

Bhawani Chamlagain Doktor Avdelningen för livsmedels- och näringsvetenskaper
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Kvalifikationer

PhD Food Sciences

Information om forskning och undervisning

Natural Fortification of Vitamin B12 in Plant-based Foods by Microbial in situ Synthesis

Potential of microbes to synthesize in situ vitamins can be exploited to naturally fortify foods and to synthesize vitamins to new matrices. In our research group, we study vitamin B12 synthesis focusing on bacteria which are allowed to be used in food production. The focus is on *Propionibacterium freudenreichii*, especially its vitamin B12 synthesis mechanisms and factors affecting efficiency of the synthesis. Integrating tools of molecular microbiology with those of food chemistry and technology will give excellent ground for scientific breakthroughs. On the other hand, understanding the molecular mechanisms governing in situ vitamin B12 production will enable new innovations in production of science-based functional foods and ingredients.

Publikationer

Vitamin B12 production in solubilized protein extract of bioprocessed wheat bran with *Propionibacterium freudenreichii*

Chamlagain, B., Edelmann, M., Katina, K., Varmanen, P. & Piironen, V., 4 jan. 2024, I: LWT-Food Science and Technology. 192, 115731.

Food by-product valorisation in nutrients through spent brewer's yeast bioprocessing with *Propionibacterium freudenreichii*

Kruk, M., Varmanen, P., Edelmann, M., Chamlagain, B. & Trzaskowska, M., 14 dec. 2023, I: Journal of Cleaner Production.

In situ production of vitamin B12 and dextran in soya flour and rice bran: A tool to improve flavour and texture of B12-fortified bread

Wang, Y., Xie, C., Pulkkinen, M., Edelmann, M., Chamlagain, B., Coda, R., Sandell, M., Piironen, V., Maina, N. & Katina, K., 1 maj 2022, I: LWT-Food Science and Technology. 161, 113407, 12 s., 113407.

Fermentation of cereal, pseudo-cereal and legume materials with *Propionibacterium freudenreichii* and *Levilactobacillus brevis* for vitamin B12 fortification

Xie, C., Coda, R., Chamlagain, B., Edelmann, M., Varmanen, P., Piironen, V. & Katina, K., feb. 2021, I: LWT-Food Science and Technology. 137, 9 s., 110431.

Bioaccessibility of vitamin B12 synthesized by *Propionibacterium freudenreichii* and from products made with fermented wheat bran extract

Chamlagain, B., Peltonen, L., Edelmann, M., Ramos-Diaz, J. M., Kemppinen, A., Jouppila, K., Varmanen, P. & Piironen, V., 2021, I: Current research in food science. 4, s. 499-502 4 s.

Niacin contents of cereal-milling products in food-composition databases need to be updated

Chamlagain, B., Rautio, S., Edelmann, M., Ollilainen, V. & Piironen, V., aug. 2020, I: Journal of Food Composition and Analysis. 91, 7 s., 103518.

Riboflavin, niacin, folate and vitamin B12 in commercial microalgae powders

Edelmann, M., Aalto, S., Chamlagain, B., Kariluoto, S. & Piironen, V., sep. 2019, I: Journal of Food Composition and Analysis. 82, 10 s., 103226.

Co-fermentation of *Propionibacterium freudenreichii* and *Lactobacillus brevis* in Wheat Bran for in situ Production of Vitamin B12

Xie, C., Coda, R., Chamlagain, B., Varmanen, P., Piironen, V. & Katina, K., 5 juli 2019, I: *Frontiers in Microbiology*. 10, July, 10 s., 1541.

In situ fortification of vitamin B12 in wheat flour and wheat bran by fermentation with *Propionibacterium freudenreichii*

Xie, C., Coda, R., Chamlagain, B., Edelmann, M., Deptula, P., Varmanen, P., Piironen, V. & Katina, K., 4 maj 2018, I: *Journal of Cereal Science*. 81, s. 133-139 7 s.

In situ production of active vitamin B12 in cereal matrices using *Propionibacterium freudenreichii*

Chamlagain, B., Sugito, T. A., Deptula, P., Edelmann, M., Kariluoto, S., Varmanen, P. & Piironen, V., jan. 2018, I: *Food Science & Nutrition*. 6, 1, s. 67-76 10 s.

Bioprosessoinnilla B12-vitamiinia vilja- ja palkokasvipohjaisiin elintarvikkeisiin

Chamlagain, B. & Edelmann, M., 14 dec. 2017, I: *Kehittyvä Elintarvike*. 28, 6, s. 50-51 2 s.

Microbial Metabolic Networks at the Mucus Layer Lead to Diet-Independent Butyrate and Vitamin B12 Production by Intestinal Symbionts

Belzer, C., Chia, L. W., Aalvink, S., Chamlagain, B., Piironen, V., Knol, J. & de Vos, W. M., 19 sep. 2017, I: *mBio*. 8, 5, 14 s., ARTN e00770-17.

Biofortification of riboflavin and folate in idli batter, based on fermented cereal and pulse, by *Lactococcus lactis* N8 and *Saccharomyces boulardii* SAA655

Rajendran, S. C. C., Chamlagain, B., Kariluoto, S., Piironen, V. & Saris, P. E., 3 maj 2017, I: *Journal of Applied Microbiology*. 122, 6, s. 1663-1671 9 s.

Food-Like Growth Conditions Support Production of Active Vitamin B12 by *Propionibacterium freudenreichii* 2067 without DMBI, the Lower Ligand Base, or Cobalt Supplementation

Deptula, P., Chamlagain, B., Edelmann, M., Sangsuwan, P., Nyman, T. A., Savijoki, K., Piironen, V. & Varmanen, P., 8 mars 2017, I: *Frontiers in Microbiology*. 8, 11 s., 368.

Comparative genomics and physiology of the butyrate-producing bacterium *Intestinimonas butyriciproducens*

Nam Bui, T. P., Shetty, S., Lagkouravdos, I., Ritari, J., Chamlagain, B., Douillard, F., Paulin, L. G., Piironen, V., Clavel, T., Plugge, C. M. & de Vos, W. M., 7 okt. 2016, I: *Environmental microbiology reports*. 8, 6, s. 1024-1037 14 s.

Stability of added and in situ-produced vitamin B12 in breadmaking

Edelmann, M., Chamlagain, B. S., Santin, M., Kariluoto, S. & Piironen, V., 10 feb. 2016, I: *Food Chemistry*. 204, s. 21-28 8 s.

Effect of the lower ligand precursors on vitamin B12 production by food-grade *Propionibacteria*

Chamlagain, B., Deptula, P., Edelmann, M., Kariluoto, S., Grattepanche, F., Lacroix, C., Varmanen, P. & Piironen, V., 2016, I: *LWT-Food Science and Technology*. 72, s. 117-124 8 s.

Letter to the editor on 'Enhancing vitamin B₁₂ content in soy-yogurt by *Lactobacillus reuteri*, *IJFM*. 206:56–59'

Varmanen, P. K., Deptula, P., Chamlagain, B. S. & Piironen, V. I., 2016, I: *International Journal of Food Microbiology*. 228, s. 33 1 s.

BluB/CobT2 fusion enzyme activity reveals mechanisms responsible for production of active form of vitamin B 12 by *Propionibacterium freudenreichii*

Deptula, P., Kylli, P. T., Chamlagain, B. S., Holm, L. U. T., Kostianen, R. K., Piironen, V. I., Savijoki, K. K. & Varmanen, P. K., 23 nov. 2015, I: *Microbial Cell Factories*. 14, 12 s., 186.

Ultra-high performance liquid chromatographic and mass spectrometric analysis of active vitamin B12 in cells of *Propionibacterium* and fermented cereal matrices

Chamlagain, B., Edelmann, M., Kariluoto, S., Ollilainen, V. & Piironen, V., 2015, I: *Food Chemistry*. 166, s. 630-638 9 s.

Trends of antibiotic resistance in mesophilic and psychrotrophic bacterial populations during cold storage of raw milk
Munsch-Alatossava, P., Gauchi, J-P., Chamlagain, B. & Alatossava, T., 2012, I: ISRN Microbiology. 2012, Art. No. 918208 , 13 s.

Aktiviteter

Co-examiner of Palni Kundra's Doctoral dissertation at ETH Zurich
Bhawani Chamlagain (Opponent)
21 juni 2023

Frontiers in nutrition (Tidskrift)
Bhawani Chamlagain (Medlem i redaktionell ledning)
2021 → 2022

Projekt

Leg4Life: Legumes for sustainable food system and healthy life

Pajari, A., Piironen, V., Vanhatalo, A., Simojoki, A., Jouppila, K., Kariluoto, S., Päivärinta, E., Konttinen, H., Hyytiäinen, K., Lombardini (former Lombardini-Riipinen), C., Lamminen, M., Alakukku, L., Chamlagain, B., Coda, R., Ertbjerg, P., Edelmann, M., Halmemies-Beauchet-Filleau, A., Itkonen, S., Katina, K., Knaapila, A., Kokkonen, T., Kuoppala, K., Lampi, A., Mäkelä, P., Nurmi, V., Ramos-Diaz, J. M., Salonen, A., Sandell, M., Sihvonen, M., Sontag-Strohm, T., Stoddard, F., Tenkanen, M. & Varmanen, P.
01/06/2019 → 31/08/2025

Leg4Life: Palkokasveilla kohti kestäväää ruokajärjestelmää ja terveyttä

Jouppila, K., Pajari, A., Simojoki, A., Vanhatalo, A., Ahrends, H. E., Bäck, S., Chamlagain, B., Honkanen, A., Immonen, H. M. A., Itkonen, S., Karanko, I. M. W., Kemppinen, L. K., Koivula, A. P. A., Kostiaainen, H. E., Kumpulainen, R. M. K., Lamminen, M., Lundberg, M. A., Mäkelä, A. M., Nieminen, F. H., Oja-Lipasti, R. E., Pietilä, T. K. M., Päivärinta, E., Rummukainen, N. J., Silfverhuth, J. S. M. & Toivonen, V. E.
Finlands Akademi, Suomen Akatemia Projektilaskutus
01/09/2022 → 31/08/2025

B12WEGAIN: Natural vitamin B12 fortification of future foods by bioprocessing and controlled cell-lysis of Propionibacterium freudenreichii

Varmanen, P., Piironen, V., Sillanpää, L. A., Loivamaa, I., Savijoki, K., Chamlagain, B. & Edelmann, M.
01/01/2021 → 31/12/2023

Molecular basis for natural vitamin B12 fortification of emerging new foods by utilization of Propionibacterium freudenreichii

Piironen, V., Loivamaa, I., Edelmann, M., Chamlagain, B., Savijoki, K., Varmanen, P., Sillanpää, L. A. & Zhang, R.
01/09/2019 → 31/08/2023

B-GELS: Water-in-oleogel emulsions as vitamin B12 delivery and protective systems for plant-based products (Faculty of Agriculture and Forestry Proof of Concept Grant, University of Helsinki)

Valoppi, F. & Chamlagain, B.
01/09/2020 → 31/12/2020

BIOB12: Vitamin B12-bioenriched wheat bran ingredients for food applications (BIOB12)

Piironen, V., Chamlagain, B., Edelmann, M., Varmanen, P. & Katina, K.
01/07/2018 → 30/06/2019

BIOFORCE: Bio-enriched bran ingredients - in situ synthesis of vitamin B12 and folate with propionibacteria and lactic acid bacteria

Piironen, V., Varmanen, P., Chamlagain, B., Edelmann, M. & Katina, K.
01/03/2017 → 31/03/2018

Natural Fortification of Foods: Microbial in situ Synthesis of Vitamin B12 and Folate in Cereal Matrix

Piironen, V., Varmanen, P., Chamlagain, B., Deptula, P., Edelmann, M., Kariluoto, S., Ollilainen, V., Nyman, T., Korhola, M., Lampi, A. & Salovaara, H.

01/09/2012 → 31/08/2016

FOLAFIBRE-Aqueous processing of oats and barley...

Piironen, V., Lampi, A., Kariluoto, S., Edelmann, M., Nyström, L., Pokela, L., Chamlagain, B. & Koivumäki, T.

01/01/2007 → 31/12/2010

Aktiviteter**Food Microbiology (Tidskrift)**

Bhawani Chamlagain (Referentgranskare)

2024

Journal of Applied Phycology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)

2024

LWT-Food Science and Technology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)

2024

Frontiers in Microbiology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)

2023

Frontiers in nutrition (Tidskrift)

Bhawani Chamlagain (Referentgranskare)

2023

LWT-Food Science and Technology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)

2023

Sustainable food technology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)

2023

Antonie van Leeuwenhoek (Tidskrift)

Bhawani Chamlagain (Referentgranskare)

2022

Applied Microbiology and Biotechnology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)

2022

Food Chemistry (Tidskrift)

Bhawani Chamlagain (Referentgranskare)

2022

Frontiers in nutrition (Tidskrift)

Bhawani Chamlagain (Referentgranskare)

2022

Microbial Cell Factories (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2022

Microbial Cell Factories (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2022

ACS food science & technology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2021

Food Chemistry (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2021

Frontiers in Microbiology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2021

Frontiers in nutrition (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2021

Frontiers in nutrition (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2021

Journal of Food Composition and Analysis (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2021

Journal of Food Composition and Analysis (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2021

LWT-Food Science and Technology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2021

LWT-Food Science and Technology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2021

Microorganisms (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2021

Biocatalysis and agricultural biotechnology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2020

Food Chemistry (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2020

Foods (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2020

Food analytical methods (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2019

Food Chemistry (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2019

Journal of food science and technology Nepal (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2019

LWT-Food Science and Technology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2019

Preparative Biochemistry and Biotechnology (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2019

Food Chemistry (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2018

International Journal for Vitamin and Nutrition Research (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2018

Journal of food science and technology Nepal (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2018

Antonie van Leeuwenhoek (Tidskrift)

Bhawani Chamlagain (Referentgranskare)
2017

Aktiviteter**Evaluation of Master thesis**

Bhawani Chamlagain (Deltagare)
2023

Evaluation of Master thesis

Bhawani Chamlagain (Deltagare)
2022

Evaluation of Master thesis

Bhawani Chamlagain (Deltagare)
2020

Evaluation of Master thesis

Bhawani Chamlagain (Deltagare)
2020

Aktiviteter**Institute of Food, Nutrition and Health (IFNH) seminars, ETH Zurich**

Bhawani Chamlagain (!!Speaker)
29 okt. 2019

Aktiviteter**7th International Vitamin Conference 2023, 20-22 September Copenhagen**

Bhawani Chamlagain (Talare: Presentation)
20 sep. 2023 → 22 sep. 2023

6th International Vitamin Conference 2021 22-24 September Copenhagen

Bhawani Chamlagain (Talare: Presentation)
22 sep. 2021 → 24 sep. 2021

Institute of Food, Nutrition and Health (IFNH) seminars, ETH Zurich

Bhawani Chamlagain (!!Speaker)
29 okt. 2019

4th International Vitamin Conference (25-27 May 2016), Copenhagen, Denmark

Bhawani Chamlagain (Talare: Presentation)
25 maj 2016 → 27 maj 2016

EURO FOOD CHEM XVIII

Bhawani Chamlagain (Poster presentation)
13 okt. 2015 → 16 okt. 2015

The 32nd Nordic Cereal Congress: Future Food Security – New Opportunities for Nordic Crops

Bhawani Chamlagain (Talare: Presentation)
7 sep. 2015 → 9 sep. 2015

3rd International Vitamin Conference (12-15 May 2014, Washington, DC, USA)

Bhawani Chamlagain (Poster presentation)
12 maj 2014 → 15 maj 2014

V Symposium on Sourdough: Cereal Fermentation for Future Foods 2012, 10-12 October 2012, Helsinki, Finland

Bhawani Chamlagain (Poster presentation)
10 okt. 2012 → 12 okt. 2012

2nd International Vitamin Conference, 23-25 May 2012, Copenhagen, Denmark

Bhawani Chamlagain (Poster presentation)
23 maj 2012 → 25 maj 2012

Priser

"Best Doctoral Thesis Award" by Doctoral Programme in Food Chain and Health
Chamlagain, Bhawani (!!Recipient), 15 nov. 2017

"Best Doctoral Dissertation Award" by The Finnish Society of Food Science and Technology (ETS)
Chamlagain, Bhawani (!!Recipient), 21 mars 2017

Aktiviteter

Supervision of Master thesis (Leila Toivokoski)
Bhawani Chamlagain (Handledare)
nov. 2023 → ...

Supervision of Master thesis (Aino Rinta-Koski)
Bhawani Chamlagain (Handledare)
apr. 2023 → ...

Supervision of Master thesis (Ira Karanko)
Bhawani Chamlagain (Handledare)
mars 2023 → ...

LC-MS/MS menetelmän kehittäminen ja validointi B12-vitamiinin määrittämiseksi fermentoiduista elintarvikkeista
Mari Lehtonen (Handledare) & Bhawani Chamlagain (Handledare)
mars 2022 → ...

Supervision of Master thesis (Helle Grönfors)
Bhawani Chamlagain (Handledare)
mars 2022 → 2023

Supervision of Research trainee (Romane Gandon)
Bhawani Chamlagain (Handledare)
mars 2022 → juli 2022

Supervision of Master thesis (Jouni Hiltunen)
Bhawani Chamlagain (Handledare)
feb. 2022 → apr. 2022

Supervision of Research Trainee (Oscar Namessi)
Bhawani Chamlagain (Handledare)
8 mars 2021 → 23 juli 2021

Supervision of Master thesis (Siri Seppänen)
Bhawani Chamlagain (Handledare)
mars 2021 → sep. 2021

Supervision of Master thesis (Valentina Succi)
Bhawani Chamlagain (Handledare)
24 feb. 2020 → 24 aug. 2020

Supervision of Research training (Noreen Orth)
Bhawani Chamlagain (Handledare)
mars 2019 → juli 2019

Supervision of Master thesis (Liisa Peltonen)

Bhawani Chamlagain (Handledare)

nov. 2018 → ...

Supervision of Research Internship (Benedikt Stiglbauer)

Bhawani Chamlagain (Handledare)

26 feb. 2018 → 11 maj 2018

Supervision of Master thesis (Marco Santin)

Bhawani Chamlagain (Bihandledare)

17 feb. 2014 → 17 juli 2014

Supervision of Master thesis (Kaisa Hiippala)

Bhawani Chamlagain (Handledare)

1 nov. 2013 → 30 juni 2014

Supervision of Master thesis (Emmi Hovilehto)

Bhawani Chamlagain (Handledare)

1 apr. 2013 → 30 nov. 2013

Supervision of Master thesis (Saija Rautio)

Bhawani Chamlagain (Handledare)

1 apr. 2013 → 31 dec. 2013

Supervision of Master thesis (Tessa A. Sugito)

Bhawani Chamlagain (Handledare)

1 jan. 2012 → 31 dec. 2013