

Curriculum Vitae

Dr. Georg Krainer

Assistant Professor of Molecular Biophysics

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Research Interests

Membrane Proteins & GPCRs: structural dynamics, molecular interactions, and functional mechanisms of signaling and allosteric regulation

Biosensing & Diagnostics: Molecular detection strategies and quantitative assay platforms for biomedical and analytical applications

Biomolecular Condensates: Biophysical principles of phase separation, molecular organization, and regulation of functional biomolecular assemblies.

Protein Engineering: Directed evolution & rational design of enzymes for mechanistic studies and biotechnological innovation

Methods & Technologies: Single-molecule fluorescence, microfluidics & advanced microscopy

Positions

Assistant Professor (2025 – present)

University of Graz, Institute of Molecular Biosciences (IMB), Graz, Austria

Research Group Leader (2023 – 2025)

University of Graz, Institute of Molecular Biosciences (IMB), Graz, Austria

Senior Scientist (2020 – 2025) & Co-Founding Team Member, Transition Bio Ltd., UK

Postdoctoral Fellow (2019 – 2023)

University of Cambridge, Department of Chemistry & Centre for Misfolding Diseases, UK

Education

PhD in Biophysics (2018), *summa cum laude*, University of Kaiserslautern & Technical University of Dresden, Germany

Diploma in Biochemistry (2011), obtained with the highest grade, Free University of Berlin, Germany

Grants & Fellowships (selected)

ERC Starting Grant (2025–2030)

European Research Council (ERC)

UFO Award (2025)

State of Styria, Austria

Excellence Fellowship (2023–2025)

University of Graz, Austria

Herchel Smith Research Fellowship (2020–2023)

University of Cambridge, UK

Marie Skłodowska-Curie Fellowship (2019–2021)

European Commission

Awards (selected)

Young Investigator Award (2022)

German Biophysical Society, Germany

Young Scientist Award (2020)

State of Carinthia, Austria

PhD Award (2019)

University of Kaiserslautern, Germany

William F. Giauque Memorial Award (2018)

CALCON, USA

Award of Excellence (2012)

Free University of Berlin, Germany

Publications (selected)

Quantifying collective interactions in biomolecular phase separation. *Nat Commun*, 2025, 16, 7724.

Single-molecule digital sizing of proteins in solution. *Nat Commun*, 2024, 15, 7740.

Direct digital sensing of protein biomarkers in solution. *Nat Commun*, 2023, 14, 653.

Surface electrostatics govern the emulsion stability of biomolecular condensates. *Nano Lett*, 2022, 22, 612.

High-resolution biomolecular condensate phase diagrams with a combinatorial microdroplet platform. *Nat Commun*, 2022, 13, 7845.

The Hsc70 disaggregation machinery removes monomer units directly from α -synuclein fibril ends. *Nat Commun*, 12, 5999.

Chaperones Skp and SurA dynamically expand unfolded outer membrane protein X and synergistically disassemble oligomeric aggregates. *Proc Natl Acad Sci*, 2022, 119, e2118919119.

SDS-induced multi-stage unfolding of a small globular protein through different denatured states revealed by single-molecule fluorescence. *Chem Sci*, 2020, 11, 9141.

Reviews (selected)

Unraveling allosteric signaling of G protein-coupled receptors (GPCRs) by single-molecule fluorescence. *Biophys Rev*, 2025.

Microfluidics for protein interaction studies: current methods, challenges, and future perspectives. *Eur Biophys J*, 2025.

Structural dynamics of membrane-protein folding from single-molecule FRET. *Curr Opin Struct Biol*, 2019, 58, 124.