

Akhilesh Kumar, PhD
Assistant Professor
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Academic Qualification

INSTITUTION AND LOCATION	DEGREE	MM/YY	FIELD OF STUDY
University of Allahabad, Allahabad, India	B.Sc.	06/2002	Botany, Zoology and Chemistry
Banaras Hindu University, Varanasi, India	M.Sc.	05/2005	Botany
Institute of Microbial Technology (JNU), Chandigarh, India	Ph.D.	03/2012	Molecular Biology and Biochemistry

Work experience

Position held	Name of the institute	From	To
Postdoctoral Fellow	Miller School of Medicine, University of Miami, Miami, FL, USA	June, 2012	April, 2017
Assistant Scientist	Miller School of Medicine, University of Miami, Miami, FL, USA	May, 2017	December, 2017
Assistant Professor	Banaras Hindu University, Varanasi, India	December, 2017	Present

Personal Statement: I have a broad training in Genetics, Molecular Biology, Biochemistry and Cell Biology. During my Ph.D. at IMTECH Chandigarh, India, I discovered two missing enzymes of the yeast γ -glutamyl cycle involved in glutathione (a major cellular antioxidant) metabolism. This research led to the discovery of an alternate pathway of glutathione degradation. During my postdoc at the University of Miami, FL, USA, I worked on the posttranslational modification arginylation, which is addition of an extra arginine to its target proteins, and is carried out by an enzyme called Arginyltransferase-1 (Ate1). I discovered that arginylation is essential for stress response, apoptosis, mutation and cancer suppression. At present, I am working as an assistant professor at the Banaras Hindu University, Varanasi, India, and my current goals are to discover the molecular mechanisms of Ate1-mediated protein degradation, and the role of Ate1 in neurodegenerative diseases.

A) Academic Honors / Awards / Distinctions

- Received the most productive young researcher award (Faculty member, below 40 years of age) by Institute of Science, BHU, Varanasi, India, March 2019.
- Awarded Second Prize for a poster presentation at the 8th Annual Postdoctoral Research Day Poster Competition, University of Miami, February, 2017.
- Received Travel award from Sylvester Cancer (University of Miami), to attend Cancer Biology Annual Retreat, Pittsburgh, 2016.
- Selected to deliver a Talk on my postdoctoral research titled “Ate1-mediated posttranslational arginylation is essential for stress response regulation and mutagenesis suppression” at ASBMB annual meeting, 2016 (San Diego USA, 2-6 April).
- Received Scholarship to attend Proteomics Course (2016), at Cold Spring Harbor Laboratory (CSHL).
- Received Scholarship to attend Yeast Genetics and Genomics Course (2014), at Cold Spring Harbor Laboratory (CSHL).
- Received Travel award from ASBMB, to present poster titled “Posttranslational arginylation is essential for stress response” in ASBMB Annual Meeting 2014, San Diego.
- Awarded Junior/Senior Research Fellowship (JRF/SRF) from Council of Scientific and Industrial Research (CSIR), Government of India (2005-2011).

B) Peer-reviewed Publications

1) **Kumar A**, Birnbaum MD, Moorthy BT, Singh J, Palovcak A, Patel DM and Zhang F. Insertion/deletion-activated frame-shift fluorescence protein is a sensitive reporter for genomic DNA editing. **BMC Genomics**, 20, Article number: 609 (2019) (Impact factor 3.7)

2) Birnbaum, M.D.; Zhao, N.; Patel, D.M.; Heidman, L.; **Kumar, A.**; Morgan, W.; Ban, Reis, IY.; Chen, X.; Kryvenko, O.; Gonjalgo, M.; Jorda, M.; Burnstein, K.; Zhang, F. Reduced Arginyltransferase 1 is a driver and a potential prognostic indicator of prostate cancer metastasis. **Oncogene**, doi: 10.1038/s41388-018-0462-2. Epub 2018 Sep 3. (2019) (Impact Factor: 6.9)

3) Sharma, D.; Kaur, H.; Saraf, J.; Vats, K.; Pravalika, K.; Wanve, M.; Kalia, K.; Borah, A.; **Kumar, A.**; Wang, X.; Yavagal, D.; Dave, K.; Bhattacharya, P. Mitochondrial Dysfunction in Stroke: Implication of Stem Cell Therapy. **Translational Stroke Research**. 10, 121-136 (2019) (Impact Factor: 8.26)

4) Birnbaum, M.D.; Nemzow, L.; **Kumar, A.**; Gong, F.; Zhang, F. A rapid and precise mutation-activated fluorescence reporter for analyzing acute mutagenesis frequency. **Cell Chemical Biology** (earlier known as Chemistry & Biology) 25, 1038-1049, (2018) (Impact factor: 6.7)

5) Kaur, A.; Gautam, R.; Srivastava, R.; Chandel, A.; **Kumar, A.**; Karthikeyan, S.; Bachhawat, A.K. The structure of ChaC2: An enzyme for slow turnover of cytosolic glutathione. **Journal of Biological Chemistry**, 292, 638-651, (2017) (Impact Factor: 4.1)

6) **Kumar, A.**; Birnbaum, M.D.; Morgan, W.; Singh, J.; Barrientos, A.; Zhang, F. Posttranslational arginylation enzyme Ate1 affects DNA mutagenesis by regulating stress response. **Cell Death and Disease**. 7, e2378; doi:10.1038/cddis.2016, 1-16. (2016) (Impact Factor: 6.2)

7) Rai, R.; Zhang, F.; Colavita, K.; Leu, N.A.; Kurosaka, S.; **Kumar, A.**; Birnbaum, M.D.; Györfy, B.; Dong, D.W.; Shtutman, M.; Kashina, A. Arginyltransferase suppresses cell tumorigenic potential and inversely correlates with metastases in human cancers. **Oncogene**. 35, 4058-4068 (2016) (Impact Factor: 6.9)

8) Chavez, J.D.; Eng, J.K.; Schweppe, D.K.; Cilia, M.; Rivera, K.; Zhong, X.; Wu, X.; Allen, T.; Khurgel, M.; **Kumar, A.**; Lampropoulos, A.; Larsson, M.; Maity, S.; Morozov, Y.; Pathmasiri, W.; Perez-Neut, M.; Pineyro-Ruiz, C.; Polina, E.; Post, S.; Rider, M.; Tokmina-Roszyk, D.; Tyson, K.; Vieira Parrine Sant'Ana, D.; Bruce, J.E. A general method for targeted quantitative cross-linking mass spectrometry. **PLOS One**. DOI: 10.1371/journal.pone.0167547, 1-14. (2016) (Impact Factor: 2.806)

9) Zhang, F.; Patel, D.M.; Colavita, K.; Rodionova, I.; Buckley, B.; Scott, D. A.; **Kumar, A.**; Shabalina, S.A.; Saha, A.; Chernov, M.; Osterman, A.L.; Kashina, A. Arginylation regulates purine nucleotide biosynthesis by enhancing the activity of phosphoribosyl pyrophosphate synthase. **Nature Communications**. 6, 7517, doi:10.1038/ncomms, 1-9. (2015) (Impact Factor: 12.124)

10) **Kumar, A.**; Tikoo, S.; Maity, S.; Sengupta, S.; Sengupta, S.; Kaur, A.; Bachhawat, A.K. Mammalian proapoptotic factor ChaC1 and its homologues function as γ -glutamyl cyclotransferases acting specifically on glutathione. **EMBO Reports**. 13, 1095-1101. (2012) (Impact Factor: 10.6)

11) **Kumar, A.**; Bachhawat, A.K. OXP1/YKL215c encodes an ATP-dependent 5-oxoprolinase in *Saccharomyces cerevisiae*: functional characterization, domain structure and identification of actin-like ATP-binding motifs in eukaryotic 5-oxoprolinases. *FEMS Yeast Research*. 10, 394-401. (2010) (Impact Factor: 2.6)

12) Calpena E, Deshpande A, Yap S, **Kumar A**, Manning NJ, Bachhawat AK, Espinós C. New insights into the genetics of 5-oxoprolinase deficiency and further evidence that it is a benign biochemical condition. **European Journal of Pediatrics**, 174, (3), pp 407-411 (2015) (Impact Factor: 2.25)

13) **Akhilesh Kumar**, Bachhawat AK. Pyroglutamic acid: throwing light on a lightly studied metabolite **Current Science** , 2012, , 102 (2): 288-297 (Impact Factor: 0.883)

14) **Akhilesh Kumar**, Bachhawat AK. A futile cycle, formed between two ATP-dependant gamma-glutamyl cycle enzymes, gamma-glutamyl cysteine synthetase and 5-oxoprolinase: the cause of cellular ATP depletion in nephrotic cystinosis? **Journal of Biosciences**, 2010, 35, 21-25 (Impact Factor: 1.53)

C) International Patent Filed:

Method to detect DNA mutagenesis. Zhang, F.; Kumar, A.; Birnbaum, M.D. International application number (PCT/US2017/054494) and international publication number (WO2018064571), **Publication Date-April-2018**

D) Book Chapter

Anand K. Bachhawat, Dwaipayan Ganguli, Jaspreet Kaur, Neha Kasturia, Anil Thakur, Hardeep Kaur, **Akhilesh Kumar** and Yadav Amit. **Glutathione production in yeast: Yeast Biotechnology: Diversity and application** (2008) (Published by Springer)

E) Sponsored projects undertaken as PI

Agency	Title of projects	Duration	Sanctioned Amount	Completed/ongoing
UGC	Studies on the structure-function analysis of Arginyl-transferase 1 (Ate1): An essential enzyme of the N-end rule pathway	2019-2021	10 Lacs	Ongoing