

# 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 in gut health innovation. My Ph.D. expertise in gut microbial biotechnology, combined with strong analytical skills and a collaborative approach, equips me to design and execute impactful studies on complex biological systems. With a track record of peer-reviewed publications demonstrating my research, I bring a deep understanding of gut biology and microbial ecosystems and their interactions with host health. I am passionate about developing advanced in vitro models to better understand intestinal inflammation and contribute to the development of novel therapeutic strategies.



## 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 | <ul style="list-style-type: none"><li>● <b>ETH Zurich</b><br/>Doctorate (PhD, Dr. sc.)<br/><b>Supervisor:</b> Prof. Dr. Christophe Lacroix</li></ul>  | 📍 Zurich, Switzerland |
| 2016<br> <br>2018 | <ul style="list-style-type: none"><li>● <b>McGill University</b><br/>Masters of Science (M.Sc.)<br/><b>Supervisor:</b> Prof. Jennifer Ronholm<br/><b>CGPA:</b> 3.87/ 4</li></ul>  | 📍 Montréal, Canada    |
| 2011<br> <br>2015 | <ul style="list-style-type: none"><li>● <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>)</li></ul> | 📍 Amritsar, India     |



## WORK AND RESEARCH EXPERIENCE

- |                           |   |                       |
|---------------------------|---|-----------------------|
| Sep 2018<br> <br>Jun 2023 | <ul style="list-style-type: none"><li>● <b>Scientific Assistant</b><br/>ETH Zurich<br/><b>Supervisor:</b> Prof. Dr. Christophe Lacroix<ul style="list-style-type: none"><li>• 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.</li><li>• Led the planning and execution of laboratory experiments, developed experimental and analytical methods (UHPLC-UV/MS), and analyzed metagenomic and other data types.</li><li>• Completed project deliverables by preparing research findings for publication in scientific journals.</li><li>• Presented research findings at scientific conferences, effectively communicating complex scientific concepts to diverse audiences.</li><li>• Mentored Bachelor's and Master's students throughout their thesis projects, and facilitated a semester laboratory course, enhancing hands-on learning experiences.</li></ul></li></ul> | 📍 Zurich, Switzerland |
|---------------------------|---|-----------------------|



## 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

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## MORE INFO

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in [palnikundra](#)  
📷 [Palni Kundra](#)  
℞ [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.