

# PALNI KUNDRA

Biotechnology, Food Science, Nutrition, Vitamins, Microbiome



## PERSONAL STATEMENT

As a Ph.D. graduate from the Laboratory of Food Biotechnology at ETH Zurich, I offer extensive experience in developing and applying advanced analytical methods for detection and quantification of novel molecules. My research experience in developing LC-MS based analytical methods to detect and quantify vitamin B9 and B12 production by gut microbiota has strengthened my abilities in setting up experimental designs, sample preparation protocols, data analysis, and transforming scientific findings into practical insights. With a diverse background in food science, microbiology, and biotechnology, I am eager to apply my analytical skills and scientific curiosity to drive innovation in ingredient authenticity and quality control for the flavors and fragrances industry.



## 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 (Ph.D., 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

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## MORE INFO

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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 Duppenhaler** 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.