Curriculum vitae

HEMANT KUMAR

Correspondence Address:

Ramalingaswami Fellow,

Molecular Biology Unit,

IMS, BHU, Varanasi, UP, 221005

Email : ptk.hemant@gmail.com

Mob: +918178967148

+919120603548

EDUCATION

Ph.D. : Life Sciences (2011)
Jawaharlal Nehru Univeristy, New Delhi, India
Supervisor: Prof. Atul Kumar Johri
Thesis Title : Expression, Purification and biochemical Characterization of High affinity phosphate transporter from *Piriformospora indica (P. indica).*

M.Sc.: Biotechnology (2002)
School of Biotechnology, Devi Ahilya Vishwavidhyalaya (DAVV), Indore, (M.P.), India.

B.Sc. : Biology (Botany, Zoology, Chemistry) (1998)
Pt. Ravishanker Shukla University, Raipur (CG), India

- **NCC "C" certificate with "B" Grade.**

Professional Experience:

28 Dec 2018 - to Date: **Ramalingaswami Fellow**, Molecular Biology Unit, IMS, BHU, Varanasi, UP, India.

7 Sep 2018 - 27 Dec 2018: **Ramalingaswami Fellow**, Microbiology Department, AIIMS, Raipur, Raipur, Chattisgarh, India.

1Sep 2017- 31 Aug 2018: **Associate Specialist,** University of California San Francisco, CA, USA.

Sep 2011- 31 Aug2017: **Postdoctoral Scholar**, University of California San Francisco, CA, USA.

Other Research Experience:

Feb 2011-Sep 2011: School of Life Sciences, Jawaharlal Nehru University, New Delhi,.

- Sep2002 –May 2003 Department Of Zoology, Banaras Hindu University. Five months of research experience at Dept. of Zoology, Banaras Hindu University, Varanasi (UP), India, on a DST project Titled "Isolation, Purification and Characterization of Carbamoyl Phosphate Synthetase from a teleost fish".

- 69 days training on "gel chromatographic studies on Xylanases" at Birla Institute of Scientific Research (BISR), Jaipur, India.
- 6 Months research project on "RAPD Analysis of Soybean Varites"at School of Biotechnology, Devi Ahilya University, Indore (M.P.), India, during fourth Semester of M.Sc. course.

Teaching experience:

July 2003- July 2004 Lecturer at Sai institute of information and educational Technology, Bhilai, Chattisgarh

Papers published in Peer reviewed Journals:

1. Nancy Tripathi , Bharat Goel , Nivedita Bhardwaj , Bharat Sahu , **Hemant Kumar** & Shreyans K. Jain **(2020)**: Virtual screening and molecular simulation study of natural products database for lead identification of novel coronavirus main protease inhibitors, Journal of Biomolecular Structure and Dynamics, DOI: 10.1080/07391102.2020.1848630. **Impact factor 3.22, Peer reviewed Journal, Citations: None. ISSN No 07391102.**

2. Kumar H, Janet Finer-Moore', Irina Smirnova, Vladimir Kasho, Els Pardon, Jan Steyaert, H. Ronald Kaback and Robert M. Stroud **(2020),** Diversity in kinetics correlated with structure in nano body-stabilized LacY, PLoS ONE 15(5): e0232846. https://doi.org/10.1371/journal.pone.0232846 **. Impact factor 2.77, Peer reviewed Journal, Citations: None. ISSN No 1932-6203**

3. Kumar H, Janet S. Finer-Moore, Xiaoxu Jiang, Irina Smirnova, Vladimir Kasho, Els Pardon, Jan Steyaert, H. Ronald Kaback and Robert M Stroud **(2018),** Crystal Structure of a ligand bound LacY/Nanobody Complex. **Proceedings of National Academy of Science, USA.** Vol. 115(35):8769-8774. **Impact factor 9.7, Peer reviewed Journal, Citations: 11. ISSN No 0027-8424**

4. Kumar H, Moore JSF, Kaback HR, Stroud RM **(2015),** Structure of LacY with an α substituted galactoside: connecting the sugar-binding site to the protonation site. **Proceedings of National Academy of Science, USA.** Vol. 112 (29): 9004–9009. **Impact factor 9.7, Peer reviewed Journal, Citations: 33. ISSN No 0027-8424**

5. Kumar H, Vladimir K, Smirnova I, Moore JSF, Kaback HR and Stroud RM **(2014),** Structure of Sugar-Bound LacY. **Proceedings of National Academy of Science, USA,** Vol. 111 (5), 1784–1788. **Impact factor 9.7, Peer reviewed Journal, Citations: 94. ISSN No 0027-8424**

6. Pedersen,BP, **Kumar,H**., Waight,AB, Risenmay,AJ, Zygy Roe-Zurz, Chau, BH Schlessinger, A., Bonomi, M., Harries, W., Sali, A., Johri, AK, Stroud, RM **(2013),** Crystal structure of a eukaryotic phosphate transporter. **Nature, 496 (7446):533-536**. **Impact factor 41.4, Peer reviewed Journal, Citations: 180. ISSN 0028-0836**

7. Sharma,P., Lata, H., Arya, DK., Kashyap,AK., **Kumar,H.,** Dua, M., Ali,A., and Johri, AK **(2013),** Role of pilus proteins in adherence and invasion of Streptococcus agalactiae to the lung and cervical epithelial cells. **Journal of Biological Chemistry, 288(6):4023-34. Impact factor 4.6, Peer reviewed Journal, Citations: 32. ISSN 0021-9258**

8. Kumar, M, Yadav, V, **Kumar, H.,** Sharma, R, Singh A, Tuteja N, Johri, A.K. **(2011),** *Piriformospora indica* enhances plant growth by transferring phosphate. **Plant Signal Behavior. 6(5):723-725. Impact factor 2.0, Peer reviewed Journal, Citations: 57. ISSN 15592316**

9. Yadav, V., Kumar, M., Kumar, D.D., **Kumar, H.,** Tripathi, T., Sharma, R., Tuteja, N., Saxena A.K. and Johri A.K. **(2010),** A Phosphate Transporter from Axenically Cultivable Arbascular Mycorrhiza like Fungus *Piriformospora indica* and its Role in the Phosphate Transfer to the Plants**. Journal of Biological Chemistry. 285 (34): 26532-26544. Impact factor 4.6, Peer reviewed Journal, Citations: 241. ISSN 0021-9258**

Citations Google scholar link: https://scholar.google.com/citations?user=MqubauYAAAAJ&hl=en

Protocol Published on Nature protocol Site:
Manoj Kumar, Hemant Kumar, Narendra Tuteja, Meenakshi Dua and Atul Kumar Johri, (2010): Development of electroporation-mediated transformation system for axenically cultivable root endophyte fungus *Piriformospora indica.* Nature Protocol Exchange.
http://www.natureprotocols.com/2010/07/22/development_of_electroporation.php

Publication under preparation:

1. Structure of outward occluded apo confirmation of Eukaryotic high affinity phosphate transporter . **Hemant Kumar**, Robert M Stroud and Atul Kumar Johri in **Nature Structural and Molecular Biology**
2. Biochemical characterization of PiPT, a High affinity phosphate transporter from *P. Indica.* **Hemant Kumar**, William Harries, Zygy Roe zurz, Samantha Ngaw, Atul K Johri, Robert Stroud **For Biophysical Journal**

INVITED TALKS:

1. Invited for Talk in 56th annual conference of association of microbiologist of India, Jawaharlal Nehru University, New Delhi, India, Dec 7-10, 2015.
2. JNU, Major facilitator Superfamily : Biophysics to Biochemistry , 10 April 2015.
3. IIT Kanpur, Major facilitator Superfamily : Biophysics to Biochemistry , 7 Jan 2015.
4. RCB, Major facilitator Superfamily : Biophysics to Biochemistry , 11 Dec 2015.
5. IIT, Indore, Major facilitator Superfamily : Biophysics to Biochemistry , 18 Dec 2015.
6. Kalyan collage, Bhilai Chattisgarh, Membrane proteins : small molecules transporters, 9 April 2015.

AWARDS AND SCHOLARSHIP:

- Awarded Junior Research Fellow, Indian Council Of Medical Research (ICMR JRF) in 2004.
- Awarded Junior Research Fellow, Council of Scientific and Industrial Research, (CSIR JRF) in June 2004 as well as Lecturer ship in 2001 and 2002.
- Qualified GATE- 2002 (Graduate Aptitude Test for Engineering conducted by Indian Institute of Science, Bangalore, India) in Life Sciences with 96.39 percentile and 95th all India rank.
- Selected in All India Combined Biotechnology Entrance Examination (CEEB)-2000 conducted by Jawaharlal Nehru University (JNU), New Delhi on behalf of various participating universities & chose to join Devi Ahilya Vishwavidyalaya, Indore (M.P.).

- Received monthly Scholarship by Department of Biotechnology (DBT, Ministry of Science & Technology, Govt. of India), during M.Sc. Biotechnology.
- Junior Research Fellow, Department of Science and Technology (DST JRF) in 2003 at BHU under the project "Isolation, Purification and Characterization of Carbamoyl Phosphate Synthetase from a teleost fish".
- Awarded with Wood Whelan fellowship (July 2009 to September2009) for study visit to Stroud Lab, UCSF, San Francisco, USA.
- Awarded Travel grant in July 2009 from JNU, New Delhi to join Stroud Lab at UCSF for research work.
- Appointed as Jr. Specialist at Stroud Lab, MPEC, UCSF, USA during July 2009 to January 2010 for research work on PiPT.
- Awarded Travel grant from DST, India to attend A workshop on "Structural Molecular Biology, Low Z XAS summer school" at Stanford Synchrotron Radiation Lightsource, at Stanford University, USA held on July 20-23,2010.
- Appointed as Jr. Specialist at Stroud Lab, MPEC, UCSF, USA during July 2010 to January 2011 for research work on PiPT.
- Awarded 1st prize for Oral presentation at **56th annual conference of association of microbiologist of India, Jawaharlal Nehru University, New Delhi, India, Dec 7-10, 2015.**
- **Awarded Ramalingaswami fellowship 2017.**

Attended /Paper presented in Seminar/ Symposium/Workshop:

Attended National

1. November13-15, 2000, ***"Workshop on Bioinformatics In Biological Sciences"*** at School of Biotechnology, Devi Ahilya University, Indore (M.P.), sponsored by Department of Biotechnology, Govt. of India.
2. November8-10, 2001, ***"Workshop on Computers in Biological Sciences"*** at School of Biotechnology, Devi Ahilya University, Indore (M.P.), sponsored by Department of Biotechnology, Govt. of India.
3. January 11-12, 2002, ***" Workshop on Genomics and Proteomics"*** at School Biotechnology, Devi Ahilya University, Indore (M.P.), sponsored by Department of Biotechnology, Govt. of India.
4. Worked as active member of organizing committee of Satellite Symposium on "Advancing Nanotechnology and its Implications in Biological Sciences" December 14, 2007, School of Life Sciences, Jawaharlal Nehru University, New Delhi-110067, India.

Presented Poster National

1. Presented poster **"**Rosaceae family as a source of novel lectins," **Hemant Kumar**, Archana Sehgal, Rohini Muthuswami, Sneha Sudha Komath. at*"Conference on Recent developments in carbohydrate chemistry"* November26th – 29th, 2006,at Department of chemistry, Delhi University, Delhi, India sponsored by Association of Carbohydrate Chemists and Technologists of India (ACCTI).

2. Presented poster "Novel lectin activity from *Rosaceae."* **Hemant Kumar**, Archana Sehgal, Rohini Muthuswami, Sneha Sudha Komath at *"75th meeting of Society of Biological Chemist of India"* December8th – 11th, 2006, at School of Life Sciences, Jawaharlal Nehru University, New Delhi, India sponsored by Society of Biological Chemist of India.

3. Presented poster "Conserved glycine's in human Monocarboxylate transporters Family (MCT)" Kamal Kishore rajak**, Hemant Kumar *(Corresponding author)*** at National Conference on Frontiers in Health Sciences, IMS, Banaras Hindu University (BHU) on March 11, 2019.

International Attended:

1. Attended international conference on "Novel strategies for targeted prevention and treatment of cancer" held at School of Life Sciences, JNU, India on 19-20 December 2008.
2. Attended "**Structural Molecular Biology, Low Z XAS summer school**" at Stanford Synchrotron Radiation Lightsource, at Stanford University, USA held on July 20-23,2010.
3. Attended **Schrödinger's Molecular Modeling and Drug Discovery Workshop** "*Virtual Screening with Glide"* August 13, 2014, UCSF, Mission Bay Campus, San Francisco CA, USA.

International Poster Presented:

1. Presented poster *Piriformospora indica* phosphate transporter (PiPT) expression purification and functional characterization , **Hemant Kumar**, William Harries, Zygy Roe zurz, Samantha Ngaw, Atul K Johri, Robert Stroud, at "The 4th Membrane Protein Technologies Meeting" San Francisco, CA, USA Nov. 28-30, 2012, Hosted by Membrane protein Expression Center (MPEC), UCSF, Mission Bay, San Francisco, CA, USA, 94158.
2. Presented poster *Piriformospora indica* phosphate transporter (PiPT) expression purification and functional characterization , **Hemant Kumar**, William Harries, Zygy Roe zurz, Samantha Ngaw, Atul K Johri, Robert Stroud, at Annual Roadmap meeting Membrane protein Expression Center (MPEC), UCSF, Mission Bay, San Francisco, CA, USA, 94158, 13 may 2013, Genentech Hall UCSF, Mission Bay, San Francisco, CA, USA.
3. Presented poster *Piriformospora indica* phosphate transporter (PiPT) expression purification and functional characterization , **Hemant Kumar**, William Harries, Zygy Roe zurz, Samantha Ngaw, Atul K Johri, Robert Stroud, at Anuual Roadmap meeting, Center for Structure of Membrane proteins(CSMP), UCSF, Mission Bay, San Francisco, CA, USA, 94158,14 may 2013 Genentech Hall UCSF, Mission Bay, San Francisco, CA, USA.
4. Presented poster at 58th Biophysical Society Meeting, San Francisco, CA, USA. "Structure of sugar bound Lactose Permease in almost occluded state to Periplasmic side. **Hemant Kumar**, Janet Finer-Moore, Vladimir Kasho, Irina Smirnova H. Ronald Kaback and Robert M. Stroud", 14 Feb to 19 Feb 2014.
5. Presented poster at 62nd Biophysical Society Meeting, San Francisco, CA, USA, "Lactose Permease: Mechanism through structures, **Hemant Kumar**, Ronald Kaback, Robert Stroud, February 17-21, 2018.

Extra-curricular and Co- curricular activities-

- **Student Representative in JNUSU (2006-07) from School of life sciences, JNU.**
- **Organized national level seminar 'BIOSPARKS 07' at school of life sciences, JNU.**

RESEARCH EXPERIENCE DETAILS:

28 Dec 2018 - to Date: **Ramalingaswami Fellow**, Molecular Biology Unit, IMS, BHU, Varanasi, UP, India.
7 Sep 2018 - 27 Dec 2018: **Ramalingaswami Fellow**, Microbiology Department, AIIMS, Raipur, Raipur, Chattisgarh, India.
Sep 2011 - Aug 2018, University of California San Francisco, CA
Mentor: Prof. Robert M. Stroud, Department of Biochemistry and Biophysics
Project1: Structure determination of High affinity phosphate transporter (PiPT)
Role: Started the project, conceptual design, worked through the end of the project resulted in a publication in Nature. This was the first Eukariyotic MFS transporter structure.
Project 2: Biochemical analysis and mechanistic investigation of PiPT
Role: Started the project, conceptual design, worked through the end of the project 2 Manuscripts under preparation.
Project 3: Structure determination of Lactose permease in Outward confirmation
Role: Collaborated with Prof. Ronald Kaback, University of California Los Angeles published the work as 3 publications in PNAS (USA).
Project 4: Stabilization of Lactose permease using Lamma antibodies (Nanobodies)
Role: Collaborated with Prof. Ronald Kaback, University of California Los Angeles, Jan Steyaert (VIB Center for Structural Biology Research, VIB, 1050 Brussels, Belgium; Vrije Universiteit)

PhD and MSc Students

PhD Students		
Name	Year of registration	Research Topic
Mr. Kamal Kishore Rajak (DBT JRF)	2018	Study of anti-mycobaterium activity of different medicinal plants and target site identification
Ms. Khushbu	2019	Cloning, Expression and Biochemical characterization of nutrient transporters of *Plasmodium sp.*

M.Sc. Students Guided		
Name	Duration	Project
Ms. Akriti Suyal	1 month (Jun 2019-July 2019)	Preparation of Ni-NTA Beads and Screening of river water for antibiotic resistance bacteria from TRIVENI SANGAM at PRAYAGRAJ
Ms. Shalini Negi	1 month (Jun 2019-July 2019)	Preparation of Ni-NTA Beads and Screening of river water for antibiotic resistance bacteria from TRIVENI SANGAM at PRAYAGRAJ
Ms. Avantika Negi	6 months (Jan 2020-July 2020)	Identification and analysis of membrane proteins of *Mycobacterium tuberculosis* H37Rv from 2-4.41Millionbp
Ms. Ashu	6 months (Jan 2020-July 2020)	Identification and Analysis of Transmembrane Proteins in *Mycobacterium tuberculosis from 1bp to 2.0 Million bp*

Sanctioned Projects:

Title of the project	Duration	Granting Agency	Grant Amount	Role
Understanding the mechanistic details of Membrane Transporters of *mycobacterium* and *plasmodium*	**2018-2023**	**DBT**	**INR 88 Lakh**	**PI**
Establishing the North Indian cryogenic EM Facility at IIT Kanpur	**2021-2026**	**SERB**	**INR 28.53 Crore**	**Co-PI**

Projects Submitted:

Title of the project	Duration	Granting Agency	Grant Amount	Role	Status
Exploring Anti-infective Potential of Panchagavya: Metabolomics and Proteomics	**2021-2024**	**DST (PI: Dr Shreyansh Kumar Jain, Assistant Professor,** Department of Pharm. Engg & Tech, Indian Institute of Technology (BHU))	**65.526 Lakh**	**Co-PI**	Submitted and about to be granted, Committee recommended the Proposal and asked to revise the budget
To develop Eis inhibitors targeting aminoglycosides resistant Mycobacterium tuberculosis to restore the efficacy of second line anti-TB drug kanamycin	**2021-2024**	**DST (PI: DR. Vivek Kumar Gupta**, **Scientist-D**, Department Of Biochemistry ICMR-National JALMA Institute for Leprosy and Other Mycobacterial Diseases , Indian Council OF Medical Research, Agra, INDIA)		**Co-PI**	**Submitted in April 2021**
Characterization and drug design against membrane MDR proteins of	**2021-2024**	**ICMR (PI: Prof. Rakesh Bhatnagar**, **Adjunct Professor,** **Prof. Sonika Bhatnagar**,	**98.389 Lakh**	**Co-PI**	**Submitted**

TB		**Professor and Head,** Department of Biological Sciences and Engineering, Netaji Subhas University of Technology, Sector-3, Dwarka, N.Delhi 10078 AND Prof. Rakesh Bhatnagar, Director, Divacc Research Laboratory, BSL3 Facility, JNU, N.Delhi 110078)			

REFERENCES:

1. **Prof Robert M. Stroud**

Professor, Department of Biochemistry and Biophysics, University Of California San Francisco, S412C UCSF-Genentech Hall, 600, 16th. Street, San Francisco, California, USA, 94158-2517.

Phone: 001-415.476.4224 Fax: 001-415.476.1902 **Email: stroud@msg.ucsf.edu**

2. Prof. Atul Kumar Johri,

School Of Life Sciences, JNU, New Delhi,110067 ,

Off. Phone:+91-11-26704511 Fax:+91-11-26742558 **Email: ajohri@jnu.ac.in, akjohri14@yahoo.com**

3. Prof. Rakesh Bhatnagar (Vice Chancellor BHU)

School Of Biotechnology, Jawaharlal Nehru University, New Delhi-110067

Ph No +91-11-26704079 **Email: rakeshbhatnagar@jnu.ac.in**

4. Prof. Dr. S. Srikrishna, (*ICMR International Fellow*, *Stanford University, CA, USA)*

Department of Biochemistry, Institute of Science, Banaras Hindu University, VARANASI – 221005 Uttar Pradesh, INDIA. Contact: (Off):+91-542-6702460 Tel(Res):+91-542-2575780 Fax(Univ):+91-542-2368174 **Email:skrishna@bhu.ac.in sskrishna2000@yahoo.com**

5. Prof. Anil Kumar, Head,

School of Biotechnology, Devi ahilya University, Khandwa Road, Indore 452001 INDIA

Phone no: +91-731-2470 373 (O) Fax: +91-731-2470 372 **Email: ak_sbt@yahoo.com**

6. Dr. Vinod Kumar Tiwari, Assistant Professor,

Department of Pharmaceutical Engineering & Technology, Indian Institute of Technology (BHU)

Varanasi-221005, Uttar Pradesh, India

Contact no: +91 7069532713, Email: vtiwari.phe@iitbhu.ac.in

7. Dr Shreyansh Kumar Jain, Assistant Professor

Department of Pharmaceutical Engineering & Technology, Indian Institute of Technology (BHU)

Varanasi-221005, Uttar Pradesh, India

Contact no: +91 8764331736, Email: sjain.phe@iitbhu.ac.in, shreyansrj@gmail.com

PERSONAL PARTICULARS:

Fathers Name	: Shri Gaya Prasad	Mothers Name	: Smt Girija Pathak
Date of birth	: 6 June 1978	Gender	: Male
Languages Known	: English, Hindi.	Nationality	: Indian.

Permanent Address : S/O Shri G.P. Pathak, Vijayalakshmi nagar, Jamsarar Road, Dongergaon, District: Rajnandgaon, (Chattisgarh), India, Postal code:491661