PALNI KUNDRA

Biotechnology, Food Science, Microbiology, Nutrition, Vitamins, Metabolomics

PERSONAL STATEMENT

As a Ph.D. graduate from ETH Zurich, I bring expertise in microbial metabolism and advanced analytical techniques. I am skilled in developing and optimizing methods for metabolite quantification using UHPLC-UV/MS in complex biological samples. I have extensive experience in analyzing metabolic pathways and interpreting diverse datasets, including metagenomic data. Throughout my career, I have successfully led research projects, mentored junior scientists, and collaborated effectively in multidisciplinary environments. I am eager to apply my analytical expertise and interdisciplinary background to advance research in metabolic disorders, particularly focused on understanding complex metabolic pathways and their clinical implications.

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 | 2023

ETH Zurich
Doctorate (Ph.D., Dr. sc.) — Zurich, Switzerland
Supervisor: Prof. Dr. Christophe Lacroix

2016 | 2018

McGill University
Masters of Science (M.Sc.) — Montréal, Canada
Supervisor: Prof. Jennifer Ronholm
CGPA: 3.87/ 4

2011 | 2015

Guru Nanak Dev University
Bachelor of Food Science and Technology — Amritsar, India
Advisor: Prof. Bhartendu Singla
CGPA: 8.7/ 10 (*Gold medalist*)

WORK AND RESEARCH EXPERIENCE

Sep 2018 | Jun 2023

Scientific Assistant
ETH Zurich — Zurich, Switzerland

- **Supervisor:** Prof. Dr. Christophe Lacroix
- 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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May-Sep 2017

Graduate research project
McGill University — Montréal, Canada
- **Supervisor:** Prof. Jennifer Ronholm
- Conducted whole-genome SNP-based analysis to identify changes under laboratory conditions in major foodborne pathogens responsible for global outbreaks.
- Provided support for preparing the manuscript for publication.

Jan-Feb 2015

Student research assistant
Guru Nanak Dev University — Amritsar, India
- **Supervisor:** Prof. Pankaj Gupta
- Developed an innovative food product - Green tea ice cream.
- Performed sensory and organoleptic evaluation.
- Presented the product at scientific conference.

Jul 2014 | Mar 2015

Student research assistant
Guru Nanak Dev University — Amritsar, India
- **Supervisor:** Prof. Bhartendu Singla
- Developed various innovative soy-based food products to enhance gluten-free product.

May-Jun 2013

Research internship
Indian Council of Agricultural Research — Ludhiana, India
- **Supervisor:** Dr. Pranita Jaiswal
- Applied a non-destructive quality control approach to a develop spectrophotometeric method for the detection of Soy-milk adulteration in cow milk.
- Performed spectrophotometer analysis.

Jun 2013 & Jul 2014

Industrial internship
Markfed Canneries — Jalandhar, India
- Performed microbiological testing and applied quality control assurance techniques.

Jun-Jul 2013

Industrial internship
Verka Milk plant — Jalandhar, India
- Performed microbiological testing and applied quality control assurance techniques.

SCIENTIFIC PUBLICATIONS

Peer-reviewed Publications

Palni Kundra, Annelies Geirnaert, Benoit Pugin, Serafina Plüss, Susanna Kariluoto, Christophe Lacroix, Anna Greppi. Microbially-produced folate forms support the growth of Roseburia intestinalis but not its competitive fitness in fecal batch fermentations. **2024**. *BMC microbiology*. doi: 10.1186/s12866-024-03528-6

Palni Kundra, Anna Greppi, Monica Duppenthaler, 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

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

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

Nicholas Petronella, **Palni Kundra**, Olivia Auclair, Karine Hébert, Mary Rao, Kyle Kingsley, Katrien De Bruyne, Swapan 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

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. doi: 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** — Semester course
ETH Zurich — Zurich, Switzerland
Main responsible for cheese practical (2019 & 2020) and sour dough bread practical (2021 & 2022).

ORAL AND POSTER PRESENTATIONS

Sep 2021 — **Human Gut Microbial Strains Produce Vitamin B12** — Oral & Poster
6th International Vitamin Conference — Denmark

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

Feb 2015 — **Development of soy-based product and their organoleptic evaluation** — Poster
Advances in agricultural Science & biotechnology, *DAV College Jalandhar* — India

Jan 2015 — **“Green tea ice cream”** — Poster
Science exhibition, *DAV College Jalandhar* — India

WORKSHOPS/ COURSES (NOT ON TRANSCRIPTS)

2024 **Interpretation and Application of ICH E6(R2) by Multi-Regional Clinical Trails (MRCT)**
The MRCT Center of Brigham and Women's Hospital and Harvard (Online), Switzerland

2024 **A practical introduction to bioinformatics and RNA-seq using Galaxy**
Galaxy Training Network (Online), Switzerland
Sequencing, quality control and reference based mapping, Differential gene expression, DESeq2, Bioinformatic and RNA-seq data analysis on Galaxy Platform.

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 **36th Post-harvest technology - short course**
University of California, Davis Davis, USA
Advanced Crops handling and harvesting systems.