PROFESSIONAL EXPERIENCE

Institute for Protein Innovation (IPI), Boston, MA

2019–present

Head of Neuroscience

2024–present

- Built a neuroscience team that develops neuronal assays with IPI antibodies and addresses fundamental questions in neuronal migration and synapse formation; supervise three scientists and a research technician.
- PI, Chan Zuckerberg Initiative grant (\$500K, 2024–2026): large-scale discovery of protein binders to map the neuronal synapse and detect glial cell types.
- Built a user community of 100+ molecular neuroscience labs across the US, Europe and Canada; organized workshops on neuronal receptor antibody panels.

Senior Director / Director, Antibody Platform

2021–2024

- Built and led a synthetic antibody discovery platform of 10 staff scientists and 11 research technicians, integrating antigen production and labeling, yeast display, cell sorting, next-generation sequencing, and antibody production and characterization in one team.
- Developed IPI's Fab yeast display library and a machine-learning-aided discovery pipeline for cell surface antigens (Kothiwala et al. Cell Systems 2026).
- PI, NSF/BMBF CRCNS grant (\$409K, 2022–2024): recombinant antibodies for the mu-opioid receptor to study receptor signaling and uptake.
- Member of the triumvirate leadership (2021) and Interim Executive Director of IPI (Apr–Nov 2022).

Head of Biological Discovery

2019–2021

- Led the Protein Group (seven scientists and technicians); established high-throughput expression screening of cell-surface ectodomains and developed the open-source pTipi mammalian expression vector (Addgene, OpenMTA).

Harvard Medical School, Boston, MA

2021–present

Visiting Lecturer, Biological Chemistry and Molecular Pharmacology, Blavatnik Institute

- Mentor undergraduate and graduate students in high-throughput protein engineering; panelist, HMS Therapeutics Graduate Program symposium on computation and AI in therapeutics development (2024).

European Molecular Biology Laboratory (EMBL), Hamburg, Germany

2009–2020

Group Leader; Head, Sample Preparation & Characterization Facility (2010–2018)

- Led a research program on how guidance cues engage neuronal receptors: solved the netrin-1/DCC structure explaining netrin's bifunctionality (Neuron 2014) and showed how draxin modulates netrin-mediated axon fasciculation (Neuron 2018).
- Extended work on immune and trafficking receptors: mechanisms of MHC class I peptide selection (Nature Communications 2020; Science Immunology 2019) and endocytic adaptor assembly (Nature Communications 2018).

- Founded the Sample Preparation & Characterization Facility serving 200+ researchers per year; developed the RUBIC buffer screens commercialized by Molecular Dimensions and an integrated SEC-light scattering pipeline on the P12 BioSAXS beamline.
- Raised \$2.5M through EMBL, European Commission (FP7/Horizon 2020) and BMBF funding as PI, co-PI and work package leader; mentored EIPOD/Marie Curie fellows and students who now lead teams, facilities and companies.
- Course Director of the EMBO Protein Expression, Purification and Characterization course (2012–2016); chaired EMBL PhD admissions and thesis advisory committees.

Synchrotron SOLEIL, Saint-Aubin, France — Staff Scientist

2006–2009

- Macromolecular crystallography beamline scientist; Course Director, EMBO Practical Course on X-ray structure determination (2008).

Dana-Farber Cancer Institute, Boston, MA — Postdoctoral Fellow

2000–2006

- With Jia-huai Wang, Ellis Reinherz and Dietmar Schmucker: structures of CD4 bound to MHC class II (PNAS 2001), the coronavirus receptor CEACAM1 (EMBO J 2002), MHC class I with influenza epitopes (J Mol Biol 2005), and the basis of Dscam isoform specificity (Nature 2007).

EDUCATION

PhD, Chemistry — University of Amsterdam / EMBL Hamburg (EMBL predoctoral fellow)	2001
MA, Chemistry — University of Amsterdam (Erasmus fellow, ITQB Oeiras, Portugal)	1996

RECENT PUBLICATIONS

1. Cooper CDO, ..., **Meijers R**, ..., Burgess-Brown NA. "EXPERT": a practical and forward-looking guide to capturing protein expression and purification metadata to develop machine learning models. J Biol Chem. 2026. doi: 10.1016/j.jbc.2026.113610.
2. Kothiwala D, ..., Springer TA, Marks DS, **Meijers R**. High-throughput machine learning-aided antibody discovery for cell surface antigens. Cell Syst. 2026;17(8):101645.
3. Yang C, Soni R, ..., Walton CJW, **Meijers R**, Zhu H. Evaluating codon optimization strategies for mammalian glycoprotein production with an open-source expression vector. bioRxiv. 2026. doi: 10.64898/2026.03.18.712111.
4. Avilés EC, DeLoughery Z, Yung AR, Wang JH, **Meijers R**, Goodrich L. Modularity in the DCC extracellular domain elicits distinct effects on axon guidance. bioRxiv. 2025. doi: 10.64898/2025.12.11.693717.
5. Zhu S, Jaworski A, **Meijers R**. Expanding ligand-receptor interaction networks for axon guidance: structural insights into signal crosstalk and specificity. Curr Opin Neurobiol. 2025;92:102999.
6. Kahn RA, ..., **Meijers R**, ..., Longworth S. Antibody characterization is critical to enhance reproducibility in biomedical research. eLife. 2024;13:e100211.
7. Hao Y, ..., **Meijers R**, Li J, Springer TA. Synthetic integrin antibodies discovered by yeast display reveal α V subunit pairing preferences with β subunits. MAbs. 2024;16(1):2365891.
8. Ghosh A, Yang C, Lloyd K, **Meijers R**. High-throughput protein expression screening of cell-surface protein ectodomains. Methods Mol Biol. 2024;2810:301-16.
9. Qin X, ..., **Meijers R**, ..., George RE, Feng H. CKLF instigates a "cold" microenvironment to promote MYCN-mediated tumor aggressiveness. Sci Adv. 2024;10(11):eadh9547.
10. Priest JM, Nichols EL, Smock RG, ..., **Meijers R**, Shen K, Özkan E. Structural insights into the formation of repulsive netrin guidance complexes. Sci Adv. 2024;10(7):eadj8083.

SERVICE & RECOGNITION

- **Advisory:** Scientific Advisory Board, VIB GeneCorner, Ghent (2020–2025); PIER Executive Board, University of Hamburg/DESY (2012–2014).
- **Review:** ERC Synergy, EU Marie Skłodowska-Curie, ANR, DFG, NWO and others; reviewer for Nature, Nature Biotechnology, Neuron, Nature Communications, PNAS, Science Advances.
- **Recent invited talks:** Neuro Winter Summit, Hokkaido, Japan (2026); PEPTALK, San Diego (2026); European Synapse Meeting, Leuven, Belgium (2026); AXON 2025, Rotterdam, the Netherlands (2025); CZI Investigator Meeting (2025); PEGS Boston (2025); YCharOS Annual Meeting, McGill (2024); EMBO Molecular Neurobiology workshop Crete (2024).