

# PALNI KUNDRA

Biotechnology, Microbiology, Microbiome, Food Science



## PERSONAL STATEMENT

Driven by scientific curiosity and a commitment to innovation, I leverage my multidisciplinary background from renowned universities to conduct cutting-edge research. My expertise in food science, microbiology, and nutrition, combined with leadership skills and analytical prowess, equips me to design and execute impactful studies. With a track record of peer-reviewed publications in high-impact journals, I have demonstrated my ability to contribute significant findings to the scientific community. I am dedicated to advancing scientific knowledge and developing health-promoting solutions through rigorous, creative research approaches.



## KEY COMPETENCIES

- Possess in-depth knowledge across various scientific disciplines, including food science, microbiology, nutrition, gastroenterology, probiotics, biotechnology and biology.
- Proficient in translating complex scientific concepts into clear, engaging content, as well as translating scientific findings into actionable next steps.
- Proficient in designing, implementing, and executing research projects, encompassing laboratory techniques, statistics and bioinformatics.
- Proven ability to collaborate effectively with internal and external teams.



## EDUCATION

- |                   |  |                       |
|-------------------|--|-----------------------|
| 2018<br> <br>2023 | ● <b>ETH Zurich</b><br>Doctorate (PhD, Dr. sc.)<br><b>Supervisor:</b> Prof. Dr. Christophe Lacroix   | 📍 Zurich, Switzerland |
| 2016<br> <br>2018 | ● <b>McGill University</b><br>Masters of Science (M.Sc.)<br><b>Supervisor:</b> Prof. Jennifer Ronholm<br><b>CGPA:</b> 3.87/ 4  | 📍 Montréal, Canada    |
| 2011<br> <br>2015 | ● <b>Guru Nanak Dev University</b><br>Bachelor of Food Science and Technology<br><b>Advisor:</b> Prof. Bhartendu Singla<br><b>CGPA:</b> 8.7/ 10 ( <i>Gold medalist</i> ) | 📍 Amritsar, India     |



## WORK AND RESEARCH EXPERIENCE

- |                           |  |                       |
|---------------------------|--|-----------------------|
| Sep 2018<br> <br>Jun 2023 | ● <b>Scientific Assistant</b><br>ETH Zurich<br><b>Supervisor:</b> Prof. Dr. Christophe Lacroix | 📍 Zurich, Switzerland |
|---------------------------|--|-----------------------|
- Completed a multi-year research project investigating the modulatory potential of dietary and gut-microbially produced vitamin B9 and B12 on the complex gut microbiota, as well as on single next generation probiotic gut microbes.
  - Led the planning and execution of laboratory experiments, developed experimental and analytical methods (UHPLC-UV/MS), and analyzed metagenomic and other data types.
  - Completed project deliverables by preparing research findings for publication in scientific journals.
  - Presented research findings at scientific conferences, effectively communicating complex scientific concepts to diverse audiences.
  - Mentored Bachelor's and Master's students throughout their thesis projects, and facilitated a semester laboratory course, enhancing hands-on learning experiences.



## AWARDS AND MEDALS

**Gold medal** (Bachelor Studies)  
University topper 2015

**Poster presentation award**  
Second prize, Green tea ice cream  
Presented at science exhibition  
2015

## COMPUTATIONAL SKILLS

**Bioinformatics skills:**  
metagenomic data analysis  
**Programming:** R, Bash  
**Version control:** git  
**Project management:** GitHub

## LANGUAGES

English (Native, C1)  
German (Written A2, spoken B1)  
Hindi (Native)  
Punjabi (Native)

## CONTACT INFO

✉ [palnikundra@gmail.com](mailto:palnikundra@gmail.com)  
☎ +41 77 993 58 99

## MORE INFO

🆔 0000-0002-8999-6451  
in [palnikundra](#)  
📷 [Palni Kundra](#)  
R<sup>6</sup> [Palni\\_Kundra](#)  
🌐 [pkundra](#)

May-Sep 2017	<b>Graduate research project</b> McGill University <div> <span>📍</span> Montréal, Canada         </div> <ul style="list-style-type: none"> <li>• <b>Supervisor:</b> Prof. Jennifer Ronholm</li> <li>• Conducted whole-genome SNP-based analysis to identify changes under laboratory conditions in major foodborne pathogens responsible for global outbreaks.</li> <li>• Provided support for preparing the manuscript for publication.</li> </ul>
Jan-Feb 2015	<b>Student research assistant</b> Guru Nanak Dev University <div> <span>📍</span> Amritsar, India         </div> <ul style="list-style-type: none"> <li>• <b>Supervisor:</b> Prof. Pankaj Gupta</li> <li>• Developed an innovative food product - Green tea ice cream.</li> <li>• Performed sensory and organoleptic evaluation.</li> <li>• Presented the product at scientific conference.</li> </ul>
Jul 2014   Mar 2015	<b>Student research assistant</b> Guru Nanak Dev University <div> <span>📍</span> Amritsar, India         </div> <ul style="list-style-type: none"> <li>• <b>Supervisor:</b> Prof. Bhartendu Singla</li> <li>• Developed various innovative soy-based food products to enhance gluten-free product.</li> </ul>
May-Jun 2013	<b>Research internship</b> Indian Council of Agricultural Research <div> <span>📍</span> Ludhiana, India         </div> <ul style="list-style-type: none"> <li>• <b>Supervisor:</b> Dr. Pranita Jaiswal</li> <li>• Applied a non-destructive quality control approach to develop spectrophotometric method for the detection of Soy-milk adulteration in cow milk.</li> <li>• Performed spectrophotometer analysis.</li> </ul>
Jun 2013 & Jul 2014	<b>Industrial internship</b> Markfed Canneries <div> <span>📍</span> Jalandhar, India         </div> <ul style="list-style-type: none"> <li>• Performed microbiological testing and applied quality control assurance techniques.</li> </ul>
Jun-Jul 2013	<b>Industrial internship</b> Verka Milk plant <div> <span>📍</span> Jalandhar, India         </div> <ul style="list-style-type: none"> <li>• Performed microbiological testing and applied quality control assurance techniques.</li> </ul>



## SCIENTIFIC PUBLICATIONS

### Peer-reviewed Publications

**Palni Kundra**, Anna Greppi, Monica Duppenhaler, Serafina Plüss, Benoit Pugin, Christophe Lacroix, Annelies Geirnaert. Vitamin B12 analogues from gut microbes and diet differentially impact commensal propionate producers of the human gut. **2024**. *Frontiers in Nutrition*. doi: [10.3389/fnut.2024.1360199](https://doi.org/10.3389/fnut.2024.1360199)

**Palni Kundra**, Annelies Geirnaert, Benoit Pugin, Paola Morales Martinez, Christophe Lacroix, Anna Greppi. Healthy adult gut microbiota sustains its own vitamin B12 requirement in an in vitro batch fermentation model. **2022**. *Frontiers in Nutrition*. doi: [10.3389/fnut.2022.1070155](https://doi.org/10.3389/fnut.2022.1070155)


**Palni Kundra**, Carole Rachmühl, Christophe Lacroix, Annelies Geirnaert. Role of dietary micronutrients on gut microbial dysbiosis and modulation in inflammatory bowel disease. **2021**. *Molecular Nutrition & Food Research*. doi: [10.1002/mnfr.201901271](https://doi.org/10.1002/mnfr.201901271)

Nicholas Petronella, **Palni Kundra**, Olivia Auclair, Karine Hébert, Mary Rao, Kyle Kingsley, Katrien De Bruyne, Swapna Banerjee, Alexander Gill, Franco Pagotto, Sandeep Tamber, Jennifer Ronholm. Changes detected in the genome sequences of *Escherichia coli*, *Listeria monocytogenes*, *Vibrio parahaemolyticus*, and *Salmonella enterica* after serial subculturing. **2019**. *Canadian Journal of Microbiology*. doi: [10.1139/cjm-2019-0235](https://doi.org/10.1139/cjm-2019-0235)

**Palni Kundra**, Annelies Geirnaert, Benoit Pugin, Serafina Plüss, Susanna Kariluoto, Christophe Lacroix, Anna Greppi. Effect of microbially-produced vitamin B9 on the growth and metabolism of human gut microbes. **2024**. submitted to *BMC microbiology*.

## THESES

Jun 2023

- **Doctor of Sciences**  
**Palni Kundra**, 2023. Dr. sc. Thesis. The effect of exogenous and endogenous vitamin B9 and B12 on microbial growth and metabolism in the human gut.  [10.3929/ethz-b-000641198](https://doi.org/10.3929/ethz-b-000641198)

Jan 2018

- **Master of Science**  
**Palni Kundra**, 2018. M.Sc. Research project. Single Nucleotide Polymorphisms in major food-borne pathogens.

## MENTORING

### ● Master projects at ETH Zurich

**Monica Duppenthaler** Vitamin B9 and B12 driven trophic interactions in the human gut. *Master in Food Science*. Jul 2021 - Jan 2022 (Thesis)

**Janik Mutter** Vitamin B9 production and cross feeding among human gut microbial strains. *Master in Biology*. Mar 2021 - Jul 2021 (Research project)

### ● Bachelor thesis projects at ETH Zurich

**Sabina Galli** B-vitamin bio-factory in the gut: In-vitro vitamin B9 production and utilization by human gut microbes. *Bachelor in Food Science*. Jul 2022 - Oct 2022

**Sara De Crescenzo** In-vitro Vitamin B12 Production by Human Gut Bacteria. *Bachelor in Food Science*. Jul 2021 - Oct 2021

**Giuliano Menegon** B-vitamin sharing: In-silico and in-vitro study to determine B9 and B12 cross-feeding between human gut microbial strains. *Bachelor in Food Science*. Jun 2020 - Nov 2020

**Lucie Kuhn** Give them vitamins: Impact of B9 and B12 on the acetate and butyrate production on human gut microbes. *Bachelor in Food Science*. Nov 2019 - Feb 2020

**Blandine Genet** Give them vitamins: Impact of B9 and B12 on the butyrate and propionate production on human gut microbes. *Bachelor in Food Science*. Jun 2019 - Sep 2019

## TEACHING

2019  
-  
2022

- **752-5004-00L: Food Biotechnology Laboratory Course**  
ETH Zurich  Zurich, Switzerland  
Main responsible for cheese practical (2019 & 2020) and sour dough bread practical (2021 & 2022).

Semester course


## ORAL AND POSTER PRESENTATIONS

Sep  
2021

- **Human Gut Microbial Strains Produce Vitamin B12**  
6<sup>th</sup> International Vitamin Conference  Denmark


Oral & Poster

Jul  
2021

- **In-Vitro Vitamin B12 Production by Human Gut Microbial Strains**  
ANAEROBE 2021: THE MICROBIOTA AND BEYOND  Online

Poster

Feb  
2015

- **Development of soy-based product and their organoleptic evaluation**  
Advances in agricultural Science & biotechnology, *DAV College Jalandhar*  India

Poster

Jan  
2015

- **"Green tea ice cream"**  
Science exhibition, *DAV College Jalandhar*  India



## WORKSHOPS/ COURSES (NOT ON TRANSCRIPTS)

- 2023

● **PMDA Summer School**  
 Roche 📍 Basel, Switzerland  
 Predictive modelling and data analytics summer school to solve problems in drug discovery and development.

- 2022

● **Project Management for research – for doctoral students**  
 ETH Zurich 📍 Zurich, Switzerland  
 Project risk management, project management.

- 2021

● **Scientific poster design**  
 University of Zurich 📍 Zurich, Switzerland  
 content structure, typography do's and don'ts, design principles, design grids, design tools, image editing, perception, color theory.

- 2021

● **Energy and stress management: How to perform in the storm**  
 University of Zurich 📍 Zurich, Switzerland  
 Energy management, understand obstacles and overcome them, achieve targeted change.

- 2021

● **Time and self management for PhD Candidates**  
 ETH Zurich 📍 Zurich, Switzerland  
 Assess habits, values, goals, energy, and time management techniques.

- 2021

● **Leadership skills for PhD Candidates**  
 University of Zurich 📍 Zurich, Switzerland  
 Management, leadership, needs analysis, behavior, destructive leadership, and case studies.

- 2020

● **Statistics for Experimental Research**  
 ETH Zurich 📍 Zurich, Switzerland  
 Experimental designs, statistical analyses using R, report analyses and results in a scientifically appropriate manner.

- 2018

● **Mass spectrometry-based metabolomics - from theory to practice**  
 Functional Genomics Center of University and ETH Zurich 📍 Zurich, Switzerland  
 Metabolomics overview, and data analysis and interpretation.

- 2017

● **Introduction to genomic analysis**  
 Compute Canada & University of British Columbia 📍 (Online) Canada  
 UNIX programming, alignment, Variant calling and annotation, data visualization, and RNA-Seq including statistical analysis.

- 2014

● **36<sup>th</sup> Post-harvest technology - short course**  
 University of California, Davis 📍 Davis, USA  
 Advanced Crops handling and harvesting systems.

verleiht

**Palni Kundra**

Master of Science, McGill University  
geboren am 30. November 1991

den Titel

**DOKTORIN DER WISSENSCHAFTEN**

aufgrund der Doktorarbeit

THE EFFECT OF EXOGENOUS AND ENDOGENOUS VITAMIN B9 AND B12  
ON MICROBIAL GROWTH AND METABOLISM IN THE HUMAN GUT

Leiter der Doktorarbeit: Prof. em. Dr. Christophe Lacroix

und der mündlichen Prüfung vom 21. Juni 2023

Zürich, 27. November 2023

Der Rektor



Prof. Dr. Günther Dissertori

Die Vorsteherin des Departements  
Gesundheitswissenschaften und Technologie



Prof. Dr. Laura Nyström







McGILL UNIVERSITY  
MONTREAL

TO ALL TO WHOM THESE PRESENTS MAY COME, GREETING:  
WE, THE GOVERNORS, PRINCIPAL, AND FELLOWS OF MCGILL UNIVERSITY TESTIFY THAT

*Palni Kundra*

HAVING DILIGENTLY COMPLETED THE REQUIRED COURSE OF STUDY AND PERFORMED  
THE PRESCRIBED EXERCISES HAS BEEN ADMITTED TO THE DEGREE OF

MASTER OF SCIENCE

WITH ALL THE HONOURS, PRIVILEGES, AND PREROGATIVES PERTAINING TO THAT DEGREE, IN WITNESS  
WHEREOF WE HAVE AFFIXED OUR SIGNATURES AND HAVE CAUSED THE SEAL OF THE UNIVERSITY TO BE  
ATTACHED HERETO. GIVEN IN CONVOCATION THIS 6TH DAY OF JUNE IN THE YEAR 2018.

DEAN

REGISTRAR



CHANCELLOR

PRINCIPAL





# ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ



ਬੈਚੁਲਰ ਆਫ ਫੂਡ ਸਾਇੰਸ ਐਂਡ ਟੈਕਨੋਲੋਜੀ (ਆਨਰਜ਼)

ਰਜਿਸਟਰਡ ਨੰ : 2011.ਜੇ/ਏ.37

Regd. No. : 2011J/A.37

ਰੋਲ ਨੰ. ] 92015036408  
Roll No.

ਪ੍ਰਮਾਣਿਤ ਕੀਤਾ ਜਾਂਦਾ ਹੈ ਕਿ ਪਲਨੀ ਕੁੰਦਰਾ ਪੁੱਤਰ/ਪੁੱਤਰੀ ਸ਼੍ਰੀ ਕਿਰਨ ਕਿਸ਼ੋਰ ਕੁੰਦਰਾ  
ਅਤੇ ਸ਼੍ਰੀਮਤੀ ਦਿਵਿਆ ਕੁੰਦਰਾ ਨੇ ਡੀ.ਏ.ਵੀ.ਕਾਲਜ, ਜਲੰਧਰ  
ਤੋਂ ਨਿਸ਼ਚਿਤ ਕੋਰਸ ਦਾ ਅਧਿਐਨ ਕਰਨ ਉਪਰੰਤ ਅਪ੍ਰੈਲ, 2015 ਵਿਚ ਹੋਈ ਲੋੜੀਂਦੀ ਪ੍ਰੀਖਿਆ ਪਹਿਲੀ (ਵਿਸ਼ੇਸ਼ਤਾ ਸਹਿਤ) ਡਿਵੀਜ਼ਨ ਵਿਚ ਪਾਸ ਕਰਕੇ  
ਬੈਚੁਲਰ ਆਫ ਫੂਡ ਸਾਇੰਸ ਐਂਡ ਟੈਕਨੋਲੋਜੀ (ਆਨਰਜ਼) ਦੀ ਡਿਗਰੀ ਪ੍ਰਾਪਤ ਕੀਤੀ ਹੈ।

**Guru Nanak Dev University**

**BACHELOR OF FOOD SCIENCE & TECHNOLOGY (HONOURS)**

This is to certify that PALNI KUNDRA son/daughter of Mr. KIRAN KISHORE KUNDRA  
and Mrs. DIVYA KUNDRA and of the D. A. V. COLLEGE, JALANDHAR  
having pursued the prescribed course of study and passed the requisite Examination, held in APRIL, 2015 has been admitted to the Degree of  
BACHELOR OF FOOD SCIENCE & TECHNOLOGY (HONOURS) and been placed in First Division (with Distinction).

ਯੂਨੀਵਰਸਿਟੀ ਸੀਲ ਅਧੀਨ ਪ੍ਰਮਾਣਿਤ ਕੀਤੀ ਗਈ।

Given under the seal of the University.

ਪ੍ਰੋਫੈਸਰ ਇੰਚਾਰਜ (ਪ੍ਰੀਖਿਆਵਾਂ)  
Professor Incharge (Exams.)  
ਅੰਮ੍ਰਿਤਸਰ ] June 17, 2015  
Amritsar

ਰਜਿਸਟਰਾਰ  
Registrar

ਵਾਈਸ-ਚਾਂਸਲਰ  
Vice-Chancellor

ਚਾਂਸਲਰ  
Chancellor



Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich

Institute of Food, Nutrition and Health  
Department of Health Sciences and Technology

ETH Zurich  
**Prof. Dr. Christophe Lacroix**  
Head, Laboratory of Food Biotechnology  
ETH Zentrum LFV C 20  
Schmelzbergstrasse 7  
CH-8092 Zürich, Switzerland

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christophe.lacroix@hest.ethz.ch  
www.fbt.ethz.ch

Zurich, 20 July 2023 LC

#### Letter of reference

Palni Kundra, born on November 30, 1991 and a citizen of Indien, was 100.00 % employed by ETH Zurich as doctoral student from September 1, 2018 until June 30, 2023. About 30,000 people from more than 120 countries study, carry out research and work at ETH Zurich.

Ms Palni Kundra's duties and responsibilities in this capacity primarily comprised:

- working on her own thesis in the specialist field of Food Biotechnology on the subject of modulation effects of B-vitamins on the human gut microbiota
- publishing her research results in the form of papers, conference papers, articles for books
- publishing her research results in the form of papers in recognised specialist journals
- presenting papers at academic conferences
- supervising students writing semester papers and/or Master theses
- guiding Bachelor students during exercise and practical sessions
- supervising Master students during practical work in the laboratory/institute/field

Palni Kundra possessed proven expertise and extensive experience in her area of responsibility. She successfully applied herself to new duties and used the acquired knowledge with good results. The effort she put into her work was in proportion to the achieved outcome, and she met the requirements. With her rational and precise approach to her work, she always delivered a good performance. Her good command of languages was of great value for the communication in her work environment.

Palni Kundra showed initiative and complete commitment. Under challenging conditions, she remained calm and assured, adapting to changing circumstances with ease. Perceptive in evaluating the scope and impact of her actions, she was careful when weighing up the related risks and opportunities. In the decision-making process she exercised autonomy blended with a great deal of expertise. When arranging the deployment of staff, she was good at doing so according to need and objective. It was important to her to align her outlook and her actions with the goals of Food Biotechnology.



## Letter of reference

Palni Kundra immediately conveyed key information to the relevant recipients, and chose the appropriate moment to involve management when the situation demanded it. In terms of verbal and writing skills, she displayed tremendous adroitness when tailoring her communications to her addressees. Moreover, she was adept at presenting her own ideas in a convincing manner. She took on board other opinions and constructive criticism; she listened to what was said and was tuned in to the needs of her conversational partners. She supported and encouraged collaboration within the team and was highly adept at reconciling differing views. Management, staff and students alike appreciated her greatly and held her in high esteem.

Palni Kundra left us on expiry of her fixed-term employment contract. We thank her for her contribution and wish her every success going forward.



Christophe Lacroix



Cynthia Kumin

## List of Referees:

- **Prof. em. Dr. Ing. Christophe Lacroix (PhD thesis Supervisor and Thesis committee)**  
Full professor and group leader at Food Biotechnology group  
Department of Health Science and Technology  
ETH Zurich  
  
Email: [christophe.lacroix@hest.ethz.ch](mailto:christophe.lacroix@hest.ethz.ch)
- **Dr. Annelies Geirnaert (Co-supervisor and Thesis Committee)**  
Senior Scientist at Food Biotechnology group  
Department of Health Science and Technology  
ETH Zurich  
  
Email: [annelies.geirnaert@hest.ethz.ch](mailto:annelies.geirnaert@hest.ethz.ch)
- **Dr. Anna Greppi (Co-supervisor and Thesis Committee)**  
Senior Scientist at Food Systems Biotechnology  
Department of Health Science and Technology  
ETH Zurich  
  
Email: [anna.greppi@hest.ethz.ch](mailto:anna.greppi@hest.ethz.ch)