



FLAGSHIP INITIATIVE
ENGINEERING
MOLECULAR SYSTEMS



UNIVERSITÄT
HEIDELBERG
ZUKUNFT
SEIT 1386

COLLOQUIUM ENGINEERING MOLECULAR SYSTEMS - In Person -

ABISHEK JALAN will talk about **DECIPHERING THE CODE FOR COLLAGEN FOLDING** in the “Engineering Molecular Systems” colloquium on **November 28th 2022** at **5 p.m.** (CET) hosted by the Flagship Initiative Engineering Molecular Systems of Heidelberg University. The colloquium will take place at the CAM building (Im Neuenheimer Feld 225, seminar room 01.413).



Abishek Jalan
University of Bayreuth

November 28th 2022
5 pm CET

CAM building
Im Neuenheimer Feld 225
seminar room 01.413

ABSTRACT:

Molecular understanding of how proteins fold is important for engineering better performing proteins. Examples of the reverse paradigm, where empirical lessons learned during protein design help understand folding are rare. Here, I present one such



FLAGSHIP INITIATIVE
ENGINEERING
MOLECULAR SYSTEMS



UNIVERSITÄT
HEIDELBERG
ZUKUNFT
SEIT 1386

example. Collagens are highly complex and multidomain human proteins that tend to quickly aggregate upon isolating from tissues. Thus, its structure, folding and function is predominantly studied using peptides that mimic its native structure. A hallmark of this structure is a trimerized superhelix called the triple-helix. It has been shown that geometrically specific electrostatic interactions facilitate folding and stability of designed triple-helices. We show that these geometrically specific electrostatic interactions are abundant in human collagens and are a key determinant of successful folding.

BRIEF CV:

Group Leader University of Bayreuth (UBT), Germany, 2022-present
DFG Postdoctoral Fellow University of Bayreuth, Germany, 2020-2022
Humboldt Postdoctoral Fellow, University of Bayreuth, Bayreuth, DE 2017-2019
Newton International Fellow, University of Cambridge, Cambridge, UK 2015-2017
Parental leave, 2014-2015
PhD (Chemistry), Welch Foundation Predoctoral Fellow Rice University, USA, 2009-2014
MS (Thesis in Chemistry), Syracuse University, Syracuse, NY USA 2006-2009
MSc (Inorganic Chemistry), University of Delhi, New Delhi, India 2003-2005
BSc (Chemistry with Honours), University of Delhi, New Delhi, India 2000-2003

Current Projects:

- Understanding the molecular basis for the collagen-binding specificity of Discoidin Domain Receptors and how it influences receptor clustering, associated signalling pathways and crosstalk with other receptors, most notably integrins.
- Understanding the molecular basis for the interaction of collagen type IV with integrin- $\alpha1\beta1$.
- Investigating how collagens fold across the archae, bacteria, humans and viruses and its significance for the phenotypic severity of heritable collagen-related diseases in humans.
- Development of collagen-peptide toolkit for imaging diseased tissues in a collagen-specific manner.