

## Dr. ANTRESH KUMAR, (M.Phil., Ph.D.)

Associate Professor

Department of Biochemistry,

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### Research Area

- ❖ Discovery and development of antifungals & antimicrobials against *Candida albicans* and *S. aureus*, Fluoride and Drug resistance.

### Qualification

- ❖ Ph.D. School of Life Sciences, Jawaharlal Nehru University, New Delhi.
- ❖ M. Phil School of Life Sciences, Jawaharlal Nehru University, New Delhi.
- ❖ M.Sc. Department of Biotechnology, Himachal Pradesh University, Shimla, H.P.

### Experience: Total >10 years (Teaching & Research experience)

June 2012- January 2020	Assistant Professor (Senior Scale), Department of Biotechnology, Central University of South Bihar, Gaya.
June 2012- May 2016	Assistant Professor, Department of Biotechnology, Central University of South Bihar, Gaya.
July 2011- May 2012	Lecturer, Department of Biotechnology & Bioinformatics, JUIT, Wagnaghat, Shimla, H.P.
June 2010 – July 2011	Postdoctoral Fellow (PDF), School of Life Sciences, J.N.U., New Delhi.
November 08 – October 09	Predocctoral fellow (PDF), National Cancer Institute (NCI), NIH, Bethesda, USA.
September 03 – January 04	Research Interns, Division of Biotechnology, CSIR-IHBT, Palampur, H.P.

### Courses taught

- **Ph.D. Biotechnology:** Instrumentation, Research methodology, Advanced molecular biology. Scope and Techniques of Research in Biological Sciences. Fundamentals of Research Methodology,
- **M.Sc. Biotechnology:** Instrumentation: tools & techniques in Biotechnology, Enzymology, Molecular Biology, Biochemistry, Microbiology, Bioprocess Engineering, Biosafety, Bioethics & Intellectual Property Rights (IPR), Protein Biochemistry.
- **M. Tech. Biotechnology:** Gene cloning.
- **B.Tech. Biotechnology:** Molecular Biology

### **Research Supervision**

- ❖ Ph.D. supervised: **01**
- ❖ Ph.D. enrolled: **02**
- ❖ PG supervised: **24**

### **Research project Sanctioned /Completed: 03**

- ❖ Identification of genes involved in the biosynthesis of Echinocandin B: a first line Antifungal, DST-FAST- track Young Scientist.
- ❖ Screening & characterization of antimicrobial activity of fungal secondary metabolites to combat multidrug resistance in *S. aureus*, SERB-EMEQ.
- ❖ Development of fungal consortium for second generation biofuel production, University Grant Commission under the UGC scheme “Start-Up Grant for Newly Recruited Faculty” program.

**Reviewer:** Reviewer of various peer reviewed journals of high repute.

### **Awards/Achievements**

- ❖ Travel Grant awarded, Asian Conference on Science, Technology & Medicine (ACSTM), Dubai.
- ❖ International Genetically Engineered Machine (iGEM) qualified at Asia level, Hong Kong, Japan.
- ❖ Research Fellowship as Research Associate (RA) by the CSIR, New Delhi.
- ❖ Travel grant-CSIR to attend Gordon Research Conference (GRC), Multi-Drug Efflux Systems: From Molecular mechanisms to pharmacological modulation at Les Diablerets, Switzerland.
- ❖ Travel grant-DST to attend Gordon Research Conference (GRC), Multi-Drug Efflux Systems: From Molecular mechanisms to pharmacological modulation at Les Diablerets, Switzerland.
- ❖ Bursary award-FINSysB Conference on Candida Infection Biology-fungal armoury, battlefields and host defences conference, Acquafredda di Maratea, Italy.
- ❖ Travel grant-Gordon Research Conference (GRC) on Multi-Drug efflux systems- Understanding and Overcoming Multi-Drug Efflux Pumps in Disease”, Galveston, Texas, USA.
- ❖ Pre-doctoral fellowship, under the Research exchange program, NIH, USA.
- ❖ UGC-JRF by the Joint CSIR-UGC (2003).
- ❖ CSIR-Research Intern, “CSIR Diamond jubilee Research Intern Award Scheme”, IHBT (CSIR), Palampur, HP.
- ❖ Student fellowship- Department of Biotechnology (DBT), Govt. of India during M. Sc. in Biotechnology.

### **Academic responsibilities held**

- Program Coordinator, Biotechnology Program, Central University of South Bihar (CUSB), Patna. (2012- 2016)
- Secretary, Institutional Biosafety Committee (IBSC)-Central University of South Bihar, Patna. This committee was constituted and approved by the DBT, Govt. of India. (2012-2015).

### **Selected Publication last three years**

- ❖ Kumari N, Kumari V, Kumar V, Kumar S, **Antresh Kumar** (2019) Ouabain potentiates the antimicrobial activity of aminoglycosides against *Staphylococcus aureus*. *BMC Comp Alt Med*. 19:119. (IF 2.73)
- ❖ Kaur R, Singh R, **Kumar A**, Singh K (2019) Click chemistry approach to Isoindole-1,3-dione tethered 1,2,3-triazole derivatives (SO-2019-04-0012-L.R1). *SynOpen*.2019; 03(02): 67-70.
- ❖ Arvind Kumar, Vinay Kumar, **Antresh Kumar** (2019) Functional characterization of host toxic EcdB transcription factor protein of echinocandin B biosynthetic gene cluster. *Biotech App Biochem*. doi: 10.1002/bab.1763. (IF 1.7)
- ❖ Banerjee A, Viswakerma P, **Kumar A**, Lynn A, Prasad R (2019) Information theoretic measures and mutagenesis identify a novel linchpin residue involved in substrate selection with in nucleotide-binding domain of an ABCG family exporter Cdr1p. *Arch Biochem Biophys* 2019 Mar 15;663:143-150. doi: 10.1016/j.abb.2019.01.013 (IF 3.0)
- ❖ Arvind Kumar, **Antresh Kumar** (2019) Biosynthetic regulation of echinocandin B: From pathway specific to environmental cues responsive regulation. *J Trauma Crit Care*, 3. PP 63.
- ❖ Kumar S, Kumar A, Kaushal M, Kumar P, Mukhopadhyay K, **Kumar A** (2018) Fungal-derived xenobiotic exhibits antibacterial and antibiofilm activity against *S. aureus*. *Drug Discoveries & Therapeutics*.12(4):214-223. (IF 1.47)
- ❖ Kumar A, Jaiswal V, Kumar V, Ray A, **Kumar A**. (2018) Functional redundancy in Echinocandin B in-cluster transcription factor ecdB of *Emericella rugulosa* NRRL 11440. *Biotech Rep*. e00264; 1-8. (IF 1.76).
- ❖ **Antresh Kumar**, Ajay K. Singh (2017) Ouabain as a potential biofilm inhibitor against *Staphylococcus aureus*. *Antimicrobial Resistance and Infection Control* 2017, 6 (3):52, PP 110.
- ❖ Bera K, Rani P, Kishor G, Agarwal S, **Kumar A**, Singh DV (2017) Structural elucidation of TMD0 Domain of EcdL: An MRP1 family of ABC transporter protein revealed by atomistic simulation. *J. Biomol. Stuc. Dyna*. doi.org/10.1080/07391102.2017.1372311 (IF 3.2).

### **Book Chapter**

- ❖ Arvind Kumar, **Antresh Kumar** (2019) Synthesis and regulation of fungal secondary metabolites. Springer, Microbial Technology for Welfare of Society (ISBN 978-981-13-8843-9.).
- ❖ **Antresh Kumar**, Rakesh Kumar (2017) Soy protein film as an antimicrobial. Soy Protein: Properties, Health Effects and Research Advances (ISBN: 978-1-53612-091-2), Nova Science Publishers, Inc, USA.
- ❖ Rakesh Kumar, **Antresh Kumar** (2017) Molecular Weight and Processing of Soy Protein Edible Film. Soy Protein: Properties, Health Effects and Research Advances (ISBN: 978-1-53612-091-2), Nova Science Publishers, Inc., USA.

### **Gene bank submission:**

- 2018:** PMID-MH298202; Characterization of Zn(II)Cys6, ecdB mRNA of echinocandin B biosynthetic gene cluster.
- ❖ **2016:** PMID- KT362739; *Pseudomonas aeruginosa* strain SIA001 16S ribosomal RNA partial sequence.
  - ❖ **2004:** PMID 30268563-AJ549755; Characterization of Indian isolate of *ISMV* causing mosaic disease on *Iris*.

### **Invited Speaker**

- ❖ Ouabain potentiates the antimicrobial activity of aminoglycosides against *S. aureus*. ACSE/ACSTM, Dubai, 12-14 Feb 2019.
- ❖ Un-regulatory actions of ecdB transcription factor present in Echinocandin B biosynthetic gene cluster, 2<sup>nd</sup> World Biotechnology Congress December 04-05, 2017 Sao Paulo, Brazil.
- ❖ Functional analysis of H-loop residues of Cdr1p, an ABC transporter of human fungal pathogen *Candida albicans*, FINSysB Conference Candida Infection Biology-fungal armoury, battlefields and host defences. 10-14 October, 2011 Acquafredda di Maratea, Italy.
- ❖ Signature motifs in the nucleotide-binding domains of CaCdr1p are functionally asymmetric in an International conference 28<sup>th</sup> SYMTE held on 23<sup>rd</sup>- 27<sup>th</sup> Sep 2010 conducted by J.N.U., New Delhi.
- ❖ Crystallization of N-terminal ATPase (NBD1) of Cdr1p, an ABC transporter of *Candida albicans* in the Graduate Partnerships Program (GPP) retreat held on 16<sup>th</sup> July 2009 conducted by Graduate Student Council (GSC), National Institutes Health (NIH), Bethesda, USA.
- ❖ Work presentation in the laboratory of Prof. Joachim F. Ernst, Institute for Microbiology, Heinrich-Heine-University Düsseldorf, Germany, October 2008.

### **Expert Committee Member**

- External examiner for PhD viva-voce examination, Department of Biophysics, AIIMS, New Delhi.
- Member, Consultancy Policy, CUSB, Gaya.
- Member, Manual for Sponsored Research (MSRP), CUSB, Gaya