Professorial Inaugural Lecture

A Journey From Microbiology to Biotechnology

By
Dr. Sangita Shakya, Ph.D.
Department of Biotechnology
Kathmandu University
July 23, 2024

Academic Qualification

Kathmandu University
Dhulikhel, Kavre, Nepal

Ph.D. in Biotechnology — **2014**

Anna University
(Chennai, India)

M. Tech. in Biotechnology (Distinction) — **2002**

Tribhuwan University
(Kirtipur, Nepal)

M. Sc. in Microbiology First Division — **1993**

Tribhuwan University
(Kirtipur, Nepal)

B. SC. in Microbiology First Division — **1991**

Kathmandu Valley Campus, (Lalitpur, Nepal)

I.SC. in Science First Division — **1988**

Dr. Sangita Shakya, Ph.D.
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Kathmandu University,
Dhulikhel, Kavre

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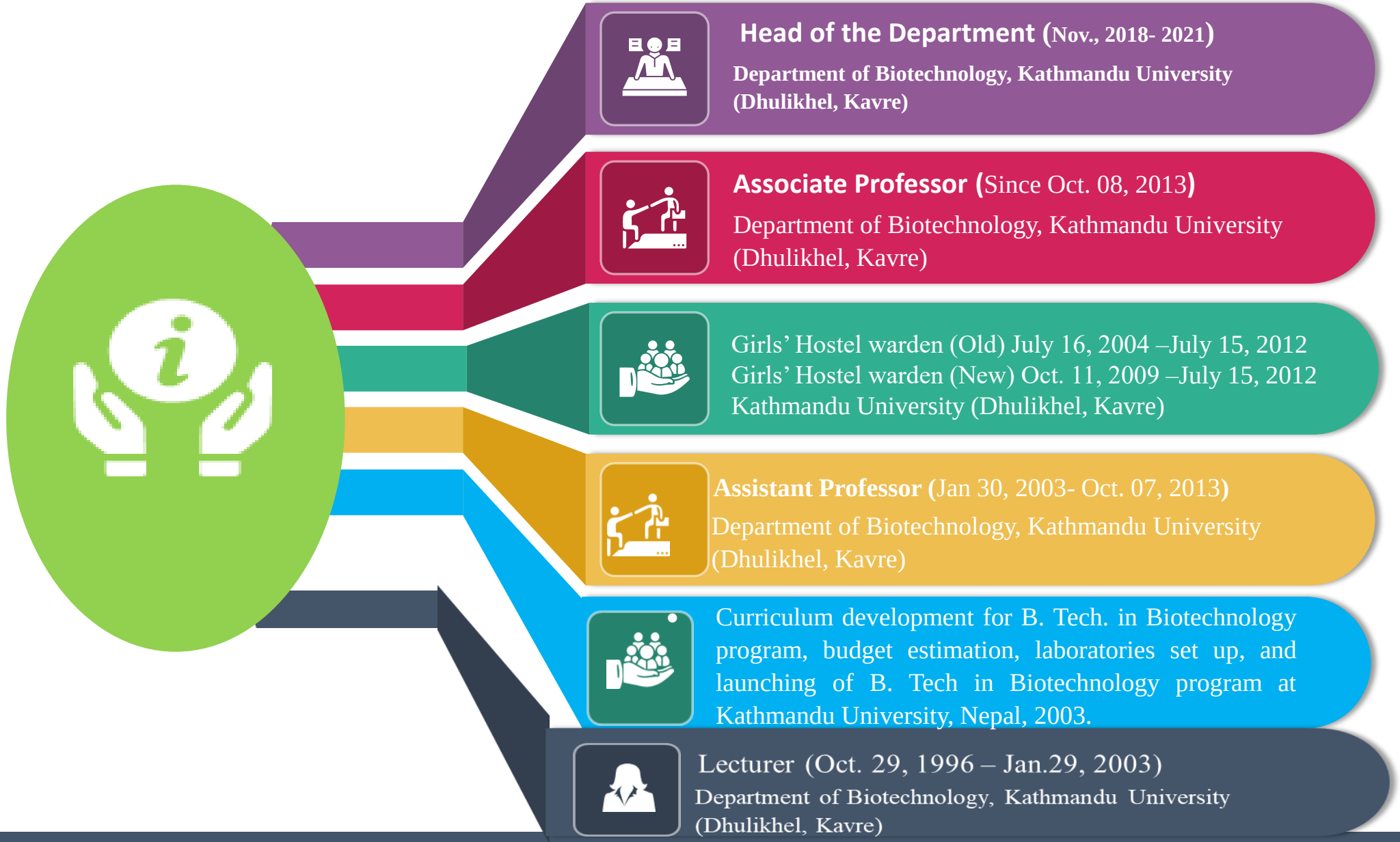
ROLES AND RESPONSIBILITIES

Service to the Profession and University



HONORS AND AWARDS

- First runner up in Best poster Award on Optimization of Polyhydroxybutyrate Production in Bacteria by Response Surface Methodology and Production in Molasses in The 3rd International Conference on Bioscience & Biotechnology (ICBB)
- Best Poster Award on Exploration of Bacteriophage for Biocontrol in the International Symposium on Gene Regulation To Genome Architecture

2020

2014

Rajatmahotsav Anabarat Sewa Padak, Kathmandu University, Dhulikhel, Kavre,

2014

Rastriya Vidya Bhusan Ka, Ministry of Education, Science and Technology, Government of Nepal, Kathmandu, Nepal.
Rajatmahotsav Anabarat Sewa Padak, Kathmandu University, Dhulikhel, Kavre

2009

National Education Award (Rastriya Sikchhya Puraskar),, Ministry of Education, Science and Technology, Government of Nepal, Kesar mahal, Kathmandu, Nepal.

2008

PhD Scholarship award from University Grant Commission (UGC), Sanothimi, Bhaktapur, Nepal.

GRANTS

B. Tech. in Biotechnology Program Launch, 2003

Financial support of Rs 2 crore (20 million)
Rs 50,00,000 per year for lab set up from Happy House Foundation, Sweden.

2007 AD — $2000

International Foundation for Science (IFS), Sweden

Microbiological assessment on arsenic enriched well water as environmental toxicant at Rautahat, Nepal"

2009 AD — $ 6575

World Wildlife Fund (WWF), Nepal

Feasibility Study for Ethanol Production from *Saccharum spontaneum*.

2010 AD — $12000

International Foundation for Science (IFS), Sweden

Acquisition of Arsenic Resistance Determinants in the Bacteria isolated from the Arsenic Enriched Water Sources Rautahat, Nepal.

2017 AD — Nrs 2,00,000

UGC Faculty Research Grant 2073-74 (Award No. FRG-73/74-S&T-12)

Microbial Biosynthesis of polyhydroxybutyrate (PHB) biopolymer and optimization of process parameters

2022 AD — $41,667

Kathmandu University- Integrated Rural Development Program Nepal Technology Innovation Center (KU-IRDP NTIC) grant funded by Korea International Cooperation Agency (KOICA) School Based Entrepreise (SBE) Project

Formulation of Probiotic as well as avocado enriched ice cream for health, School Based Entrepreises project.

RESEARCH EXPERIENCES

PhD Research

Assessment of Arsenic Contamination of Drinking Water sources and environmental microbial toxicity in Rautahat district, Nepal

M. Tech. Thesis

Expression of Early Nodulin Genes in the Nodulation Variants of Chickpea, Anna University, Chennai, India, 2002

Master's Thesis

Study on Lipolytic Activities of Fungi Isolated From Oil Mill Areas, Tribhuvan University, 1995.

Funded researches

- International Foundation for Science(IFS, Sweden) -2010
- World Wildlife Fund, Nepal – 2009
- International Foundation for Science (IFS, Sweden)-2007.

Funded Research 2022

Kathmandu University-Integrated Rural Development Program/Nepal Technology Innovation Center (KU-IRDP/NTIC) grant funded by Korea International Cooperation Agency (KOICA)

Publications as Associate Professor

2014

Shakya, S., Pradhan, B.

Characterization of *Dietzia natronolimnaea* ASO3 isolated from arsenic enriched water sources for its potential to arsenic resistance and removal. Journal of Institute of Medicine volume 36, Issue 1, pp 50-57.

2015

Upreti, D., Sapkota, N. P., Aryal, B., Shakya, S.

Accumulation of Poly hydroxybutyric acid (PHB) by Bacillus Strain Isolated from paddy field of Kathmandu University premises. Nepal Journal of Biotechnology, volume 3, Issue 1, pp 2-5

2017

Bista B., Shakya S.

Isolation of Arsenic Resistant *Escherichia coli* from Sewage Water and its Potential in Arsenic Biotransformation. The Journal of Tropical Life Science, volume 7, Issue 1, pp 66-71.

2021

Sangita Shakya Rosy Shakya

Optimization of Polyhydroxybutyrate Production by Bacteria Isolated from Solid Waste Transfer Station, Teku, Nepal Annals of R.S.C.B., ISSN 1583-6258, Vol. 25, Issue 4, pp 5308 – 5324

2021

Sangita Shakya Shreya Shrestha

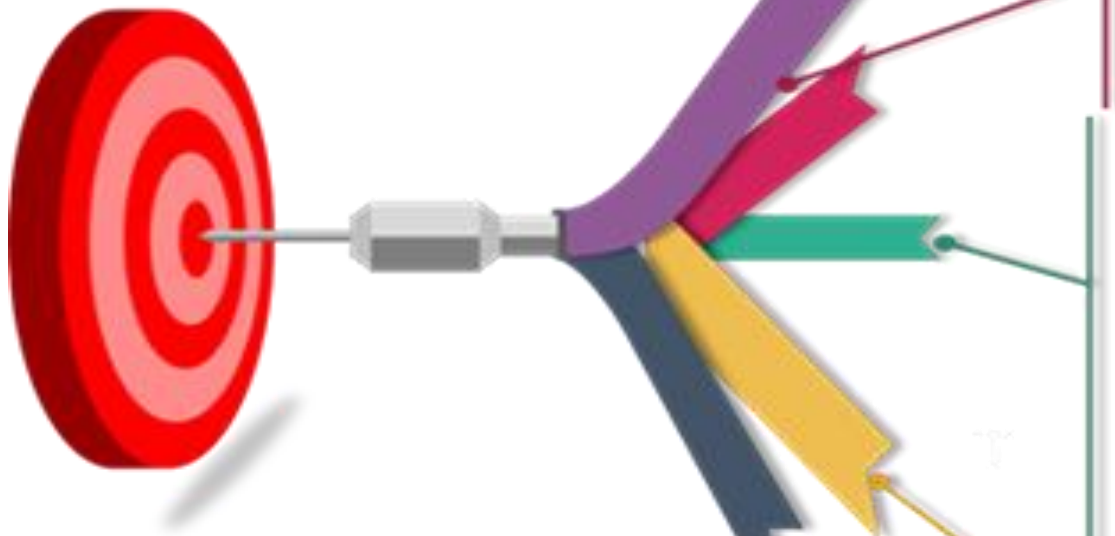
Screening and Optimization of Biopolyester Synthesis by Bacteria Isolated from Wastewater Treatment Plant, Guheshwori, Nepal, International Research Journal of Modernization in Engineering Technology & Science (IRJMETS) ISSN:2582-5208, Volume 3 Issue 5, May 2021

2024

Rekha Bhattarai, Nisha Karki, Sangita Shakya, Rabindra Prasad Dhakal and Pratibha Poudel

Potential application of biochar as a growth supplement for mushroom cultivation (*Pleurotus ostreatus*) DOI: https://doi.org/10.33545/26631067.2024.v6.i1a.181Int. J. Hortic. Food Sci., 2024; 6(1): 21-26

Achievements as Associate Professor



PhD Supervisor

Assessment of Anti-Virulence and Anti-Quorum Sensing (Qs) –Potential of Avocado on Bacteria, ongoing, **Ashna Dhakal**, PhD in Biotechnology, Department of Biotechnology- 2022

PhD Supervisor

Isolation and Application of Plastics Degrading Microorganisms ongoing **Shreekrishna Neupane**, PhD in Environmental science and engineering, Department of Environmental Science and Engineering - 2021

M. Tech. Thesis Supervision

- Preparation and Quality Evaluation of Avocado (*Persea Americana*) Ice Cream, 2022. Prabesh Tiwari, Master of Technology in Biotechnology, Kathmandu University, Dhulikhel, Nepal.
- Preparation of Biochars for their Application as a Soil Amendment, dye and heavy metal removal, 2022. Rekha Bhattarai, Master of Technology in Biotechnology, Kathmandu University, Dhulikhel, Nepal.
- Screening and evaluation of biopolyester synthesis by Bacteria isolated from wastewater treatment plant, Guheshwori, Nepal, 2019. Shreya Shrestha, Master of Technology in Biotechnology, Kathmandu University, Dhulikhel, Nepal.
- Production, optimization and characterization of Polyhydroxybutyrate by bacteria isolated from solid Waste transfer station, Teku, Nepal, 2019. Rosy Shakya, Master of Technology in Biotechnology, Kathmandu University, Dhulikhel, Nepal.

New Product

Bioplastic (PHB), Avocado enriched ice-cream

Probiotic Product

Probiotic ice- cream
Probiotic gel

Future Plan

PhD supervision

Add more PhD Scholars
(Enhance Research and Publication)

Enhance Academic Strength

- Grant application
- Patent filing and academic publication
- R &D in Bioproducts
- Collaboration

B. Tech./M. Tech. Project Supervision

(Research and Publication)

Faculty Lab. upgrade

(Microbial Biotechnology Research Lab.)

Other Goals

To serve University through administrative service

Production Unit Set up

To fulfill Product development through Factory Classroom Model

(Provided Proper Production Unit)

Strategic Plan for Innovation and employability in Department of Biotechnology

- **Curriculum Enhancement** : Expand programs in different specialized fields of biotechnology. Introduce interdisciplinary courses, project-based learning, and industry collaborations to foster innovation.

- **Infrastructure Development:** Infrastructure upgrades to ensure that student researchers have access to modern research facilities and technology.

- **Center for Biotech Advocacy:**

Center for Careers, Innovation and Entrepreneurship
Conduct advocacy for creating/facilitating job opportunities.
Understand the requirements of industries related to the specialization (skill demand and market trend)
Policy and guideline development and regulation

- **Entrepreneurship Initiatives:** Establish incubation centers, startup competitions, and mentorship programs to nurture entrepreneurial skills.
- Be a technical resource for biotechnology researchers at Kathmandu University and across the region.

- **Research and development:** Encourage faculty and student research in emerging fields relevant to industry demands via Academic- Industry and Government Interface to develop and establish as Centre of Excellence

- **Skill Development Programs:** Implement skill enhancement programs, workshops, and internships to bridge the employability gap. Promote suitable Training, Value Added Certification Courses and Beyond Syllabus Academics for capacity building to face competitions and placements.

To make the most reputed center of study and research in its disciplinary domain in the country while making it well known globally

Activities- Project Avocado ice cream

REMINISCENCES

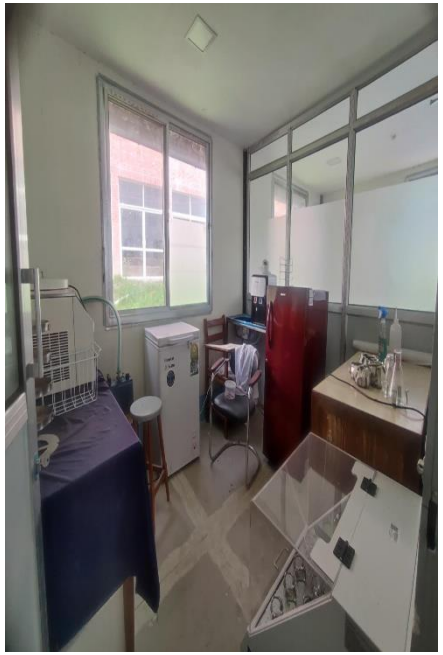
THE ICE CREAM TEAM

L-R Anjali Gaihre (Research Assistant), Ashna Dhakal (Co-investigator), Prakriti Baral (Research Assistant), Dr. Sangita Shakya (Principal Investigator)

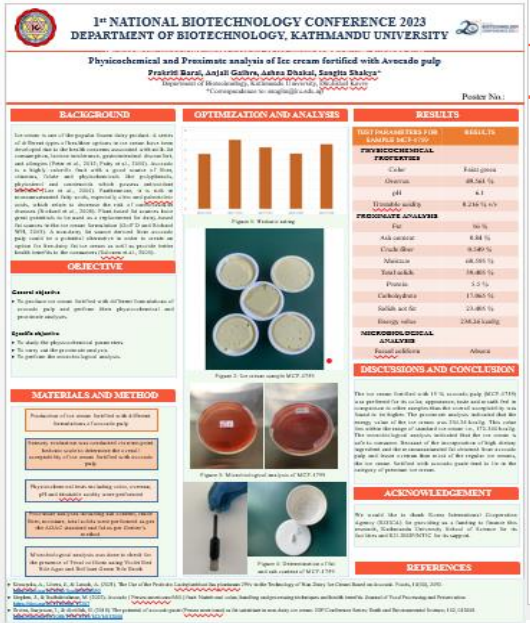
Activities- Project Avocado ice cream






Techno Fair 2023 - Showcasing research and development outcomes

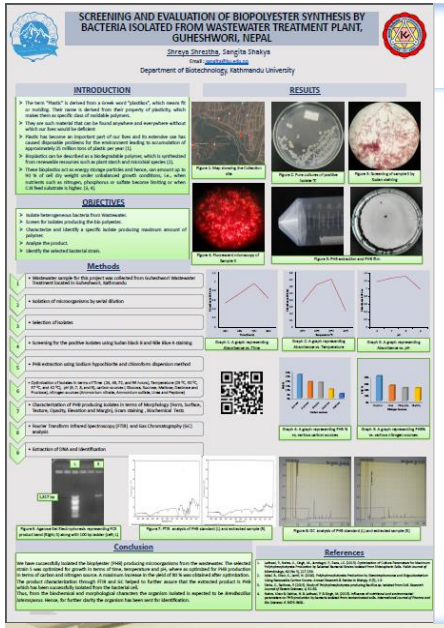


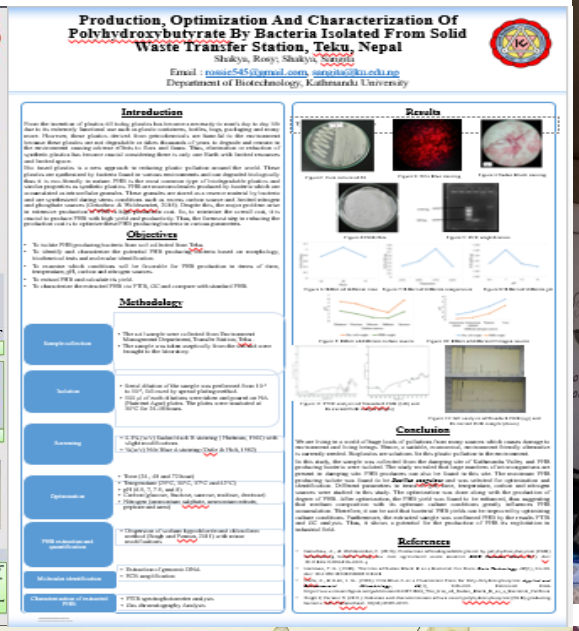
Research Capacity Development Training- South Korea/ Nepal

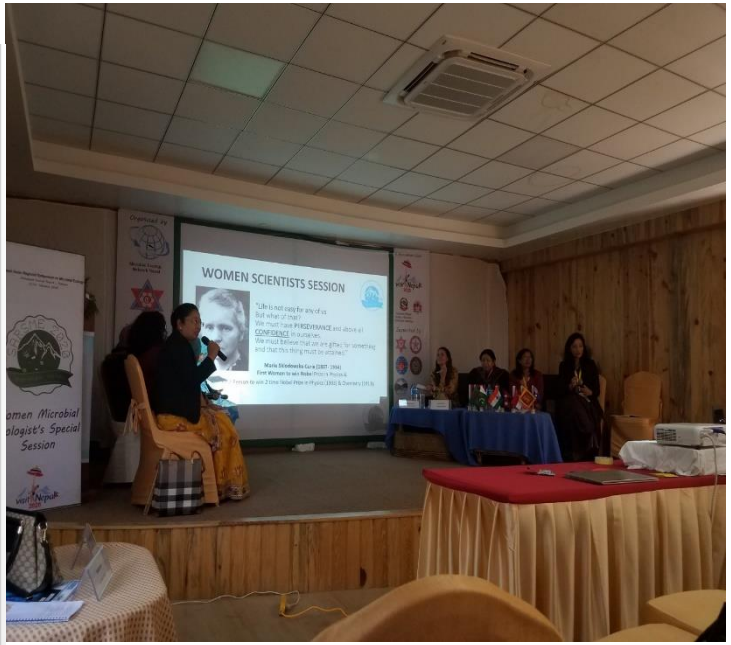
Probiotic Encapsulation

Avocado Ice - cream

Activities – Project Bioplastic Production








THANK YOU