DR. EVA BERTOSIN

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Short Summary

- Assistant professor at Bijvoet Centre for Biomolecular Research (Utrecht University, the Netherlands)
- Publication experiences in international journals
- Student supervision and teaching experiences
- Methods: DNA origami, protein functionalization, single-molecule fluorescence microscopy, (cryo-) transmission electron microscopy, cryo-electron tomography, liposomes
- First revisions experiences for *Nature Communications*

Academic Education

Nov 2021-
April 2025

Postdoctoral Research

Bionanoscience Department at Technical University Delft (the Netherlands)
Advisor: Prof. Dr. Cees Dekker

- Biomimetic systems for studying biophysical principles of transport through the nuclear pore complex (NPC)
- Cryo-EM of solid-state nanopores functionalized with NPC proteins
- Application of DNA origami for single-molecule studies

Jul 2017-
Oct 2021

Ph.D. in Biophysics

Technical University Munich (Germany)
Advisor: Prof. Dr. Hendrik Dietz
A synthetic DNA rotary mechanism with coordinated coupled motion

- Design, production, and characterization of higher-order DNA origami nanostructure assemblies
- Single-particle measurements and analysis via total internal reflection fluorescence microscopy (TIRFM)
- (Cryo-)transmission electron microscopy and cryo-electron tomography. Experience with different microscopes: Philips CM-100, Tecnai Spirit (Thermofisher Scientific), Titan Krios (Thermofisher Scientific), Jeol JEM 3200FSC; and different 3D reconstruction software: *Relion, Cryosparc, Etomo*

Apr 2015-
Apr 2017

MSc. Biophysics

Technical University Munich (Germany)
Final grade: 1.0 (A)
Thesis: *Cryo-EM of tight-fitting DNA mechanisms*
Supervisor: Prof. Dr. Hendrik Dietz

Jun 2014-
Sep 2014

Research Internship

Max-Planck-Institute for Physics (Munich, Germany)
Supervisor: Dr. Koji Noda

Oct 2011-
Dec 2014

BSc. Physics

Università degli Studi di Padova (Italy), Erasmus at Georg-August-Universität Göttingen (Germany)
Final Grade: 95/110 (B)
Thesis at Max-Planck-Institute for Physics (Munich, Germany): *Study of the response of oscillometers on the MAGIC telescopes structure*
Supervisors: Prof. Dr. Mosè Mariotti, Dr. Koji Noda, Dr. Michele Doro

Work Experience

May 2025-present
Assistant professor
Bijvoet Centre for Biomolecular Research at Utrecht University (the Netherlands)

Apr 2017-Jan 2021
Scientific Staff at tilibit nanosystems GmbH (Munich)
Mini job as R&D scientist
- Design, folding, and characterization of custom DNA origami nanostructures
- Design, 3D prints, and assembly of a customized gel-purification machine

Dec 2015-Feb 2017
Student Assistant at TU Munich
Student assistant at Biomolecular Nanotechnology chair
- Design, folding, and characterization of DNA origami nanostructures
- Responsible for the management of 3D printer Z printer 450 (Z corporation)

Publications

* Equally contributing authors, ° Co-corresponding authors

1. K.N. Baumann, E. Bertosin, A. Barth, C. Dekker, R.Y.H. Lim, *Elucidating the nanoscopic organization and dynamics of the nuclear pore complex*, **Nucleus**, under review
2. C. Kriebisch, O. Bantysh, L. Baranda, A. Belluati, E. Bertosin, et al., *A roadmap towards the synthesis of Life*, **Chem** (2025)
3. Z. Yu*, A. Baptist*, S. Reinhardt, E. Bertosin, C. Dekker, R. Jungmann, A. Heuer-Jungemann°, S. Caneva°, *Compliant DNA Origami Nanoactuators as Size-Selective Nanopores*, **Advanced Materials** (2024)
4. C. Wen, E. Bertosin, X. Shi, C. Dekker, S. Schmidt, *Orientation-locked DNA origami for stable trapping of small proteins in the NEOtrap,* **Nano Letters** (2022)
5. A. Pumm, W. Engelen, E. Kopperger, J. Isensee, M. Vogt, V. Kozina, M. Kube, M. Honemann, E. Bertosin, M. Langecker, R. Golestanian, F. Simmel, H. Dietz, *A DNA origami rotary ratchet motor*, **Nature** (2022)
6. E. Bertosin, C. Maffeo, T. Drexler, M.N. Honemann, A. Aksimentiev, H. Dietz, *A nanoscale reciprocating rotary mechanism with coordinated mobility control*, **Nature Communications** (2021)
7. E. Bertosin*, P.M. Stömmer*, M. Wenig, M.N. Honemann, H. Dietz, *Cryo-Electron Microscopy and Mass Analysis of Oligolysine-Coated DNA nanostructures*, **ACS Nano** (2021)
8. M. Lakemeyer, E. Bertosin, F. Möller, D. Balogh, R. Strasser, H. Dietz, S.A. Sieber, *Tailored Peptide Phenyl Esters Block ClpXP Proteolysis by an Unusual Breakdown into a Heptamer–Hexamer Assembly*, **Angewandte Chemie International Edition** (2019)
9. P. Ketterer*, A.N. Ananth*, D.S. Laman, A. Mishra, E. Bertosin, M. Ganji, J. van der Torre, P. Onck, H. Dietz°, C. Dekker°, *DNA origami scaffold for studying intrinsically disordered proteins of the nuclear pore complex*, **Nature Communications** (2018)
10. B. Bräuning*°, E. Bertosin*, F. Praetorius, C. Ihling, A. Schatt, A. Adler, K. Richter, A. Sinz, H. Dietz, M. Groll, *Structure and mechanism of the two-component α-helical pore-forming toxin YaxAB*, **Nature Communications** (2018)

Book Chapters

1. E. Bertosin, A. Pumm, *Dynamic DNA nanostructures*, in *The Art of Molecular Programming*, in preparation

Committees

- Committee member for Kavli Best Publication Prize 2025

Research Grants and Awards

- NWO-XS grant 2023 (Round Open Competition Domain Science package 23-3, the Netherlands). Project title: *Dynamic gatekeepers: size-tunable nanopores for selective transport across membranes*, 50k €, project duration: 7 months
- Laureate WIMA (Women Interactive Material Award) 2022
- Finalist of the CeNS Nano-Innovation Awards 2021 for excellent research in nanoscience in Bavaria
- Erasmus mobility program 2013-2014, awarded through University of Padua (Italy)

Invited Talks

April 2024 *Nanopore-based biomimetic systems to study the nuclear pore complex,* at Interdisciplinary challenges in non-equilibrium physics International Workshop (Dresden, Germany)

Sept 2022 *DNA origami, proteins and lipids: successful combo to re-build cellular systems from scratch,* at Woman Interactive Material Award 2022 (Aachen, Germany)

Talks and Posters

Feb 2025 Poster: *Tunable DNA origami nanopores for studying the nuclear pore complex*, at BPS2025 (Los Angeles, USA)

Oct 2024 Talk: *Biomimetic nuclear pore complexes*, at NWO Dutch Biophysics Conference (Vendhoven, the Netherlands)

Jun 2024 Talk: *Visualization and transport through biomimetic nuclear pore complexes,* at Selective transport control in biological and biomimetic nanopores (Ascona, Switzerland)

Feb 2024 Talk and poster: *Visualization and transport through biomimetic nuclear pore complexes*, at Biophysical Society Meeting (Philadelphia, U.S.A.)

Oct 2023 Poster: *Biomimetic nanopores for studying transport through the nuclear pore complex via cryo-electron microscopy*, at NWO Dutch Biophysics Conference (Vendhoven, the Netherlands)

Mar 2023 Talk: *Towards building an artificial nucleus*, at Engineering of Life Workshop (Munich, Germany)

Nov 2022 Poster: *Biomimetic nanopores for studying transport through the nuclear pore complex via cryo-electron microscopy,* at Nanopore Protein Sequencing conference (Delft, the Netherlands)

Oct 2022 Talk: *Artificial biomimetic systems for studying transport through the nuclear pore complex*, at NWO Dutch Biophysics Conference (Vendhoven, the Netherlands)

July 2022 Talk: *Artificial biomimetic systems for studying transport through the nuclear pore complex,* at Life at the Edge conference (Potsdam, Germany)

Apr 2021 Talk: *A nanoscale reciprocating rotary mechanism with coordinated mobility control*, at FNANO 2021 conference (online)

Oct 2020 Talk: *Cryo EM of a DNA origami stator/rotor mechanism*, at FDN 2020 conference, Rome (Italy)

Jul 2019 Poster: *Cryo EM-driven design of DNA mechanisms and machines* at iPols Conference, Munich (Germany)

Sep 2018 Poster: *Cryo EM-driven design of DNA mechanisms and machines* at CeNS Workshop, Venice (Italy)

Mar 2018 Talk and poster: *Cryo EM-driven design of DNA mechanisms and machines* at CEM3DIP 2018: of macromolecular assemblies and cellular tomography, EMBO, New Delhi (India)

Teaching Activities

2023 Co-supervision of a journal club for undergraduate Honour Students of the Bionanoscience Program, TU Delft. Weekly meetings with single students to help them prepare the materials for the journal club. Leading of weekly discussions among all the students about scientific articles.

2019 Development of a new advanced lab course for bachelor and master students: *DNA Origami*, TU Munich, including development of new experiments for the students, a new guide comprising theoretical background and exercises.

2017-19 Supervision of bachelor and master students for an Advanced Lab Course: *DNA origami*, TU Munich. Weekly supervision of the students during their lab work; evaluation and discussion of their lab reports.

Supervision Experience

2024-25 Bram van Uunen (Bachelor's thesis, TU Delft)

2024-25 Mandy Grooters (Master's thesis, TU Delft)

2024 Viktor Gilin, *DNA Origami Production for a Bio-mimetic Peroxisome Pore* (Bachelor's thesis, TU Delft)

2023-24 Jochem Nederlof, *Inserting DNA-origami nanopores into artificial membranes using arrayed lipid bilayer chambers* (Bachelor's thesis, TU Delft)

2023 Marco Piacentini, *Rationally Designed Nanoturbines: The Quest of Piercing Droplet Interface Bilayers with Ultrawide DNA Origami Nanopores* (Master's thesis, TU Delft)

2023 Owen Luflos, *Engineering DNA Origami-Lipid Bilayer Hybrid Channels for Synthetic Membrane Transport* (Bachelor's thesis, TU Delft)

2023 Yuchen Yan, *Purification of protein-functionalized DNA-origami nanostructures. Towards a biomimetic nuclear pore complex* (Bachelor's thesis, TU Delft)

2019 Thomas Drexler, *Cryo-EM of a rotary DNA origami structure* (Bachelor's thesis, TU Munich)

2018 Alexander Koch, *Characterization and assembly of a DNA origami rotary structure* (Bachelor's thesis, TU Munich)

Outreach

Apr 2024 Interview for C2W on de novo protein design, commenting *Huddy et al., Nature 2024*

May 2023 Presentation about *DNA origami* to the general public during Pint of Science 2023 event (the Hague)

May 2022 Invited talk for a molpigs (Molecular Programming Interest Group) podcast episode

Memberships and Societies

- SIBBM (Italian Society for Biophysics and Molecular Biology)
- BPS (Biophysical Society)

Mentoring Activities

2023 - present Official mentor for graduate student B. Fielden in Prof. Hendrik Dietz' group, TU Munich

2022 Mentoring activities for students at the High School T. L. Caro (Cittadella, Italy)

Event Organization

2022-24 Member of the Social Committee at the Bionanoscience Department (TU Delft), responsible for organizing department-wide monthly social activities

2018-19 Organization of winter schools for Prof. Dr. H. Dietz' group, including arrangement of workshops, talks and invitation of external speakers

Soft Skills Workshops

May 2020	Scientific paper writing (TUM graduate school)
Sep 2019	How to present posters at international conferences (TUM graduate school)
Jun 2019	Scientific presentations (ProLehre TUM)
Sep 2018	Reading strategies for scientific staff (TUM graduate school)
Nov 2017	Supervising students' thesis (TUM graduate school)

Further Skills

Languages	Italian (mother tongue), German (C1), English (C1), Dutch (A2), basic understanding of French and Spanish
Software	MATLAB, Python, Mathematica; Chimera, FIJI, IGOR pro, Adobe Illustrator; CaDNAno; Relion, Etomo, Cryosparc; FreeCAD, Blender, Cinema4D