



Kajal Kanchan

Professor and Former Ramalingaswami fellow

Specialization: *Biochemistry, Protein structure and function, Host-pathogen Interaction, Cell Signaling, Microbial pathogenesis, Gene Regulation*

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Dr. Kajal Kanchan obtained her PhD from University of Tuebingen, Germany in the area of Mycobacterial cell signaling and pathogenesis. Subsequently, she worked as a Marie Curie Postdoctoral fellow at University of Debrecen, Hungary, where she worked on Celiac disease, particularly characterizing Human transglutaminase 2 both biochemically and structurally. Later on she moved to University of Cambridge, UK, where she worked with histone variants and got an exposure in the area of transcription and gene regulation. With this diverse background and experience, she could successfully establish her research niche in the area of gene regulation in mycobacterial pathogenesis, upon returning back to India. She received the prestigious Ramalingaswami fellowship from DBT to work in the area of temperature signaling in mycobacterium. She worked initially at School of Biotechnology, JNU, New Delhi for three years before joining Amity Institute of Molecular Medicine and Stem Cell research. The broad goal of her research team is to explore how bacteria can sense and respond to changes in the environment. Her team is particularly using *M. tuberculosis* as model organism and trying to decipher the molecular basis of sensory perception and signal transduction and how these regulate the development and virulence of the Mycobacteria. To achieve her goals she is using genomics, proteomics and computational approaches to model transcriptional, post-transcriptional and translational regulation of this pathogen in the hope to find novel intervention measures to treat this deadly disease.

Research Projects:

1. Identifying novel transcriptional inhibitors for therapeutic targeting of *M. tuberculosis* SigE: ICMR (2024-2027)
2. Genome wide Identification of Tetratricopeptide Repeats (TPR) protein family from *M. tuberculosis* and their functional characterization in virulence: SERB-SRG (2022-2024)
3. Elucidation of Molecular Mechanism and Function of Mycobacterial SigE in Temperature Perception, Response and Pathogenesis. ICMR (2019-2022)
4. Temperature sensing mechanism in *M. tuberculosis* and its role in pathogenesis, Ramalingaswami fellowship, DBT (2016-2020)
5. Consultancy project on “ Evaluation and validation of antimicrobial activity of nanoparticle containing fabrics and its technical testing, from Vviman Medical Textiles, sister company of Suvi Exports. (2023-2024)
6. Study of in-depth genetic heterogeneity with respect to resistome and compensatory adaption of MDR Mtb clinical strains inside BM- Mesenchymal stem cells circulating in the North East Region” DBT (2019-2023)
7. Exploring the role of Bacterioferritin comigratory protein (Bcp and BcpB) in mediating antioxidant defense response and pathogenesis of Mycobacterium tuberculosis, Dr. D.S. Kothari Fellowship, UGC, 2015-2018.
8. Structure Determination of Alkyl hydroperoxidase (AhpC), a potential drug target against multidrug resistant bacteria, *Acinetobacter baumannii*”, SRG-SERB (2016, not availed)

Fellowships, Honors and Awards

1. Keystone symposia Global Health Travel Award funded by Bill and Melinda Gates Foundation to attend an international conference on on “ Tuberculosis: The host pathogen interface, held at Colorado USA from 23rd-28th March 2024
2. Global Health awards (Registration waiver) for attending the Keystone esymposia held at Colorado, USA titled “Tuberculosis: Science Aimed at Ending the Epidemic”, Dec 2020 and “Innovative Vaccine Approaches”, June 2021

3. Start-up Research Grant (SRG), SERB 2022
4. Ramalingaswami Fellowship Award, DBT (2016-2020)
5. Start-up research grant, DST (2016, not availed)
6. Dr. DS Kothari Postdoctoral Fellowship, UGC, 2015
7. Postdoctoral research funded by Marie Curie Program-European Research and Innovation (2011- 2013)
8. Postdoctoral research funded by Hungarian Scientific Research Fund (OTKA) (2013-2014)
9. PhD research funded by German Research Foundation (DFG), Germany (2006-2011)

Publications

1. Hritika Verma, Aditi Chauhan, Awanish Kumar, Manoj Kumar, Kajal Kanchan (2024), Synchronization of Mycobacterium life cycle: A possible novel mechanism of antimycobacterial drug resistance evolution and its manipulation. *Life Science Journal* 346, 122632. [IF 6.78]
2. Aditi Chauhan, Manoj Kumar, Awanish Kumar and **Kajal Kanchan** (2021) Comprehensive review on mechanism of action, resistance and evolution of antimycobacterial drugs. *Life Science* (274), 119301. [IF: 5.03]
3. Manoj Kumar*, Komal Sharma*, Akhilesh K. Yadav*, **Kajal Kanchan***, Madhu Baghel, Suneel Kateriya and Girdhar K. Pandey (2020) Genome-wide identification and biochemical characterization of calcineurin B-like calcium sensor proteins in *Chlamydomonas reinhardtii*. *Biochemical Journal* 477, 1879–1892. (*equal Contribution) [IF: 4.09]
4. Elvan Ergülen, Bálint Bécsi, István Csomós, László Fesus and **Kajal Kanchan*** (2016) Identification of DNAJA1 as a novel interacting partner and a substrate of human transglutaminase 2. *Biochemical Journal* 473, 3889–01. (*Corresponding author) (IF- 4.09)
5. Kajal Kanchan, Mónika Fuxreiter and Fesus László (2015), Physiological, pathological and structural implications of non-enzymatic interactions of multifunctional transglutaminase 2. *Cellular and Molecular Life Science* 72 (16), 3009-35 (IF- 9.2)
6. Joachim E Schultz, **Kajal Kanchan** and Miriam Ziegler (2014) Intra-protein signal transduction by HAMP domains: a balancing act. *International journal of Medical Microbiology* (305), 243-251. [IF: 3.6]
7. Kajal Kanchan, Elvan Ergulen, Róbert Király, Zsófia Simon-Vecsei, Mónika Fuxreiter and Fesus László (2013) Identification of a specific one amino acid change in recombinant human transglutaminase 2 that regulates its activity and calcium sensitivity. *Biochemical Journal*. 455 (3), 261-272 (IF- 4.09)
8. Kajal Kanchan, Jürgen Linder, Karin Winkler, Klaus Hantke, Anita Schultz, and Joachim E. Schultz (2010) Transmembrane Signaling in Chimeras of the Escherichia coli Aspartate and Serine Chemotaxis Receptors and Bacterial Class III Adenylyl Cyclases. *Journal of Biological Chemistry* 285, 2090- 2099 (IF- 5.15)
9. Praveen Kumar, **Kajal Kanchan**, Raimundo Gargallo and Shantanu Chowdhury (2005). Application of multivariate curve resolution for the study of folding processes of DNA monitored by fluorescence resonance energy transfer. *Analytical Chimica Acta* 536,135-143. [IF: 6.56]