DR. ADARSH KUMAR

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EXPERIENCE

MAY 2022 – PRESENT

POSTDOCTORAL RESEARCHER, STRUCTURAL GENOMICS CONSORTIUM AT GOETHE UNIVERSITY, FRANKFURT AM MAIN, GERMANY

Research:

- Generating protein-ligand interaction and structure datasets to train AI models (LigandAI)
- Developing inhibitors/binders for AAA+ proteins involved in chromatin modification and cancer development
- Next-gen degrader development
- Developing inhibitors/probes for less studied kinases (dark kinases)

General responsibilities:

- Crystallization and structure determination of protein-ligand complexes
- Protein purification for crystallography and compound libraries screening
- General structural biology support to projects in the lab

SEP 2018 – AUG 2021

POSTDOCTORAL RESEARCHER, THE FLORDIA STATE UNIVERSITY COLLEGE OF MEDICINE, TALLAHASSEE, FLORIDA, USA

Research:

- DNA base excision repair
    - hPolβ-DNA-ligands time-resolved crystallography
    - Developed biochemical assay to understand the relation between two distinct functions of hPolβ
- Understanding lesion-bypass by DNA polymerase IV (Dpo4)

Management:

- Inventory and lab management
- Training undergraduates, graduate students, and new postdocs
- Radiation, chemical, and biological safety

AUG 2012 – JAN 2018

RESEARCH FELLOW, CSIR-INSTITUTE OF MICROBIAL TECHNOLOGY, CHANDIGARH, INDIA

Research:

- Hypothetical essential proteins as potential drug targets
    - Rv2229c from *Mycobacterium tuberculosis*
    - Msmeg_4306 (Rv2229c homolog) from *Mycobacterium smegmatis*
- 3,4-dihydroxy-2-butanone-4-phosphate synthase (DHBPS) from *Vibrio cholera* (VribB, part of Riboflavin biosynthesis pathway) as a potential drug target
    - Structure solution and refinement of VribB crystals
    - Inhibition kinetics for VribB

EDUCATION

JAN 2018

PH.D., CSIR-INSTITUTE OF MICROBIAL TECHNOLOGY, CHANDIGARH, INDIA (JAWAHARLAL NEHRU UNIVERSITY, NEW DELHI)

Thesis title: "Structural and mechanistic insights into Rv2229c, an essential gene from *Mycobacterium tuberculosis*".

MAY 2011

M.SC., SRM UNIVERSITY, CHENNAI, INDIA

Dissertation title: "Drug Designing for Chorismate Mutase in *Mycobacterium tuberculosis*"

MAY 2009

B.SC., GARDEN CITY COLLEGE, BENGALURU (BANGALORE), INDIA (BANGALORE UNIVERSITY)

SKILLS

- Time-resolved macromolecular crystallography (diffusion trapping)
- Protein/complex crystallization using automation/robotics
- Crystallographic fragment screening (Xchem)
- Protein-DNA-ligand complexes
- Protein purification and characterization
- Synchrotron data collection
- In-house x-ray data collection
- Molecular biology and recombinant DNA technology
- Enzymatic assays
- Circular dichroism, Isothermal titration calorimetry, Microscale thermophoresis, Quench flow, DSF
- Bioinformatics

PUBLICATIONS

- Joel L. Syphers, Josephine A. Wright, Rebekah de Nys, Tharindie N. Silva, Laura Vrbanac, Kate R. Barratt, Julia Leeflang, Sadia T. Hasan, Sophie F. Thomson, **Adarsh Kumar**, Andreas Krämer, Christopher Lenz, Yi Sing Gee, Aeson Chang, Savannah Young, Erica K. Sloan, Stefan Knapp, Daniel L. Worthley, Siddhartha Mukherjee, Kieran Stockton, Daniel L. Priebbenow, Susan L. Woods, Jonathan B. Baell. 2026. Discovery of APO-50815, a potent WEE1 kinase inhibitor with exceptional efficacy against patient-derived colorectal cancer organoids, *EJMC* 312, 118838
- Julia Schönfeld, Steffen Brunst, Ludmila Ciomirtan, Lena Willmer, Michel A. Chromik, **Adarsh Kumar**, Timo Froemel, Nick Liebisch, Arne Hackspacher, Johanna H. M. Ehrler, Lukas Wintermeier, Christina Hesse, Jan Fiedler, Jan Heering, Hinrich Freitag, Patrick Zardo, Hans-Gerd Fieguth, Astrid Brüggerhoff, Josefine Jakob, Björn Häupl, Lilia Weizel, Astrid Kaiser, Manfred Schubert-Zsilavecz, Thomas Oellerich, Ingrid Fleming, Nils H. Schebb, Robert Fürst, Aimo Kannt, Stefan Knapp, Ewgenij Proschak, Kerstin Hiesinger. 2025. Structure-Based Design of PROTACS for the Degradation of Soluble Epoxide Hydrolase, *J. Med. Chem.* 68(13), 13728-13749
- Martin Schwalm , Johannes Dopfer , **Adarsh Kumar** , Francesco Greco , Nicolas Bauer , Frank Löhr , Jan Heering , Sara Cano Franco , Severin Lechner , Thomas Hanke , Ivana Bekic , Viktoria Morasch , Cristopher Lenz , Daren Fearon , Peter Marples , Charles Tomlinson , Lorene Brunello , Krishna Saxena , Nathan Adams , Frank von Delft, Susanne Muller , Alexandra Stolz , Ewgenij Proschak , Bernhard Kuster , Stefan Knapp, Vladimir Rogov. 2024. Targeting LC3/GABARAP for degrader development and autophagy modulation*, Nat. Comm.*

15, 1024

- Ajay Kumar, Rajender Kumar, Vishant Boradia, Himanshu Malhotra, **Adarsh Kumar**, Gandhari Shankar, Amar Jhadav, Edelli Jhansi, Subramanian Karthikeyan, Prabha Garg, Manoj Raje, Chaaya Iyengar Raje. 2024. The C-terminal lysine modulates enzyme activity, multifunctionality of *Mycobacterium tuberculosis* and human Glyceraldehyde-3-phosphate dehydrogenase, *The FEBS Journal*. 291(23), 5236-5255
- Lara Dötsch, Caitlin Davies, Elisabeth Hennes, Julia Schönfeld, **Adarsh Kumar**, Celine da Cruz Lopes Guita, Sasikala Thavam, Axel Pahl, Petra Janning, Sonja Sievers, Stefan Knapp, Eugen Proschak, Slava Ziegler, Herbert Waldmann. 2024. Discovery of the sEH Inhibitor Epoxykynin as Potent Kynurenine Pathway Modulator*, J. Med. Chem.* 67(6), 4691-4706
- Markus Schweipert, Thomas Nehls, Anton Frühauf, Cecilé Debarnot, **Adarsh Kumar**, Stefan Knapp, Frederik Lermyte, Franz-Josef Meyer-Al. 2024. The catalytic domain of free or ligand bound histone deacetylase 4 occurs in solution predominantly in closed conformation*, Prot. Sci.* 33(3), e4917
- Fang Li, W. Felix Zhu, Claire Empel, Oleksandr Datsenko**, Adarsh Kumar**, Yameng Xu, Johanna H. M. Ehrler, Iuliana Atodiresei, Stefan Knapp, Pavel K. Mykhailiuk, Ewgenij Proschak, Rene M. Koenigs. 2024. Photosensitization Enables Pauson-Khand-type Reactions with Nitrenes, *Science*, 383 (6682), 498-503
- **Adarsh Kumar**, Andrew J. Reed, Walter J. Zahurancik, Sahsha Daskalova, Sidney M. Hecht, and Zucai Suo. 2022. Interlocking activities of DNA polymerase β define the base excision repair pathway, *PNAS,* 119 (10), e2118940119
- **Adarsh Kumar** and Subramanian Karthikeyan. 2018. Structural characterization of msmeg_4306 from *Mycobacterium smegmatis, Acta Cryst. F* 74, 166-173
- Zeyaul Islam, **Adarsh Kumar**, Suruchi Singh, Laurent Salmon, and Subramanian Karthikeyan. 2015. Structural Basis for Competitive Inhibition of 3,4-Dihydroxy-2-butanone-4-phosphate Synthase from *Vibrio cholerae, J. Biol. Chem*., 290, 11293-11308

MEMBERSHIPS, FELLOWSHIPS, AND AWARDS

- Postdoctoral Research Award for outstanding achievement as a postdoctoral scholar, The Florida State University College of Medicine, Aug 2021.
- Associate Faculty Member, Structural Biology, F1000 Prime, October 2018 to September 2022
- Life member of the Indian Biophysical Society
- CSIR-Shyama Prasad Mukherjee Research Fellowship concurrent with the Ph.D. program, August 2012 to July 2017
- CSIR program on Youth for Leadership in Science in 2003
- Certificate of merit in science in AISSE 2003