

Translational Molecular Medicine Lab

Prof Jayanth Kumar
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EDUCATION

MBBS (2000-2006), Government Stanley Medical College, Chennai, Tamil Nadu

MD, Biochemistry (2007-2010), AIIMS, New Delhi.

PROFESSIONAL EXPERIENCE

Senior Demonstrator (2010-2012)
Department of Biochemistry, AIIMS, New Delhi

Postdoctoral Research Fellowship (2012-2014)
Department of Pathology and Lab Medicine
David Geffen School of Medicine at UCLA, Los Angeles, California

Assistant Professor (2014-2017)
Associate Professor (2017-2020)
Additional Professor (2020-2024)
Professor (2024-Present)
Department of Biochemistry, AIIMS, New Delhi

Research Focus of the Lab

a. **RNA binding proteins and Epitranscriptomics:** The focus of our lab is in understanding the role of RNA binding proteins and RNA methylation in the pathogenesis of B-cell acute lymphoblastic leukemia/lymphoma (ALL). RNA binding proteins (RBPs) regulate gene expression post-transcriptionally. Our studies have identified the IGF2BP family of RBPs to be highly expressed in B-ALL. Our work has also identified that the percentage of methylated RNAs (m6A) is very high in B-ALL. We are attempting to decipher how these RBPs are overexpressed in B-ALL and what their role is in the pathogenesis of the disease in conjunction with RNA methylation.

b. **Gene Therapy:** Our lab also works on devising gene therapies for inborn errors of metabolism using CRISPR based viral vectors. At present, we are working on Gaucher's disease as a model for the same.

c. **Rare disease characterization:** Our lab is also part of a team at AIIMS which helps in molecular characterization of rare diseases in pediatrics. Novel mutations are analyzed and their functional role established using various molecular biology techniques.

Our Team

1. **Project Scientists**

a. **Dr Ramani Shyam:** Ramani is an ANRF National Postdoctoral Fellow. She is working on using CRISPR screens to rapidly identify therapeutic vulnerabilities in B-ALL.

b. **Dr Sumedha Saluja:** Sumedha is an ICMR project scientist-II. She is currently investigating the role of the epitranscriptome and the IGF2BP family of RNA-Binding Proteins in B-cell Acute Lymphoblastic Leukemia. She has a Masters in Biochemistry as well as PhD from AIIMS.

c. **Ishu Bansal**: Ishu is an ICMR Project Scientist-II who joined the lab in May 2021. She is investigating the role of the IGF2BP family of RNA-binding proteins in modulating the PI3K pathway in B-cell Acute Lymphoblastic Leukemia. She has submitted her PhD thesis and is awaiting her defence.

d. **Dr Christine Wilson:** Christine is an ICMR Project Scientist-I who is working on developing CAR-T cells in breast cancer

2. **Graduate Students**

a. **Ruchi Bhardwaj**: Ruchi is a fourth year PhD student and a DBT-SRF. She joined the lab as a graduate student in March 2023 and works on identifying gene networks perturbed by m6A modifications in B-ALL. She also did a Master's in Biochemistry (2019-2021) from our lab and worked on investigating the synergistic role of IGF2BP1/3 and METTL14 in leukemogenesis.

b. **Tanu Bansal**: Tanu is a fourth year PhD student and a DBT-SRF. She joined the lab as a graduate student in March 2023. She works on designing synthetic circuits to target B-ALL.

c. **Tejaswini Choudhury:** Tejaswini is a second year PhD student and an ICMR Project Scientist-I. She is working on creating synthetic circuits to identify soluble antigens and target them in B-ALL.

d. **Dr Reddipalli Sharath:** Dr Sharath is a senior resident who joined the lab in February 2021. He worked on deciphering the synergism between epitranscriptomic modifications and IGF2BPs in the stability of mRNAs. He is also a second-year PhD student and is working on developing and optimizing CRISPR-directed AAV-based therapies for Gaucher's disease.

3. **Lab technicians:** Pappu Prasad and Tanisha are lab technicians who help in patient sample collection, processing, and data collation as well as in various other roles in the lab.

Alumni

1. **Dr. Elza Boby**: Elza was a Junior resident in the Biochemistry Department (2015-2018). For her dissertation in our lab, she worked on the Role of IGF2BP1 in ETV6-RUNX1 translocation positive B-ALL. She now works as an Assistant Professor at Kasaragod Medical College in the Department of Biochemistry.

2. **Dr Sanjeev Goswami:** Sanjeev worked on the 'Role of IGF2BP3 in the invasion and migration of cancer cells' during his Masters in Biochemistry (2016-2018) in our lab. He is working as a Scientist in the Department of Pharmacology, AIIMS, New Delhi.

3. **Dr Thakur Nidhi:** Nidhi was a Junior Resident in the Biochemistry Department (2016-2019). For her dissertation, she worked on the Role of EGFL7 in ETV6-RUNX1 translocation positive B-ALL. She is presently a faculty at TMH, Varanasi.

4. **Harsh Bhakhri:** Harsh worked on 'The role of METTL3 and IGF2BP synergism in leukemogenesis' during his Masters in Biochemistry (2019-2021) in our lab. He is presently enrolled as a PhD student in Prof Kalpana Luthra's lab in Biochemistry at AIIMS, New Delhi.

5. **Dr Gunjan Sharma:** Gunjan was the first PhD student from the lab. She worked on elucidating the role of IGF2BP1 in ETV6-RUNX1 translocation-positive pediatric patients. She was a DBT-JRF/SRF and a winner of the SERB overseas visiting doctoral fellowship. She is presently an Alexander von Humboldt Postdoctoral Fellow at Dusseldorf University.

6. **Hemant Kumar:** Hemant was a Masters student in the lab. He did his dissertation on the role of circRNAs in hypoxia. He is currently a PhD student at PGIMER, Chandigarh.

7. **Diya Chawla:** Diya was a Master's student in the lab. Her dissertation involved the development of a monocyte-derived macrophage model for Gaucher's disease.

8. **Nisha Kushwaha**: Nisha was a Masters student in the lab. She worked on validating the expression of relapse-specific genes in a large cohort of archival patient samples.

9. **Saumya Kumari:** Saumya was a Masters student and her dissertation involved using a Cytosine DNA Base Editing approach to correct the L483P mutation in Gaucher disease and compare efficiency with CRISPR-directed RNA editing. She is currently a PhD student at BARC, Mumbai.

10. **Dr Kriti Kaushik:** Kriti joined the lab as a DBT-Research Associate (fellowship) in 2018 and worked on deciphering the role of long non-coding RNAs in regulating IGF2BP3 in aggressive cancers. She then became a DHR Young Scientist to study another class of non-coding RNAs i.e. circular RNAs bound with IGF2BP3 and their mechanism of action in promoting metastasis during hypoxia in leukemia patients. She is currently working in Invitrogen Life Sciences.

11. **Anjli Gaur** was a DHR project associate who working on identifying the role of relapse-specific genes in B-ALL. She is currently a PhD student in the Department of Laboratory Medicine at AIIMS, New Delhi.

12. **Mahek Farhan** was a DHR Project Associate working on a gene editing approach to correct Gaucher's disease. She also completed her Masters from our lab (2022-2024) and worked on designing an RNA-targeted CRISPR-based strategy to reverse the phenotype in Gaucher's disease. She is currently employed as an SRF with Prof Kunzang Chosdol at AIIMS, New Delhi.

13. **Mohammad Sabique Beg**: Sabique was a PhD student under Prof Parthaprasad Chattopadhyay who worked on using CRISPR-directed therapies to silence IGF2BP3 in cancer cell lines. He is currently employed as an ICMR Project Scientist-I in the Department of Medical Oncology, BRAIRCH, AIIMS, New Delhi.

14. **Dr Mahaiwon Shadang:** Mahaiwon was an ICMR Project Scientist-I who worked on developing various gene therapies for inborn errors. She is currently a Scientist at ICMR.

15. **Arjun Saraswat and Lajja Patel**: Arjun and Lajja were MBBS students selected by the institute's UG Mentorship Research Scheme. They worked on the role of IGF2BP3-associated circular RNAs in hypoxia and epithelial-to-mesenchymal transition.

Positions Available: We are always on the lookout for excellent postdoctoral/graduate students. If you are interested in the type of work which we do and have an idea which you wish to work on, please drop an email to *drjayanth@aiims.edu*. MBBS students for summer fellowships and short-term training are always welcome if you are willing to put in the hard work 😊. Visiting internships/observerships are closed as of now.

Key publications

1. *TUSC1 drives oxidative phosphorylation and inhibits tumor cell growth in colorectal cancer. Manhas J, Bhardwaj R, Tyagi S#, Kapuganti RS#, Bharadwaj A, Sharma J, Sharma G, Joshi D, Deo SVS, Parshad R, Das P, Singh A, Mathew S, Sen S*, **Palanichamy JK***. Apoptosis (2026) 31:130*
2. *Cep57 Organizes Pericentriolar Material Through Dual Architectural Modules and Prevents Human Mosaic Variegated Aneuploidy. Ahn J, Park J-E, Yun H-Y, Zeng Y, Kirsch K, Kumar V, Bartolome A, Ravishankar H, Bhardwaj R, Ghirlando R, Shadang M, Fazel M, Kim T-S, Ball D, Ku B, Kim SJ, Gupta N, **Palanichamy JK,** Karpova T, Lee KS. Nature Communications (2026) (Manuscript In Press) https://doi.org/10.1038/s41467-026-77795-4*
3. *Non-coding c.*6C>T variant in RBM8A associated with thrombocytopenia-absent radius (TAR) syndrome in three Indian patients. Langeh N, Sharath R, Ansari MT, **Palanichamy JK**, Gupta N. Clinical Genetics (2026) (Manuscript In Press)*
4. *Aberrant overexpression of m6A writer and reader genes in pediatric B-Cell Acute Lymphoblastic Leukemia (B-ALL). Saluja S, Ganguly S, Sharma G, Singh J, Jain A, Chaudhary S, Karthikeyan P, Chattopadhyay P, Chopra A, Singh A, Karmakar S, Bakhshi S, **Palanichamy JK**. Translational Oncology (2025) 56:102403*
5. *RNA binding protein IGF2BP1 synergizes with ETV6-RUNX1 to drive oncogenic signaling in B-cell Acute Lymphoblastic Leukemia. Sharma G, Tran TM, Bansal I, Beg MS, Bhardwaj R, Bassi J, Tan Y, Tso C, Jaiswal AK, Jain A, Singh J, Chattopadhyay P, Singh A, Chopra A, Bakhshi S, Casero D, Rao DS, **Palanichamy JK**. Journal of Experimental and Clinical Cancer Research (2023) 42:231*
6. *Distinct oncogenic phenotypes in hematopoietic specific deletions of Trp53. **Palanichamy JK**, Tran TM, King JK, Katzman S, Ritter AJ, Sharma G, Tso C, Contreras JR, Fernando TR, Sanford J, Rao DS. Scientific Reports (2023) 13: 7490*

7. *Mosaic variegated aneuploidy syndrome 2 with biallelic novel CEP57 splice site variation in Indian siblings: Expanding the clinical and molecular spectrum. Langeh N, Saluja S, Ethayathulla AS, Jana M, Shukla R,* ***Palanichamy JK*****, Gupta N*. Clinical Genetics (2023) 103(4): 478-483 (*Equal Authorship)*
8. *Diagnostic utility of IGF2BP1 and its targets in ETV6-RUNX1 positive B-cell Acute Lymphoblastic Leukemia. Sharma G, Boby E, Nidhi T, Jain A, Singh J, Singh A, Chattopadhyay P, Bakhshi S, Chopra A,* ***Palanichamy JK*.*** *Frontiers in Oncology (2021) 11:588101*
9. *The RNA binding protein IGF2BP3 is required for MLL-AF4 mediated leukemogenesis. Tran TM, Philipp J, Bassi J, Nibber N, Draper J, Lin T,* ***Palanichamy JK****, Kumar A, Paing M, King JK, Katzman S, Sanford JR, Rao DS. Leukemia (2021) 36(1):68-79*
10. *A patient with the POLA1 splice variant expands the yet evolving phenotype of Van Esch-O'Driscoll syndrome. Monika E, Saluja S, Ethayathulla AS, Sapra S, Dalal A,* ***Palanichamy JK*****, Gupta N*. European Journal of Medical Genetics (2021) 64(8):104261 (*Equal Authorship)*
11. *RNA-binding protein IGF2BP3 targeting of oncogenic transcripts promotes hematopoietic progenitor proliferation.* ***Palanichamy JK****, Tran TM, Howard JM, Contreras JR, Fernando TR, Sterne-Weiler T, Katzman S, Touloue M, Yan W, Basso G, Pigazzi M, Sanford JR, Rao DS. Journal of Clinical Investigation (2016)126(4): 1495-511*

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