

Manoj Kumar

Senior Research Fellow

RNA Biology Laboratory

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HIGHEST EDUCATION

PhD, AcSIR (2016 -)

RNA Biology Lab

CSIR-Institute of Genomics & Integrative Biology

Thesis title: To understand the role of DNA topology in regulating LncRNAs implicated in neural development.

Thesis Advisor: Dr. Debojyoti Chakraborty

RECENT PUBLICATIONS

Kumar, M., Gulati, S., Ansari, A. H., Phutela, R., Acharya, S., Azhar, M., ... & Chakraborty, D. (2021). FnCas9 based CRISPR diagnostic for rapid and accurate detection of major SARS-CoV2 variants on a paper strip. *Elife*, 10, e67130.

Azhar, M., Phutela, R., **Kumar, M.**, Ansari, A. H., Rauthan, R., Gulati, S., ... & Maiti, S. (2021). Rapid and accurate nucleobase detection using FnCas9 and its application in COVID-19 diagnosis. *Biosensors and Bioelectronics*, 183, 113207. * **Co-first author**

Acharya, S., Mishra, A., Paul, D., Ansari, A. H., Azhar, M., **Kumar, M.**, ... & Sharma, S. (2019). Francisella novicida Cas9 interrogates genomic DNA with very high specificity and can be used for mammalian genome editing. *Proceedings of the National Academy of Sciences*, pp: 201818461.

EXPERTISE FIELDS

Genome Editing | Molecular Neurobiology | Stem cell | 3D Cell Culture | ncRNAs | CRISPRdx | Single-cell |

Designing & Genome editing using CRISPR/Cas systems. Human/induced stem cell (h/iPSCs) culture maintenance & differentiation into 3D cerebral & cortical organoids. Single-cell expression analysis.

LANGUAGES | English (Full professional proficiency) | Hindi (Native proficiency) |

PAST RESEARCH EXPERIENCE

- **M.Sc dissertation** at University of Delhi South Campus, Delhi, India, 2015-2016 (12 months), **Prof. Debi P. Sarkar**
- **Newton Bhabha PhD Placement Programme** at Neural Stem Cell Biology Laboratory, Francis Crick Institute, London, UK, 2019 (4 months), **Dr. Francois Guillemot**

EDUCATION

M.Sc. (Biochemistry) (4th position) 2016

University of Delhi South Campus, New Delhi

B.Sc. Hons. (Biochemistry) (2nd position) 2014

Shivaji College, University of Delhi, New Delhi

Higher Secondary (12th) 2010

Kendriya Vidyalaya ASC Centre (S), Bangalore, India, C.B.S.E

Secondary (10th) 2008

Kendriya Vidyalaya ASC Centre (S), Bangalore, India, C.B.S.E

PERSONAL DETAILS

Date of Birth: 15th December 1992

Demography: Indian, Male

PUBLICATIONS

1. **Kumar, M.**, Gulati, S., Ansari, A. H., Phutela, R., Acharya, S., Azhar, M., ... & Chakraborty, D. (2021). FnCas9 based CRISPR diagnostic for rapid and accurate detection of major SARS-CoV2 variants on a paper strip. *Elife*, 10, e67130.
2. Azhar, M., Phutela, R., **Kumar, M.**, Ansari, A. H., Rauthan, R., Gulati, S., ... & Maiti, S. (2021). Rapid and accurate nucleobase detection using FnCas9 and its application in COVID-19 diagnosis. *Biosensors and Bioelectronics*, 183, 113207. * **Co-first author**
3. Acharya, S., Mishra, A., Paul, D., Ansari, A. H., Azhar, M., **Kumar, M.**, ... & Sharma, S. (2019). Francisella novicida Cas9 interrogates genomic DNA with very high specificity and can be used for mammalian genome editing. *Proceedings of the National Academy of Sciences*, pp: 201818461.
4. Chandra, S., **Kumar, M.**, Sharma, N. R., & Sarkar, D. P. (2019). Site-specific phosphorylation of villin remodels the actin cytoskeleton to regulate Sendai viral glycoprotein-mediated membrane fusion. *FEBS letters*.
5. Chandra, S., Kalaivani, R., **Kumar, M.**, Srinivasan, N., & Sarkar, D. P. (2017). Sendai virus recruits cellular villin to remodel actin cytoskeleton during fusion with hepatocytes. *Molecular biology of the cell*, 28(26), 3801-3814.

CONFERENCES AND WORKSHOPS

- **Manoj Kumar**, Debojyoti Chakraborty, "FnCas9 based low-cost CRISPR diagnostics for rapid detection of SARS-CoV2 and its major variants", Poster presentation at "Genome Engineering: CRISPR Frontiers (Virtual)" 18 – 20 August 2021 | CSHL, USA.
- 22nd EMBL PhD Symposium: The Roaring 20s: A New Decade for Life Sciences, Virtual (27-28 November 2020).
- **Manoj Kumar**, Debojyoti Chakraborty, "To study the role of DNA topology in regulating LncRNAs implicated in neural development using CRISPR/Cas9 edited cortical organoids", Poster presentation at EMBO | EMBL Symposium: Organoids: Modelling Organ Development and Disease in 3D Culture 21 - 24 Oktober 2020, Virtual.
- **Manoj Kumar**, Debojyoti Chakraborty, "To study the role of DNA topology in regulating LncRNAs implicated in neural development using CRISPR/Cas9 edited cortical organoids", Poster presentation at "Genome Engineering: CRISPR Frontiers (Virtual)" 19 – 21 August 2020 | CSHL, USA.
- EMBO | IndiaBioscience Grant Writing Workshop, 18 June & 10 July 2020| India.
- **Manoj Kumar**, Debojyoti Chakraborty, "To understand the role of DNA topology in regulating LncRNAs implicated in neural development using cortical organoids", Poster presentation at "Development and 3D Modeling of Human Brain neuroscience" 09 – 12 December 2019 | CSHL, NY, USA.
- **Manoj Kumar**, Debojyoti Chakraborty, "To understand the role of DNA topology in regulating LncRNAs implicated in neural development using cerebral organoids", Poster presentation at EMBO Workshop "Molecular neuroscience: From genes to circuits in health and disease" 04 – 07 February 2019 | Bangalore, India.
- **Manoj Kumar**, Arpita Konar, Souvik Maiti, Beena Pillai, Debojyoti Chakraborty, "Cerebral organoids for screening neuromodulators: a proof of concept study with small molecule", Poster presentation at India | EMBO Symposium "From synapses to memory: RNA based regulatory mechanisms" 15 – 18 October 2018 | Manesar, India.
- India | EMBO Symposium, "Big data in biomedicine" 25 – 27 February 2018 | Delhi, India.
- First National Conference on 'Recent Trends in Cell & Molecular Biology', organized by the Department of Life Sciences, Shiv Nadar University from 27th - 28th October, 2017 | Delhi, India.

TECHNOLOGY COMMERCIALIZED

- Member of the team at CSIR-IGIB, which developed a cost-beneficial, CRISPR-Cas9 based, point-of-care diagnosis assay for COVID-19, **FELUDA** (FnCas9 Editor Linked Uniform Detection Assay), which is commercially available as **TataMD CHECK**.

AWARDS AND FELLOWSHIPS

- CSIR Technology Award for Life sciences 2021**, presented to CSIR-IGIB for the, “Development of FnCas9 Editor Linked Uniform Detection Assay (FELUDA) for COVID-19 diagnosis”.
- EMBO Travel Award**; EMBO Workshop “Molecular neuroscience: From genes to circuits in health and disease”, 04 – 07 February 2019 | Bangalore, India
- Newton-Bhabha PhD Placement Grant 2018-19**, funded by Department of Biotechnology (DBT) and British Council. For a period of 4 months at “**The Francis Crick Institute**”, London, UK.
- Awarded **Senior Research Fellowship** under **AcSIR** PhD program from 2018-2021, by UGC
- Awarded **Junior Research Fellowship** under **AcSIR** PhD program from 2016-2018, by UGC
- First prize in idea Presentation at National Science Day, organized by University of Delhi and Indian National Science Academy (INSA), 2016.
- Cleared CSIR-UGC **National eligibility Test** (NET-JRF), 2015.
- Selected for **Gyanodaya III (2013)**, an annual educational trip organized by University of Delhi based on a proposed project, “Water pollution due to industrialization in modern cities of India and studied about different bacteria, which can be used to reduce water toxicity by bioremediation”.

INVITED TALKS

- “FnCas9 based low-cost CRISPR diagnostics for rapid detection of SARS-CoV2 and its major variants”, at CSIR-Institute of Genomics and Integrative Biology (19th Sept. 2021)
- “CoViD19: Accosting pandemic using CRISPR scissors”, at Shaheed Rajguru College of Applied Sciences for Women, University of Delhi (27th Oct. 2020).
- Development of FELUDA and its adaptation for CoViD-19 testing, at Bhaskaracharya College of Applied Sciences, University of Delhi (13th Jul. 2020).

NON-ACADEMIC ACTIVITIES

- Member of organizing committee for **CRISPR-Cas9 workshop** organized at CSIR-IGIB in the year 2017, 2018 and 2019 (covered by **The Week - Health and Nature India**)
 - Member of organizing committee of “1st International Conference on Empowerment of Women in Developing World’ February 06 - February 08, 2013, WDC, Shivaji College, University of Delhi.
 - Represented College Basketball team twice in intra-university sports meet (University of Delhi).
 - National level handball player for Central School (KVS)
 - Selected for Bangalore Regional level sports meet Basketball (KVS)
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