

SCHOOL OF SCIENCES



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EDUCATIONAL QUALIFICATIONS

Ph.D. (Animal Biotechnology), 2017, ICAR-National Dairy Research Institute, Karnal, Haryana, India.

M.Sc. (Biotechnology), 2011, Department of Biotechnology, Kurukshetra University, Kurukshetra, Haryana, India.

B.Sc. (Zoology, Botany, Chemistry), 2004, GNG College, Kurukshetra University, Kurukshetra, Haryana, India

WORK EXPERIENCE

Assistant Professor (06/2018-ongoing), Indrashil University, Rajpur, Mehsana, Gujarat, India

Assistant Professor (12/2017-04/2018), Sharda University, Greater Noida, U.P. India

SUBJECTS TAUGHT

- Cell Biology [BIO-401] [BIO 2 104],
- Enzymology [BIO-405]BIO 2 201
- Genetic Engineering [BIO 403]
- Recombinant DNA Technology [BIO 3 205]
- Analytical Tools and Techniques [BIO-406]
- Cell Biology and Enzymology Lab [BIO 1 105]

RESEARCH AREA

Area of Interest: Host-pathogen and Host-probiotics interaction studies, Molecular gene cloning, expression and purification of proteins (probiotics, plants and mammals), biophysical and structural analysis of proteins, animal cell and tissue culture (Immunostaining, pathogen exclusion assays)

Previously, I have done cloning, expression and purification of surface layer proteins (Slps) of three different species of probiotic lactic acid bacteria along with functional and physicochemical analysis of these rec. proteins. The study revealed the possible role of Slps in mediating binding of probiotics with host tissues and that they could be used to compete and exclude the binding of pathogens, so these proteins may find application in the prophylaxis of mucosal infections.

Role of these proteins in adhesion and pathogen exclusion from human intestinal cells and tissue were determined using Caco-2, HT-29 cell lines (human intestinal cell lines) and human intestinal tissue. Binding potentials of these proteins to intestinal cell lines were observed by immunofluorescence and pathogen exclusion ability was analyzed by pour plating method. Biophysical analysis of Surface layer proteins was done i.e. Thermal denaturation by UV-Visible spectrophotometer, Secondary structure determination by

Circular Dichroism, pH stability by fluorescence spectrophotometer. Immunomodulatory roles of Slps were determined by analyzing up and down regulation of inflammatory cytokines (Real-time PCR).

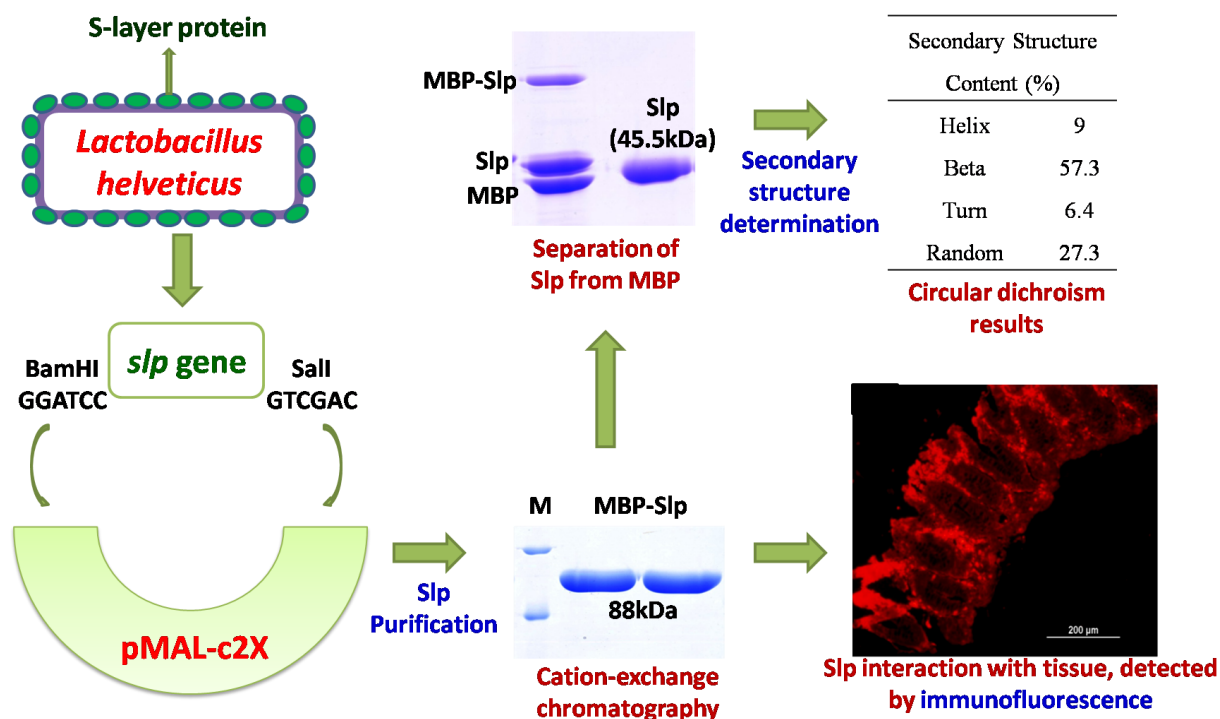


Figure 1: Cloning, expression, purification of probiotics surface proteins and its functional characterization

PROJECTS

- ‘Preparation of florescent bricks’ sponsored by Atal Incubation Centre (worth- 2 lakhs)
 - Group – Ms. Shipra Pandey and other M. Sc students

HONOR/AWARD

S.No	Name of Award	Awarding Agency	year
1	I st prize in Oral presentation	Biotechnology conference in Vigyan Gurjari-Azadi ka mahotsav organized by GBRC	2022
2	ICAR-NET, Animal Biotech	Indian Council of Agriculture Research (ICAR)	2021
3	I st prize in flash talk	E-symposium on recent trend in biology organized by Charusat University, Changa, Gujarat	2021
4	3 rd prize in e-poster presentation	US-Indo training on Flow Cytometry and its Applications in Biological Research and Clinical Diagnostics	2021

5	Best paper presentation Award	International Conference on Advances in Medical and Industrial Biotechnology (ICAMIB 2019) held at Chennai, India	2019
6	Young Investigator Award- Oral presentation	3 rd Biennial Pai conference and International symposium on Stress, Microbiome and Probiotics, held at Bhubaneswar, India	2016
7	ICAR-NET, Agriculture Biotech	Indian Council of Agriculture Research (ICAR)	2013 and 2014
8	UGC-JRF/SRF fellowship for Ph. D with all India 56th Rank	Joint CSIR-UGC JRF	2012-2016
9	Secured 4th Rank for PhD entrance	National Dairy Research Institute (ICAR-NDRI), Karnal, Haryana, India	2011

MEMBERSHIP

- Probiotic Association of India (Pai)

KEY PUBLICATIONS

- P R Chandhni, Diwas Pradhan, Kandukuri Sowmya, Sunny Gupta, Saurabh Kadyan, **Ritu Choudhary**, Gulati Ganga, Rashmi Hogarehalli Mallappa, Jai K Kaushik and Sunita Grover. **2021**. Ameliorative Effect of Surface Proteins of Probiotic Lactobacilli in Colitis Mouse Models. *Frontiers in Microbiology*. **175**.
- Kumar Siddarth Singh, **Ritu Choudhary**, Sonu Bisht, Sudarshan Kumar, Ashok Kumar Mohanty and Jai Kumar Kaushik. **2017**. Expression of recombinant truncated domains of mucus-binding (Mub) protein of *Lactobacillus plantarum* in soluble and biologically active form. *Protein expression and purification*. **135:54-60**
- Sonu Bisht, Kumar Siddarth Singh, **Ritu Choudhary**, Sudarshan Kumar, Ashok Kumar Mohanty and Jai Kumar Kaushik. **2017**. Expression of fibronectin-binding protein of *L. acidophilus* NCFM and in vitro refolding to adhesion capable native-like protein from inclusion bodies. *Protein expression and purification*. **135:54-60**

BOOKS:

BOOK CHAPTERS

- DNA structure and function. A series of life sciences books. *Springer nature* (under publication)

CONFERENCES

- **Ritu Choudhary** and J. K. Kaushik. **2021**. Recombinant surface layer protein of *Lactobacillus helveticus* inhibits the binding of enterotoxigenic *E. coli* to human intestinal cell line. "E-symposium on recent trend in biology organized by Charusat University, Changa, Gujarat"
- **Ritu Choudhary** and J. K. Kaushik. **2021**. Surface layer protein of probiotic *Lactobacillus acidophilus* NCFM prevents the Enterotoxigenic *E. Coli* adhesion to Caco-2 cells. "Virtual 22nd INDO-US Flow

Cytometry Workshop”

- **Ritu Choudhary** and J. K. Kaushik. **2019**. Probiotic recombinant adhesive surface layer protein prevents the binding of enteric pathogen to human intestinal cell line HT-29. "International Conference on Advances in Medical and Industrial Biotechnology”.
- **Ritu Choudhary**, Kumar Siddarth Singh, Sonu Bisht and Jai K. Kaushik. **2017**. Recombinant surface layer proteins of *Lactobacillus acidophilus* NCFM inhibits the adhesion of enterotoxigenic *E. coli* to the human intestinal cell line Caco-2. “International Conference on crystal ball vision on science and technology for societal upliftment”.
- **Ritu Choudhary** and Jai K Kaushik.**2016**. Purification and characterization of recombinant surface layer protein of probiotic lactic acid bacteria. Review – CAFT training programme on “Probiotics: The Therapeutics of 21st Century organized by ICAR.
- **Ritu Choudhary**, Kumar Siddarth Singh, Sonu Bisht and Jai K. Kaushik.**2016**. Host-microbial interaction: Role of surface proteins of probiotic lactic acid bacteria in binding with host. Review – CAFT training programme on “Probiotics: The Therapeutics of 21st Century organized by ICAR.
- **Choudhary, R.**, Singh, K. S., Bisht, S., Kaur, S., Grover, S., Kumar, S., Mohanty, A. K., Kaushik, J. K. **2016**. S-layer proteins of lactobacilli inhibits ETEC adhesion to the human intestinal cells and modulates innate immune response of mice immune cells. 3rd Biennial PAi Conference -51 (Young Investigator award – PAi conference and international symposium on Stress, Microbiome and Probiotics.
- **Choudhary, R., Singh, K.S.**, Kumar, S., Grover, S., Kaushik J.K. **2014**. Pathogen Exclusion by Surface Proteins: Interaction of recombinant surface layer protein of lactobacilli with human gut cell line and tissues. 2nd Annual Conference of Probiotic Association of India (PAi) and the International Symposium on “Probiotics and Microbiome: Gut and Beyond”
- Singh, K.S., **Choudhary, R.**, Kumar, S., Grover, S., Kaushik J.K. **2014**. Muco-adhesive potential in domains of mucus binding protein (Mub) of *Lactobacillus plantarum*. 2nd Annual Conference of Probiotic Association of India (PAi) and the International Symposium on “Probiotics and Microbiome: Gut and Beyond” Muco-adhesive potential in domains of mucus binding protein (Mub) of *Lactobacillus plantarum*

TRAINING AND CONFERENCES ATTENDED

- Project report on “**DNA Fingerprinting**” from **June 8th to August 13th, 2010** at DNA Division, Forensic Science Lab, Madhuban, Karnal, Haryana
- National Symposium on “**Recent advances in Reproductive Biotechnology: Retrospective and Prospective Vision**” **January 30-31, 2012** organized by Indian Society for the study of Reproduction & Fertility (ISSRF)
- International Workshop on “**Transcriptomics, Proteomics and Structural Biology**” organized by ABTC, NDRI and NBAGR, Karnal on February **27-29, 2012**
- Training on “**Computational Tools for Animal Genome Resource Data Analysis**” during **December 02-13, 2013** organized under NAIP subproject “Establishment of National Agricultural Bioinformatics Grid (NABG) in ICAR”
- 2nd Annual Conference of Probiotic Association of India (PAi) and the International Symposium on

“Probiotics and Microbiome: Gut and Beyond” at New Delhi on **November 3-4, 2014**

- **“National Workshop on Proteomics Structural Bioinformatics”** organized by The BTIS Sub-centre supported by Department of Biotechnology (DBT), Govt. of India on **March 23-25, 2015**
- 3rd Biennial PAi conference and International Symposium on **“Stress, Microbiome and Probiotics”** organized by PAi and NISER, Bhubaneswar on **March 11-13, 2016.**