Purva Vats, PhD
Genomic Scientist

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Research Scientist with 20+ years of work experience in microbiology, genomics, and molecular biology. Expertise in different molecular biology techniques and making NGS genomic and metagenomic libraries to sequence on various illumina and PacBio platforms. Published multiple scientific papers and awarded with university gold medals. Skilled in laboratory management including staff training, regulatory compliance, preparation of SOPs. Collaborative and able to coordinate with cross functional teams. Strong problem-solving skills, self-motivated, analytical thinker, and attentive to details.

EDUCATION

Ph.D.	Microbiology/ Biotechnology	2003	Institute of Microbial Technology (Jawaharlal Nehru University, New Delhi, India)
M.Sc.	Microbiology (Hons.)	1997	Panjab University, Chandigarh, India.
B.Sc.	Microbiology (Hons.)	1994	Panjab University, Chandigarh, India.

PROFESSIONAL EXPERIENCE

NOV 2023-PRESENT

Genomic Scientist, The Jackson Laboratory of Genomic Medicine, Farmington, Connecticut

- As part of Genome technologies core facility, I am involved in the coordination and management of diverse projects, leading the isolation of High Molecular Weight DNA from blood samples obtained from families with children born with rare diseases and making long-read libraries to sequencing on Revio platform.
- supports a broad range of sequencing-based projects and contributes to the development, validation, and implementation of new genomic workflow
- Contributing expertise to projects of clinical significance, specializing in the isolation of DNA from tissues and dried blood spots. Proficiently involved in the generation of Next-Generation Sequencing (NGS) libraries.

NOV 2020-NOV 2023

Associate Research Scientist, The Jackson Laboratory of Genomic Medicine, Farmington, Connecticut

- As Associate Research Scientist-CLIA R&D, involved in the development of assays of clinical significance and their transition to CLIA operations teams for validation and launch.
- Coordinate with other scientific teams and their projects that establish collaborations to enhance the research capabilities and impact of the CLIA R&D team.
- Develop and implement quality control measures for genomic and metagenomic library preparation and sequencing to ensure accurate and reliable data.

JUN 2014 - NOV 2020

Associate Research Scientist, The Jackson Laboratory of Genomic Medicine, Farmington, Connecticut

- Associate Research Scientist and Lab Supervisor of Microbial Genomics Core.
- Working in area of microbiome, preparing, and sequencing genomic and metagenomic libraries to understand

the role of microbes in regulating human health.
• Manage and oversee a team of laboratory personnel, providing guidance and support to ensure efficient and accurate completion of research projects.
• Train and mentor junior researchers in the use of genomic technologies and methodologies to support them in individual research projects.

SEP 2010 - MAY 2014

Research Associate Scientist-I, University of Connecticut Health Center, Farmington, Connecticut.

• Research Associate Scientist in the Dept. of Molecular Biology and Biophysics.
• Continued research to investigate and analyze bacterial cell division mechanisms, organization, and modelling of cytoskeletal elements

SEP 2004 - AUG 2010

Post-Doctoral Research Fellow, University of Connecticut Health Center, Farmington, Connecticut.

• Post-Doctoral Research Fellow in the lab of Prof. Lawrence Rothfield at UCHC.
• Conducted research in bacterial cell division and cytoskeletal elements.
• Trained and mentored summer students, research assistants and junior researchers in the lab SOPs, poster presentations, scientific paper and report writings.

JAN 2003 - MAY 2004

Post-Doctoral Research Fellow, Institute of Microbial Technology, Chandigarh, India

• Post-Doctoral Research Fellow in the lab of Dr. Anand K Bachhawat, Dept. of Molecular Biology and Yeast Genetics.
• Conducted research in the field of Yeast molecular biology, specifically focused on understanding the oxo-prolinase pathway in *Saccharomyces cerevisiae* and *S. pombe*.

MAR 2000 - JAN 2003

Senior Research Fellow, Institute of Microbial Technology, Chandigarh, India.

Worked on the catalytic and enzymatic properties of *myo*-ionistol hexkisphosphate phosphate degrading enzyme from a hyper-producing strain of *Aspergillus niger* van Teigham.

JUN 1998 - FEB 2000

Junior Research Fellow, Institute of Microbial Technology, Chandigarh, India.

Isolated a novel hyper-producer strain of *Aspergillus niger*, did the chemical & catalytic characterization of enzyme.

TECHNICAL EXPERTISE

- Extracting high molecular weight and high-quality DNA from variety of human and mouse samples for making NGS libraries associated with various genomic, transcriptomic, and epigenetic analyses projects.
- Extensive experience in preparing 16S (v1-v3), Full length 16S, ITS, mWGS, WGS, whole exome, target panels, RNASeq, Iso-Seq, targeted RNASeq, and PacBio libraries (amplicon and shotgun) for sequencing on various platforms (MiSeq, NextSeq, NovaSeq, Sequel IIe, Revio).
- 15+ years of experience in molecular biology and sequencing techniques
    - Designing primers, devising, and carrying out strategies for doing DNA constructions.
    - Site directed and random mutagenesis of DNA, PCR, qPCR.
    - Gene disruptions in bacterial genome by linear DNA transformations.
    - Promoter-Repressor cloning.

- DNA sequencing and analysis using software besides other standard molecular procedures.

- Fluorescence microscopy of bacterial cells:

  Immunofluorescence (single & double label), Epifluorescence, Phase contrast microscopy, Single molecule fluorescence microscopy, PALM, FRAP.

- Bacterial genetic techniques:

  Transduction, Transformation, and Bacterial genetic mapping.

- Protein characterization (both biochemical and catalytic), protein purification (affinity, size exclusion), western blotting, Immunoblotting.

WORK RESPONSIBILITIES

- Supports a broad range of sequencing-based projects and contributes to the development, validation, and implementation of new genomic workflows.
- Coordinate with cross-functional teams via organization and prioritization of tasks to ensure timely completion of assay development projects.
- Contribute to the creation and implementation of standard operating procedures (SOPs) for assay development and testing to ensure consistency and accuracy in the laboratory operations.
- Collaborate with the CLIA operations team to optimize the workflow for the development and validation of clinical assays, ensuring efficient and accurate results.
- Conduct regular audits of laboratory processes and procedures to ensure compliance with regulatory standards and best practices.
- Responsible for training new laboratory staff and research assistants on assays and protocols for clinical testing to ensure quality and consistency in operations.
- Contribute to the preparation of scientific reports and presentations for internal and external audiences. Presented research findings at conferences and seminars.
- Published research articles in peer-reviewed scientific journals.

BRIEF OUTLINE OF ACCOMPLISHMENTS

1) As a Research Scientist

- Own a patent and,
- Authored multiple peer reviewed scientific publications.
  - PNAS (Proceedings of National Academy of Sciences USA) publication was selected by Faculty of 1000 Biology that comprehensively and systematically highlights and reviews the most interesting papers published in the biological sciences, based on the recommendations of a faculty of well over 2300 selected leading researchers.

- Work on the specialized imaging of the cytoskeletal elements in microscopic bacteria was selected on the **cover page** of Molecular Microbiology journal.
- Selected by "**Marquis-Who's Who in America**" for my research work.

- From 2007- 2012, I served in expert review panel of various scientific journals:
  - IJMS journal (International Journal of Molecular Sciences),
  - Biotechnology Progress journal (ACS: American Chemical Society publications),
  - CREST journal (Critical Reviews of Environmental Science Technology),
  - Journal of Chromatography A (Elsevier publications),
  - Regulatory Toxicology and Pharmacology (Elsevier publications).
  - Additionally, served as editor for a volume on "The Bacterial Cytoskeleton" in Methods in Molecular biology-series published by John & Jan Wallace, UK.
- Designed and developed a **promoter methylation assay** to predict the efficacy of neo-adjuvant therapies in patients with glioblastoma and breast cancer. The assay underwent clinical validation by CLIA (Clinical Laboratory Improvement Amendments) operations teams and successfully launched as propriety assay by the Jackson Labs to help oncologists select the best treatment options for each patient.

2) Accomplishments during Grad and Under-Grad years.

- Awarded with **5 University Gold Medals** for scoring highest among all students in Master of Sciences (Honors) Microbiology and Bachelor of Sciences (Honors) Microbiology program at Panjab University, Chandigarh, India.
- Awarded with **National Young Scientist award.**
- Awarded **Senior Research Fellowship** and **National Junior Research Fellowship** from the Council of Scientific and Industrial Research (premium funding agency), Government of India.

PUBLICATIONS/PATENTS

PATENT: Purva Vats and U.C. Banerjee. A process for the production of extracellular phytase using novel isolate of Aspergillus niger var teigham. Patent No.: 197539 granted on 22/09/2006.

PUBLICATIONS: First author: 14/21; Co-author: 8/21
*Corresponding author: 4/21
Journal Cover page Illustration: 1

List of publications:

1. Elizabeth A. Werren, Louisa Kalsner, Jessica Ewald, Michael Peracchio, Cameron King, **Purva Vats**, Peter A. Audano, Peter N. Robinson, Mark D. Adams, Melissa A. Kelly, Adam P. Matson. Phenotypic Expansion of Knobloch Syndrome Type 2 in an Individual With a De Novo PAK2 Variant. (2025). American Journal of Medical Genetics Part A, Vol 197 (6). PMID: 39876536, PMCID: PMC12052494
2. Elizabeth A. Werren, Louisa Kalsner, Jessica Ewald, Michael Peracchio, Cameron King, **Purva Vats**, Peter A. Audano, Peter N. Robinson, Mark D. Adams, Melissa A. Kelly, Adam P. Matson. A de novo variant in PAK2 detected in an individual with Knobloch type 2 syndrome. (2024). bioRxiv. PMID: 38712026, PMCID: PMC11071314
3. Candice N Baker, Debra Duso, Nagarama Kothapalli, Tricia Hart, Sean Casey, Tres Cookenham, Larry Kummer, Janine Hvizdos, Kathleen Lanzer, **Purva Vats**, Priya Shanbhag, Isaac Bell, Mike Tighe, Kelsey Travis, Frank Szaba, Olivia Bedard, Natalie Oberding, Jerrold M Ward, Mark D Adams, Cathleen Lutz, Shelton S Bradrick, William W Reiley, Nadia Rosenthal. (2024). Characterization of Collaborative Cross mouse founder strain CAST/EiJ as a novel model for lethal COVID-19. Scientific Reports**.** 14 (1) :25147. PMID: 39448712
4. Laura J. Rojas, George M. Weinstock, Elsa De La Cadena, Lorena Diaz, Rafael Rios, Blake M. Hanson, Joseph S. Brown, **Purva Vats**, Daniel S. Phillips, Hoan Nguyen, Kristine M. Hujer, Adriana Correa, Mark D. Adams, Federico Perez, Erica Sodergren, Apurva Narechania, Paul J. Planet, Maria V. Villegas, Robert. A. Bonomo, Cesar A. Arias. An Analysis of the Epidemic of KPC-Producing Klebsiella pneumoniae: Convergence of Two Evolutionary Mechanisms Creates the "Perfect Storm''. The Journal of Infectious Diseases, Volume 217 (1): 82–92. PMID: 29029188. PMCID: PMC5853647
5. *__Purva Vats__, Ji Yu and Lawrence Rothfield. (2009). The dynamic nature of the bacterial cytoskeleton. Cellular and Molecular Life Sciences. Vol. 66 (20): 3353-3362. PMID: 19641848.

6. * ⚕ **Purva Vats**, Yu-Ling Shih and Lawrence Rothfield. (2009). Assembly of the MreB-associated cytoskeletal ring of *E.coli*. Molecular Microbiology. Vol. 72 (1): 170-182. PMID: 19220747.
7. **Purva Vats**, Bharat Bhushan and U.C. Banerjee. (2009). Studies on the dephosphorylation of phytic acid in livestock feed using phytase from Aspergillus niger van Teighem. Bioresource Technology. Vol. 100 (1): 287-291. PMID: 18650085
8. **Purva Vats**, Bharat Bhushan, Asit K Chakarborti and U.C. Banerjee. (2008). Separation and identification of enzymatically prepared dephosphorylated products of myo-

inositolhexakisphosphate using LC-MS. Journal of Separation Science. Vol. 31 (22): 3829-3833. PMID: 19009537.

9. **Purva Vats** and Lawrence Rothfield. (2007). Duplication and segregation of the actin (MreB) cytoskeleton during the prokaryotic cell cycle. Proceedings of National Academy of Sciences, USA (PNAS). Vol. 104 (45): 17795-17800. PMID: 17978175.
10. **Purva Vats** and U.C. Banerjee. (2006). Catalytic characterization of phytase (myo-inositolhexakisphosphate phosphohydrolase) from Aspergillus niger van Teighem: Glycosylation pattern, kinetics and molecular properties. Enzyme and Microbial Technology. Vol. 39: 596-600.
11. **Purva Vats**, M.S. Bhattacharyya, and U.C. Banerjee. (2005). Uses of Phytases (myo-inositol-hexakisphosphate phosphohydrolase) for combating phosphorus pollution: A biological approach. Critical Reviews in Environmental Science and Technology. Vol. 35 (5): 469-486.
12. **Purva Vats** and U.C. Banerjee. (2005). Biochemical characterization of extracellular phytase (myo-inositol hexakisphosphate phosphohydrolase) from a hyper-producing strain of Aspergillus niger van Teighem. J Industrial Microbiology and Biotechnology. Vol. 32 (4): 141-147. PMID: 15776271.
13. Srikanth CV, **Purva Vats**, Andrea Bourbouloux, Serge Delrot, Anand K Bachhawat. (2005). Multiple cis- regulatory elements and the yeast sulphur regulatory network are required for the regulation of the yeast glutathione transporter, Hgt1p. Current Genetics. Vol. 47(6): 345-58. PMID: 15821937.
14. Lawerence Rothfield, Aziz Taghbalout and **Purva Vats**. (2005). Bacterial cells have cytoskeletons, Too. ASM News. Vol. 71(12): 582-586.
15. Harpreet Rai, M.S. Bhattacharyya, J. Singh, T.K. Bansal, **Purva Vats** and U.C. Banerjee. (2005). Removal of Dyes from the effluent of textile and dyestuff manufacturing industry: A review of emerging techniques with reference to biological treatment. Critical Reviews in Environmental Science and Technology. Vol. 35 (3): 219-238.
16. **Purva Vats**, D.K. Sahoo and U.C. Banerjee. (2004). Studies on the production of phytase (myo-inositolhexakisphosphate phosphohydrolase) by Aspergillus niger van Teighem in laboratory scale fermenter. Biotechnology Progress. Vol. 20 (3): 737-743. PMID: 15176876.
17. **Purva Vats** and U.C. Banerjee. (2004). Production studies and catalytic properties of phytases (myo-inositolhexakisphosphate phosphohydrolases): An Overview. Enzyme and Microbial Technology. Vol. 35: 3-14.
18. Ganguly D, Srikanth CV, Kumar C, **Vats P**, Bachhawat AK. (2003). Why is glutathione (a tripeptide) synthesized by specific enzymes while TSH releasing hormone (TRH or thyroliberin), also a tripeptide, is produced as part of a prohormone protein? IUBMB Life. Vol. 55 (9): 553-554. PMID: 14658762.

19. **Purva Vats** and U.C. Banerjee. (2003). Release of intracellular β-galactosidase of Bacillus polymyxa using high pressure homogenization in French Press. IIChe. Vol. 38 (1): 43-45.
20. **Purva Vats** and U.C. Banerjee. (2002). Studies on the production of phytase by a newly isolated sp. of Aspergillus niger van Teighem obtained from rotten wood-logs. Process Biochemistry. Vol. 38: 211-217.
21. **Purva**, S.K. Soni, L.K. Gupta, J.K. Gupta. (1998). Thermostable alkaline protease from alkalophilic Bacillus sp. IS-3. Ind. J. Microbiol. Vol. 38: 149-152.

CONFERENCES/MEETINGS/WORKSHOPS

- Presented work on "FtsZ mutagenesis and its role in bacterial morphogenesis", at Molecular Biology and Biophysics 2013 Retreat held on Nov 15th-16th 2013 at Interlaken Resort, Salisbury, Connecticut, USA.
- Oral presentation on, " The role of FtsZ in *E. coli* morphogenesis: saturation mutagenesis of FtsZ surface residues" in European Molecular Biology Organization (EMBO) workshop on Reconstructing the essential bacterial cell cycle machinery held from Sep 16th-18th 2012 at Real Sitio de San Ildefonso (Segovia), Spain.
- Poster presentation on "The prokaryotic actin (MreB) ring is a multiprotein structure involved in cytoskeletal segregation". Purva Vats and Lawrence Rothfield, in Gordon Research Conference on Bacterial Cell Surfaces held from June 22-27, 2008, at Colby-Sawyer College in New London, New Hampshire, USA.
- Poster presentation on "Division and segregation of *E. coli* actin (MreB)-associated cytoskeleton involves a multiprotein ring structure". Purva Vats and Lawrence Rothfield, in 108th American society of Microbiology-General Meeting held from June 1-5, 2008 at new Boston Convention and Exhibition Center, Boston, Massachusetts, USA.
- Oral presentation on, "Prokaroytic actin associated cytoskeletal ring: a multiprotein structure" in Molecular, Microbial and Structural Biology 2008 Retreat held on Apr 29th 2008 at University of Hartford, Hartford, Connecticut, USA.
- Oral presentation on "Duplication and segregation of prokaryotic actin (MreB) cytoskeleton during the division cycle" in Boston Bacterial Meeting 2007 held on June 21-22, 2007 at Tufts University School of Medicine, Boston, Massachusetts, USA.
- Poster presentation on "Duplication and partition of the prokaryotic actin cytoskeleton during the division cycle". Purva Vats and Lawrence Rothfield, in Molecular, Microbial and Structural Biology 2007 Retreat held on Apr 10th 2007 at Garmin Hall, Farmington, Connecticut, USA.
- Oral presentation on, "Cellular dynamics of MreB: an actin like cytoskeletal protein in bacteria" in Molecular, Microbial and Structural Biology 2006 Retreat held on Mar 16th, 2006, at Storrs Campus, Connecticut, USA.

- Participated in Yeast 2003: An international meeting on yeast biology held on Feb 20-22nd 2003 at Institute of Microbial Technology, Chandigarh, INDIA.
- Poster presentation on "Biochemical characterization and application of myo-inositol hexakis phosphate degrading enzyme from Aspergillus niger van Teighem". Purva Vats, D.K. Sahoo, U.C. Banerjee, in an International Conference on Emerging Frontiers at the interface of Chemistry and Biology, held on Apr 28th -30th 2003 at Trivandrum, INDIA.

AWARDS/ ACHIEVEMENTS/ SCHOLARSHIPS

2009	Selection of "*E.coli* cytoskeleton micrograph" on the cover page of Molecular Microbiology journal.
2007	Selection of research article on, "Duplication and segregation of the actin (MreB) cytoskeleton during the prokaryotic cell cycle" published in PNAS, USA by Faculty of 1000 Biology that comprehensively and systematically highlights and reviews the most interesting papers published in the biological sciences, based on the recommendations of a faculty of well over 2300 selected leading researchers.
2000-2003	Awarded National Senior Research Fellowship by the Council of Scientific and Industrial Research (premium funding agency), Government of India.
1998-2000	Awarded National Junior Research Fellowship by the Council of Scientific and Industrial Research, Government of India.
Dec 1998	Qualified National Eligibility Test conducted jointly by the Council of Scientific and Industrial Research (CSIR) and University Grants Commission (UGC), New Delhi to screen Junior Research Fellows for Ph.D. program and eligibility for lectureship in Government colleges and universities.
1997	Awarded with University Gold Medal as topper of the class in Master of Sciences (Honors) Microbiology, Panjab University, Chandigarh, India.
1994	Awarded with University Gold Medal as topper of the class in Bachelor of Sciences (Honors) Microbiology, Panjab University, Chandigarh, India.
1992-1997	Awarded National Scholarship during bachelor's and Masters (Honors) from Government of India.