CURRICULUM VITAE

DR. PRAVEEN KUMAR S.K
Assistant professor,
Department of Biochemistry,
Karnatak University Dharwad-03.
praveenkumarsk@gmail.com
praveenkumarsk@kud.ac.in
+91-9480374716

Area of Research:

- Protein Biology: To understand the role of stress response proteins in microbial aboptations to the extreme climatic conditions: Isolating the wild type microbes from the local niche, followed by mimicking the similar stress and stuying the protein expression pattern.

- Corelating the contribution of stress response protiens in resolving the neurodegenerative diseases using yeast and other model systems. In-vitro and in-vivo protein interaction studies by cloning of desired protein and elucidating protein mechanization.

Academic Qualifications:

2012-2014	**Post-Doctoral Research** Dept of Biochemistry, Indian Institute of Science, Bangalore
2008-2012	**Ph.D in Biochemistry** Dept of Biochemistry, Gulbarga University Kalaburagi.
2007-2008	**M.Phil in Biochemistry** Dept of Biochemistry, Gulbarga University Kalaburagi.
2004-2006	**M.Sc Biochemistry** Dept of Biochemistry Gulbarga University Kalaburagi.

Projects/ Grants and Awards:

- Karnatak University Dharwad **Seed Grant** on "**Understanding the efficacy of various vitamins as an inhibitor of advanced glycated end-product formation**", Department of Biochemistry, Karnatak University Dharwad-03 (2021-2022).
- **UGC-BSR** Research **start-up grant** on **"Three phase portioning: a rapid in-expensive and single step technique for purification of α-galactosidase; its characterization and application"** from **UGC New Delhi**.
- Research Associate **(RA)** award by Dept. of Biotechnology **(DBT)** Govt. of India. (2012-2014).
- Senior Research Fellowship **(CSIR-SRF)**, award from Council of Scientific and Industrial Research **(CSIR)**, New Delhi Govt. of India. (2010-12).

Abstract of the Ph.D Thesis:

α-D-Galactosidase (α-D-galactoside-galactohydrolase. E.C 3.2.1.22) is widely distributed in microorganisms, plants, and animals. α-Galactosidase catalyzes the hydrolysis of simple to complex oligosaccharides and polysaccharides containing α-1, 6 linked galactosyl group. Microbial mannanases have become biotechnologically important since they target the hydrolysis of the complex polysaccharides of plant tissues into simple molecules like manno-oligosaccharides and mannoses.

Aspergillus oryzae a GRAS status organism was used to produce α-galactosidase by immobilizing in *k*-carrageenan and various other matrices. The exponentially grown *A. oryzae* cells in ca-alginate and *k*-carrageenan were employed for the hydrolysis of raffinose family oligosaccharides, and almost 70-80% of the RFO's were hydrolyzed, as confirmed by TLC and HPLC methods.

Smart polymer can be made soluble or insoluble just by a suitable stimulus such as change of pH, addition of ions, etc. The α-galactosidase of *A. oryzae* purified by affinity precipitation, 69% activity yield and the fold purification of 14 was obtained. The simple & efficient purification protocol of affinity precipitation helps in lowering the production cost of the pure enzyme.

A novel strain *Streptomyces mutabilis* MPG was isolated, characterized & identified based on the biochemical and phylogenetic studies. The process parameters for maximum enzyme production were studied & raffinose with guar gum enhanced the enzyme production. The enzyme extract was used for the degradation of poly-galactomannan like guar gum, locust bean gum solution and noticeable reduction in the viscosity was obtained.

The optimum culture parameters for the maximum production of β-mannanase was studied, the locust bean gum enhanced the enzyme yield from both *S. mutabilis* and *B. megaterium*. The β-mannanase from both the strains were purified by a simple & versatile three phase partitioning (TPP). The molecular weight of the purified mannanases from *S. mutabils* and *B. megaterium* was 36 and 39 kDa, respectively.

Abstract of Post Docotral work:

The primary goal is to better understand the physiological role of Frataxin (a protein involved in iron homeostasis) in the disease Freidreich's Ataxia, using yeast and human cell lines as model systems. The nature of Frataxin's interaction with other critical proteins in the Fe/S biogenesis process, as well as their significance in the biogenesis, is explored using in-vivo and in-vitro biochemical and biophysical approaches.

Iron-sulfur (Fe-S) clusters are multifunctional cofactors that regulate a variety of physiological processes, including energy generation through cellular respiration. In human mitochondria, the Fe-S clusters are first built on a conserved scaffold protein called ISCU, which works in tandem with iron and sulphur donor proteins. Myopathy is characterised by muscle atrophy and heart enlargement when ISCU function is lost.In addition to homozygous ISCU mutation (g.7044G>C), compound heterozygous patients with severe myopathy have been identified to carry (c.149G>A) missense mutation converting glycine 50 residue to glutamate. However, the physiological defects and molecular mechanism associated with G50E mutation have not been elucidated. In this report, we uncover mechanistic insights concerning how the G50E ISCU mutation in humans leads to development of severe ISCU myopathy, using human cell line and yeast as the model systems. The biochemical results highlight that, G50E mutation results in compromised interaction with the sulfur donor NFS1 and J-protein HSCB protein, thus impairing the rate of Fe-S cluster synthesis. As a result, electron transport chain (ETC) complexes show significant reduction in their redox properties leading to loss of cellular

respiration. Furthermore, the G50E mutant mitochondria display enhancement in iron level and reactive oxygen species (ROS), thereby causing oxidative stress leading to impairment in the mitochondrial functions. Thus, our findings provide compelling evidence that respiration defect due to impaired biogenesis of Fe-S clusters in myopathy patients, leads to manifestation of complex clinical symptoms.

Papers Published in International/National Journals:

- H, HM., M PB., D, SB., S KN., M,R., B, Chakraborty., P, SS., **Praveen Kumar, S.K.**, S, Nayaka. (2021). Degradation of catechol by free and immobilized cells of pseudomonas aeruginosa (mtcc424). *International Journal of Recent Scientific Research 12 (11)*, 43459-43462.
- K.S, Vinayaka., P.K, TR., **Praveen Kumar, S.K**. (2017). Antimicrobial activity of Coccocarpia erythroxyli (Spreng.) swinc. & krog. *Journal of Pharmacognosy and Phytochemistry 6 (6)*, 2419-2422.
- **Praveen Kumar, S.K.,** M, S., P. K, POLEKAR., D. M, MM NAIK.(2017) Silk worm as a model to evaluate hypoglycemic action. *Indian Journal of Scientific Research. : 16 ((1))*, 1-9.
- S. V, Kambhar., **Praveen Kumar, S.K.,** S, Mavinamar., P, Kengnal. (2017). Pollen morphometrics in the genus Indigofera L. from Karnataka. (2017). *International Journal of Botany Studies 2 (6)*, 45-51.
- Saha, P. P., Srivastava, S., **Praveen Kumar, S.K.**, Sinha, D., & D'Silva, P. (2015). Mapping Key Residues of ISD11 Critical for NFS1-ISD11 Subcomplex Stability. *Journal of Biological Chemistry*, *290*(43), 25876–25890. https://doi.org/10.1074/jbc.M115.678508
- Saha, P. P., **Praveen Kumar, S.K.**, Srivastava, S., Sinha, D., Pareek, G., & D'Silva, P. (2014). The Presence of Multiple Cellular Defects Associated with a Novel G50E Iron-Sulfur Cluster Scaffold Protein (ISCU) Mutation Leads to Development of Mitochondrial Myopathy. *Journal of Biological Chemistry*, *289*(15), 10359–10377. https://doi.org/10.1074/jbc.M113.526665
- **Praveen Kumar, S.K.**, VH Mulimani. (2011). Immobilization of Aspergillus oryzae with κ-carrageenan for soybean oligosaccharide hydrolysis.(2011). *Food Science and Biotechnology 20 (6)*, 1691-1697.
- Shankar, S. K., **Praveen Kumar, S.K.**, & Mulimani, V. H. (2011). Calcium alginate entrapped preparation of α-galactosidase: Its stability and application in hydrolysis of soymilk galactooligosaccharides. *Journal of Industrial Microbiology & Biotechnology*, *38*(9), 1399–1405. https://doi.org/10.1007/s10295-010-0925-0
- A.G.G, Patil., **Praveen Kumar, S.K.**, VH Mulimani., Y, Veeranagouda., K Lee. (2010). α-galactosidase from Bacillus megaterium VHM1 and Its Application in Removal of Flatulence-Causing Factors from Soymilk. *Journal of Microbiology and Biotechnology 20 (11)*, 1546-1554
- **Praveen Kumar, S.K.**, & Mulimani, V. H. (2010). Continuous hydrolysis of raffinose family oligosaccharides in soymilk by fluidized bed reactor. *LWT - Food Science and Technology*, *43*(2), 220–225. https://doi.org/10.1016/j.lwt.2009.08.006

Conferences/Workshops Attended:

- 76th Meeting of Society of Biological Chemists of India (2007), Sri Venkateshwara University, Tirupati.
- National Symposium on Bioactive molecules from discovery to industry. Dept. of Studies in Biochemistry Mysore University. April 6-7, 2009.
- International Conference on Role of Biomolecules in Food Security & Health. (2010) Banaras Hindu University, Varanasi.
- 78th Meeting of Society of Biological Chemists of India. (2010), Indian Institute of Science, Bangalore.
- Frontiers in Modern Biology-2013. Dept. of Biochemistry, IISc, Bangalore (June 15-16, 2013).
- International Symposium on Conceptual Advances in Cellular Homeostasis Regulated by Proteases and Chaperones. Advanced Centre for Treatment Research and Education in Cancer, Tata Memorial Centre, Kharghar, Navi Mumbai (ACTREC). December 3-6, 2013).
- National Conference on Enzyme Research in Agriculture, Food and Industrial Biotechnology. Maharani's Science College for Women's, Bangalore. (March 12th-13th 2015).
- International Conference on Translational Research in Free Radicals, Micronutrient Antioxidants and Functional Food, All India Institute of Medical Science, New Delhi. 18-20 Feb, 2018.

DECLARATION

I hereby declare that all the information furnished above is true to my knowledge.

Place: Dharwad
Date:

with sincere gratitude

Dr. Praveen Kumar S K