Susheel Bhanu Busi

Curriculum Vitae

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EDUCATION

University of Missouri, Columbia, Missouri, USA
Ph.D. in Molecular Pathogenesis and Therapeutics **2018**
Dissertation title: "Elucidating the role of biofilms and the complex gut microbiome in the etiology of cancer in a rat model of human familial adenomatous polyposis"

Hood College, Frederick, Maryland, USA
M.S. in Biomedical Science **2012**
Thesis title**:** "Studies on the selection of a strain of *Pediococcus acidilactici* to grow at optimal conditions for the production of probiotics"

Madras Christian College, Chennai, Tamil Nadu, India
B.S. in Microbiology **2008**
Areas of Concentration: Microbiology, Introduction to Biochemistry, Virology, Food and Agricultural Microbiology, and Applied Microbiology

PROFESSIONAL AND RESEARCH EXPERIENCE

Head of Molecular Ecology **February 2025 – Present**
Molecular Ecology group
Soils and Land Use Science Area
UK Centre for Ecology and Hydrology, Wallingford, United Kingdom

Research: Delivering molecular observatories for environmental resilience and One Health

- Provide strategic leadership for molecular ecology across UKCEH, aligning research with national monitoring needs and emerging UKRI priorities
- Oversee development of high-resolution approaches for longitudinal microbiome dynamics across terrestrial and aquatic systems
- Integrate metagenome-assembled genomes, gene catalogues and trait frameworks to develop indicators of soil and ecosystem health
- Build partnerships with academia, government and industry to translate microbial data into operational evidence
- Line manage researchers and support career development, training and fellowship pipelines
- Lead funding development from concept through to award and delivery

Molecular Ecologist **July 2023 – February 2025**
Molecular Ecology group

Soils and Land Use Science Area
UK Centre for Ecology and Hydrology, Wallingford, United Kingdom

Research: Decoding Biodiversity – Linking fune-scale microbial diversity to Ecosystem Functions

- Developing tools for the high-resolution longitudinal microbiome dynamics
- Integrating genome-resolved metagenomics with gene catalogues to identify and develop nutrient cycling soil health indicators
- Linking microbial genomic diversity to community function

Research and Development Specialist **January 2019 – June 2023**

Supervisor: Dr. Paul Wilmes
Systems Ecology group
Luxembourg Center for Systems Biology
University of Luxembourg, Esch-sur-Alzette, Luxembourg

Research: Unravelling the evolution and spread of antimicrobial resistance (AMR) in a One Health setting

- Elucidating the presence and prevalence of AMR during the first year of human neonatal development
- Understanding the genome-scale evolution of AMR in an antibiotic-treated mouse model
- Characterizing the functions including AMR underlying cross-domain interactions in environmental (wastewater, agricultural and glacier-fed stream) ecosystems
- Tracking the dissemination of AMR via mobile genetic elements across engineered and natural systems

Research: Multi-omics approaches to understanding the nature, biochemical functions, and genetic makeup of biofilms in alpine glacier-fed streams

- Systematic characterisation of biofilms in high alpine glacier-fed streams
- Genomic and metabolic reconstruction of prevalent and novel, unreported genomes underpinning biofilm mode of life
- Integration of meta-omic methodologies including third-generation sequencing technologies for synergistic functional inferences

Graduate Research Associate **December 2013 – December 2018**

Advisors: Dr. James Amos-Landgraf and Dr. Craig Franklin
Molecular Pathogenesis and Therapeutics (MPT) Program
Department of Molecular Microbiology & Immunology
University of Missouri, Columbia, MO

PhD Research: Multi-omics approaches to understanding the role of biofilms and the complex gut microbiome in a rat model of human colon cancer

- Investigated the effect of the microbiome in colon cancer models using integrated RNAseq, 16S rDNA sequencing and metabolomics methodologies
- Utilized LC-MS/MS to narrow down identity of putative metabolites that affect the phenotype
- Analyzed the effects of gut bacteria on the adenoma development in rodent models
- Tested the prevalence and/or absence of bacteria taxa affecting tumorigenesis by treating Pirc rats with specific bacterial taxa
- Investigated markerless deletion methods in *Desulfovibrio sp.* to determine the role of biofilms in colon cancer progression

Graduate Research Associate **October 2013 – November 2013**

Advisor: Dr. Huatao Guo

Molecular Pathogenesis and Therapeutics (MPT) Program

Department of Molecular Microbiology & Immunology

University of Missouri, Columbia, MO

- Cloned the *Bordetella spp* reverse-transcriptase gene to determine the mechanisms underlying bacterial replication
- Designed and established a synthetic self-cleaving RNA-intermediate to be copied into a double-stranded DNA for replication, using an antibiotic-selection system

Graduate Research Associate **September 2013 – October 2013**

Advisor: Dr. Jerod Skyberg

Molecular Pathogenesis and Therapeutics (MPT) Program

Department of Molecular Microbiology & Immunology

University of Missouri, Columbia, MO

- Determined the effect of *Brucella abortus* on innate immune response in a murine host
- Examined and tested the IL-18 pathway using immune blockers to study infection mechanisms and for disease treatment

Research Scientist **January 2012 – August 2013**

Imagilin Technology LLC.

Frederick, Maryland

- *Research – Probiotic supplements*
  - *Team Lead:* Developed non-GMO novel nutraceutical products using *Pediococcus*-based probiotics
  - Formulated probiotic supplements for small animals and humans
  - Selected for a strain of *Pediococcus acidilactici* to grow at optimal conditions large-scale probiotic production

- Developed methods for detection and confirmation high-temperature, low-pH resistant strain of *P.acidilactici*
- Aseptic culturing techniques, media preparation & optimization methods, serial dilution, spectrophotometric determination of optical density, and standard microbiological procedures used on a regular basis

Operations Manager **July 2009 – December 2011**

Imagilin Technology LLC.

Frederick, Maryland

- *Manufacture and Production*
  - Oversaw production of probiotic supplements manufactured by the company
  - Implemented and supervised requirements to obtain certified General Manufacturing Practices (cGMP) rating
  - Developed SOPs and established inventory tracking system
  - Work included ordering and checking inventory, scheduling, organizing manufacturing and vialling bottles of *P. acidilactici*-based probiotics and stocking
  - Generated monthly sales reports and set-up maintenance of production library

Associate Research Scientist **February 2009 – December 2011**

Imagilin Technology LLC.

Frederick, Maryland

- *Research – Probiotic supplements*
  - Identified and selected high-temperature, low-pH resistant strain of *P. acidilactici*
  - Setup protocols for large-scale fermentation and process of the bacteria in collaboration with University of Maryland
  - Presented project and research proposals at weekly meeting to Senior Scientist and CEO

AdWords Representative **May 2008 – January 2009**

Google Inc.

Hyderabad, India

- Assigned appropriate Family status to online advertisements
- Reviewed text, image and video ads
- Presented weekly to team lead; challenges to appraising ads and methods to improving reviewer's efficiency

RESEARCH SUPPORT (including grants contributed to)

1. *Natural Environment Research Council, UK*. CLEAR-NEAGH: Catchment-Level Environmental AMR & eDNA Reconnaissance for Lough Neagh. (2026-2027; £920,000). P.I. – Susheel Bhanu Busi, Ph.D.
2. *Natural Environment Research Council, UK*. MICRO-CYCLE: Unravelling the role of microbial genomic traits in organic matter cycling and molecular composition along the river continuum. (2025-2027; £871,932). P.I. – Daniel Read, Ph.D., Co-I – Susheel Bhanu Busi, Ph.D.
3. *Natural Environment Research Council, UK*. P-FASE: Advancing and integrating knowledge and data on PFAS sources, fate and risks for UK environments. (2025-2029; £1,215,614). P.I. – Elma Lahive, Ph.D., Co-I – Susheel Bhanu Busi, Ph.D.
4. *Community Science Program Proposal*. Joint Genome Institute. Vanishing Glaciers Project – Understanding the role of viruses and cross-domain interactions in glacier-fed streams. (2023). P.I. Tom Battin, Ph.D. (Not funded)
5. *Medical Research Council (United Kingdom Research and Innovation) in collaboration with Luxembourg National Research Foundation.* PathoBiome - Expansion and Validation of Microbiome-derived Virulence Factors. P.I. – Paul Wilmes, Ph.D. and Robert D. Finn, Ph.D. (Not funded)
6. *Luxembourg National Research Foundation*. Nimools alleng, ëmmer mateneen: Living in a microbial world. (2022). P.I. – Charlotte de Rudder, Ph.D. and **Susheel Bhanu Busi**, Ph.D. (€2940)
7. *Advanced Grant.* European Research Council (ERC). (2020-2024) JANUS - Understanding the impacts of climate change on the microbial life in high-mountain streams. P.I. Tom Battin, Ph.D. (Not funded)
8. *Switzerland National Science Foundation (SNSF)*. (2020-2022) PERSIST - Unravelling the impacts of climate change on the microbial life in high-mountain streams. P.I. Tom Battin, Ph.D. (€1,400,000)
9. *Start-up Funding*. Department of Veterinary Pathobiology, University of Missouri-Columbia. (2012 – 2018). P.I. - J. Amos-Landgraf, Ph.D. ($500,000)
10. *Phi Zeta grant*, College of Veterinary Medicine, University of Missouri-Columbia. Identifying fecal biomarkers of disease progression using congenic strains of a rat model of human colon cancer. (2015) P.I. - **Susheel Bhanu Busi**. ($1000)
11. *University of Missouri Research Board grant*, Microbiota conferred resistance to colon cancer. (2017) P.I. - J. Amos-Landgraf, Ph.D. and **Susheel Bhanu Busi** ($50,000)
12. *Veterinary Medicine Faculty Research grant*, University of Missouri-Columbia. *Desulfovibrio vulgaris* Hildenborough modulates tumor burden and complex gut microbiota structure in a rat model of familial adenomatous polyposis. (2017) P.I. - J. Amos-Landgraf, Ph.D. ($50,000)
13. *Molecular Cytology Core (MCC) grant*, University of Missouri-Columbia. Evaluation of biofilms' effect on colonic tumor burden in a rat model of familial adenomatous polyposis. (2017-2018). P.I. – **Susheel Bhanu Busi.** ($13,000)

MANUSCRIPTS AND PUBLICATIONS (*equal contributions, corresponding author)

In Review or Preprints

1. Tim I Goodall, **Susheel Bhanu Busi**, Daniel Read, Amy C Thorpe, Briony A Jones, Bridget Emmett, Robert I Griffiths (2026). Environmental filtering shapes divergent bacterial strategies and genomic traits across soil niches. bioRxiv. doi: 10.64898/2026.01.16.699881.

2. Amy C Thorpe, Susheel Bhanu Busi, Jonathan Warren, Lindsay K. Newbold, Joe D. Taylor, Kerry Walsh, Daniel S Read (2025). National-scale biogeography and function of river and stream bacterial biofilm communities. bioRxiv. doi: 10.1101/2025.11.03.686311.

Published or In-Press

1. Kunal Dixit, **Susheel Bhanu Busi**, Anam Ahmed, Avinash Kshirsagar, Christian Jäger, Alka Singh, Varun Shah, Sunil Saroj, Vineet Ahuja, Paul Wilmes, Yogesh Shouche, Dhiraj Dhotre, and Govind Makharia (2024). Multi-meta-omics reveal distinct microbial genomic profiles and metabolic dysregulation in non-celiac gluten sensitivity. *mSystems (mSystems01146-24; in-press)*.

2. Meri AJ Anderson, Amy C Thorpe, **Susheel Bhanu Busi**, Hyun Soon Gweon, Jonathan Warren, Kerry Walsh, Daniel S Read (2026). Unlocking river biofilm microbial diversity: a comparative analysis of sequencing technologies. *Molecular Ecology Resources*; Vol. 26(1) e70075. doi: 10.1111/1755-0998.70075Digital Object Identifier (DOI).

3. Kevin L Gustafson, **Susheel Bhanu Busi**, Zachary L McAdams, Rachael E McCorkle, Pavlo Khodakivskyi, Nathan J Bivens, Daniel J Davis, Murugesan Raju, Lyndon M Coghill, Elena A Goun, James Amos-Landgraf, Craig L Franklin, Paul Wilmes, Rene Cortese, Aaron C Ericsson (2025). Fetal programming by the parental microbiome of offspring behavior, and DNA methylation and gene expression within the hippocampus. *Microbiome* **13**, 254. 10.3389. doi: 10.1186/s40168-025-02226-3.

4. Amy C Thorpe, **Susheel Bhanu Busi**, Jonathan Warren, Laura H Hunt, Kerry Walsh, Daniel S Read (2025). National-scale biogeography and function of river and stream bacterial biofilm communities. *Nat Commun* **16**, 10571. doi: 10.1038/s41467-025-65620-3.

5. **Susheel Bhanu Busi** (2025). Monitoring, modeling, and mitigation in terrestrial ecosystems: microbial response to climate change. *Front. Microbiol.* 16:1717735. doi: 10.3389/fmicb.2025.1717735.

6. Rémy Villette, Júlia Ortís Sunyer, Polina V Novikova, Velma TE Aho, Viacheslav A Petrov, Oskar Hickl, **Susheel Bhanu Busi**, Charlotte De Rudder, Benoit J Kunath, Anna Heintz-Buschart, Jean-Pierre Trezzi, Rashi Halder, Christian Jäger, Laura A Lebrun, Annegrät Daujeumont, Sebastian Schade, Annette Janzen, Nico Jehmlich, Martin von Bergen, Cédric C Laczny, Patrick May, Claudia Trenkwalder, Wolfgang Oertel, Brit Mollenhauer, Paul Wilmes (2025). Integrated multi-omics highlights alterations of gut microbiome functions in prodromal and idiopathic Parkinson's disease. *Microbiome* **13**, 200. doi: 10.1186/s40168-025-02227-2

7. Tim Goodall, Robert I Griffiths, Hyun S Gweon, Lisa Norton, **Susheel Bhanu Busi**, Daniel S Read (2025). Deciphering Landscape-Scale Plant Cover and Biodiversity From Soil eDNA. *Environmental DNA* 7, no. 5: e70191. doi: 10.1002/edn3.70191.

8. Tim Goodall, **Susheel Bhanu Busi**, Robert I Griffiths, Briony Jones, Richard F Pywell, Andrew Richards, Marek Nowakowski, Daniel S Read (2025). Soil properties in agricultural systems affect microbial genomic traits. *FEMS Microbes*, Volume 6, 2025, xtaf008, doi: 10.1093/femsmc/xtaf008.

9. Hristina Kochoska, Jan Kollár, Kateřina Kopalová, Michael Styllas, Leïla Ezzat, Grégoire Michoud, Hannes Peter, Massimo Bourquin, **Susheel Bhanu Busi**, Paul B Hamilton, Tom J Battin, Tyler J Kohler (2025). Glacier-fed stream diatoms (Bacillariophyta) from the Rwenzori Mountains, Uganda, with the description of one new species from the genus Neidium. *Diatom Research*, *40*(3), 237–258. doi: 10.1080/0269249X.2025.2474765.

10. Mina Tsenkova, Madita Brauer, Vitaly Igorevich Pozdeev, Marat Kasakin, **Susheel Bhanu Busi**, Maryse Schmoetten, Dean Cheung, Marianne Meyers, Fabien Rodriguez, Anthoula Gaigneaux, Eric Koncina, Cedric Gilson, Lisa Schlicker, Diran Herebian, Martine Schmitz, Laura de Nies, Ertan Mayatepek, Serge Haan, Carine de Beaufort, Thorsten Cramer, Johannes Meiser, Carole L Linster, Paul Wilmes, Elisabeth Letellier (2025). Ketogenic diet suppresses colorectal cancer through the gut microbiome long chain fatty acid stearate. *Nat Commun* **16**, 1792. doi: 10.1038/s41467-025-56678-0.

11. Aileen Ute Geers, Grégoire Michoud, **Susheel Bhanu Busi**, Hannes Peter, Tyler J Kohler, Leïla Ezzat, Vanishing Glaciers Field Team, Tom J Battin (2025). Deciphering the biosynthetic landscape of biofilms in glacier-fed streams. *mSystems* 10:e01137-24. doi: 10.1128/msystems.01137-24.

12. Massimo Bourquin, Hannes Peter, Grégoire Michoud, **Susheel Bhanu Busi**, Tyler J Kohler, Andrew L Robison, Mike Styllas, Leïla Ezzat, Aileen U Geers, Matthias Huss, Stilianos Fodelianakis, Vanishing Glaciers Field Team Styllas Michael, Schön Martina, Tolosano Matteo, de Staercke Vincent, Kohler Tyler J., Tom J Battin (2025). Predicting climate-change impacts on the global glacier-fed stream microbiome. *Nat Commun* **16**, 1264. doi: 10.1038/s41467-025-56426-4.

13. Leïla Ezzat, Hannes Peter, Massimo Bourquin, **Susheel Bhanu Busi**, Grégoire Michoud, Stilianos Fodelianakis, Tyler J Kohler, Thomas Lamy, Aileen Geers, Paraskevi Pramateftaki, Florian Baier, Ramona Marasco, Daniele Daffonchio, Nicola Deluigi, Paul Wilmes, Michail Styllas, Martina Schön, Matteo Tolosano, Vincent De Staercke, Tom J Battin (2025). *Nature* **637**, 622–630. doi: 10.1038/s41586-024-08313-z.

14. Massimo Bourquin, Hannes Peter, Grégoire Michoud, Aileen Geers, The Vanishing Glaciers Field Team, **Susheel Bhanu Busi**, Tom Ian Battin. (2025). Glacier influence shapes the genomic architecture of the downstream aquatic microbiome. *ISME Communications*, Volume 5, Issue 1, ycaf076. doi: 10.1093/ismeco/ycaf076.

15. Grégoire Michoud, Hannes Peter, **Susheel Bhanu Busi**, Massimo Bourquin, Tyler J Kohler, Aileen Geers, Leila Ezzat, Vanishing Glaciers Field Team Styllas Michael, Schön Martina,

Tolosano Matteo, de Staercke Vincent, Kohler Tyler, Tom J Battin (2025). Mapping the metagenomic diversity of the multi-kingdom glacier-fed stream microbiome. *Nat Microbiol* **10**, 217–230. doi: 10.1038/s41564-024-01874-9.

16. Rola Shaaban, **Susheel Bhanu Busi**, Paul Wilmes, Jean-Louis Guéant, Almut Heinken (2024). Personalized modeling of gut microbiome metabolism throughout the first year of life. *Commun Med* **4**, 281. doi: 10.1038/s43856-024-00715-4.

17. Begoña Talavera Andújar, Sandro L Pereira, **Susheel Bhanu Busi**, Tatiana Usnich, Max Borsche, Sibel Ertan, Peter Bauer, Arndt Rolfs, Soraya Hezzaz, Jenny Ghelfi, Norbert Brüggemann, Paul Antony, Paul Wilmes, Christine Klein, Anne Grünewald, Emma L Schymanski (2024). Exploring environmental modifiers of LRRK2-associated Parkinson's disease penetrance: An exposomics and metagenomics pilot study on household dust. *Environment International*, vol:104, 109151. doi: 10.1016/j.envint.2024.109151.

18. Rebecca Czolk, Laura de Nies, Thorsten Graf, **Susheel Bhanu Busi**, Rashi Halder, Jean Muller, F. Codreanu-Morel, Markus Ollert, Paul Wilmes, Carine De Beaufort, and Annette Kuehn (2024). Fecal IgE Analyses Reveal a Role for Stratifying Peanut-Allergic Patients. J *Investig Allergol Clin Immunol* 2025; Vol. 35(4). doi: 10.18176/jiaci.1008.

19. **Susheel Bhanu Busi***, Hannes Peter*, Jade Brandani, Massimo Bourquin, Leila Ezzat, Stilianos Fodelianakis, Tyler J. Kohler, Paraskevi Pramateftaki, Emmy Marie Oppliger, Paul Wilmes and Tom J. Battin (2023). Cross-domain interactions confer stability to benthic biofilms in proglacial streams. *Front. Microbiomes*, 2023.02. 10.3389. doi: 10.3389/frmbi.2023.1280809.

20. Hannes Peter, Gregoire Michoud, **Susheel Bhanu Busi**, and Tom J. Battin (2023). The role of phages for microdiverse bacterial communities in proglacial stream biofilms. *Front. Microbiomes*, 2023.02. 10.3389. doi: 10.3389/frmbi.2023.1279550.

21. Polina Novikova, **Susheel Bhanu Busi**, Alexander J. Probst, Patrick May and Paul Wilmes (2024). Functional assignment of gut-specific archaeal proteins in the human gut microbiome. *ISME Comm.*, vol. 4, Issue 1, January 2024, ycad014. doi: 10.1093/ismeco/ycad014.

22. Kristopher J. Schmit, Pierre Garcia, Alessia Sciortino, Velma T. E. Aho, Beatriz Pardo Rodriguez, Mélanie H. Thomas, Jean-Jacques Gérardy, Irati Bastero Acha, Rashi Halder, Camille Cialini, Tony Heurtaux, Irina Ostahi, **Susheel Bhanu Busi**, Léa Grandmougin, Tuesday Lowndes, Yogesh Singh, Eric C Martens, Michel Mittelbronn, Manuel Buttini, Paul Wilmes (2023). Fiber deprivation and microbiome-borne curli shift gut bacterial populations and accelerate disease in a mouse model of Parkinson's disease. *Cell reports*, 42 (9), 113071. doi:10.1016/j.celrep.2023.113071

23. Grégoire Michoud, Tyler J Kohler, Hannes Peter, Jade Brandani**, Susheel Bhanu Busi** and Tom J. Battin (2023). Unexpected functional diversity of stream biofilms within and across proglacial floodplains despite close spatial proximity. *Limnol Oceanogr.* doi: 10.1002/lno.12415.

24. Laura de Nies, Valentina Galata, Camille Martin-Gallausiaux, Milena Despotovic, **Susheel Bhanu Busi**, Chantal J Snoeck, Lea Delacour, Deepthi Poornima Budagavi, Cédric Christian Laczny, Janine Habier, Paula-Cristina Lupu, Rashi Halder, Joëlle V Fritz, Taina Marques, Estelle Sandt, Marc Paul O'Sullivan, Soumyabrata Ghosh, Venkata Satagopam, Rejko Krüger, Guy Fagherazzi, Markus Ollert, Feng Q Hefeng, Patrick May and Paul Wilmes (2023). Altered infective competence of the human gut microbiome in COVID-19. *Microbiome* 11 (1), 46. doi: 10.1186/s40168-023-01472-7.

25. Grégoire Michoud, Tyler J Kohler, Leïla Ezzat, Hannes Peter, Juliet Kigongo Nattabi, Rosemary Nalwanga, Paraskevi Pramateftaki, Michail Styllas, Matteo Tolosano, Vincent De Staercke, Martina Schön, Ramona Marasco, Daniele Daffonchio, Massimo Bourquin**,** **Susheel Bhanu Busi** and Tom J. Battin (2023). The dark side of the moon: first insights into the microbiome structure and function of one of the last glacier-fed streams in Africa. *Royal Society Open Science* 10 (8), 230329. doi: 10.1128/aem.02010-22.

26. Milena Despotovic, Laura de Nies, **Susheel Bhanu Busi** and Paul Wilmes (2023). Reservoirs of antimicrobial resistance in the context of One Health. *Current Opinion in Microbiology* 73, 102291. doi: 10.1016/j.mib.2023.102291.

27. Jade Brandani, Hannes Peter, Stilianos Fodelianakis, Tyler J. Kohler, Massimo Bourquin, Grégoire Michoud, **Susheel Bhanu Busi**, Stuart Lane, Leïla Ezzat and Tom J. Battin (2023). Homogeneous environmental selection structures the bacterial communities of benthic biofilms in proglacial floodplain streams. *Applied and Environmental* Microbiology 89 (3), e02010-22. doi: 10.1128/aem.02010-22.

28. Jade Brandani, Hannes Peter, **Susheel Bhanu Busi**, Tyler J. Kohler, Stilianos Fodelianakis, Leïla Ezzat, Grégoire Michoud, Massimo Bourquin, Paraskevi Pramateftaki, Matteo Roncoroni, Stuart Lane, Paul Wilmes and Tom J. Battin (2022). Spatial patterns of benthic biofilm diversity among streams draining proglacial floodplains. *Front. Microbiol.* 13, 948165. doi: 10.3389/fmicb.2022.948165.

29. **Susheel Bhanu Busi**, Zhentian Lei, Lloyd W. Sumner and James Amos-Landgraf (2023). Integrated metabolome and transcriptome analyses provide insight into colon cancer development by the gut microbiota. *mSystems* e00151-23. doi: 10.1128/msystems.00151-23.

30. **Susheel Bhanu Busi*****, Laura de Nies*, Paraskevi Pramateftaki, Massimo Bourquin, Tyler J. Kohler, Leïla Ezzat, Stilianos Fodelianakis, Grégoire Michoud, Hannes Peter, Michail Styllas, Matteo Tolosano, Vincent De Staercke, Martina Schön, Valentina Galata, Paul Wilmes and Tom J. Battin (2023). Glacier-fed stream biofilms harbour diverse resistomes and biosynthetic gene clusters. *Microb. Spectrum* e04069-22. doi: 10.1128/spectrum.04069-22.

31. **Susheel Bhanu Busi*****, Massimo Bourquin*, Stilianos Fodelianakis*, Grégoire Michoud, Tyler J. Kohler, Hannes Peter, Paraskevi Pramateftaki, Michail Styllas, Matteo Tolosano, Vincent De Staercke, Martina Schön, Valentina Galata, Laura de Nies, Ramona Marasco, Daniele Daffonchio, Jade Brandani, Leila Ezzat, Paul Wilmes and Tom J. Battin (2022). Genomic and metabolic adaptations of biofilms to ecological windows of opportunities in glacier-fed streams. *Nat. Commun.* 13, 2168. doi:10.1038/s41467-022-29914-0.

32. Laura de Nies*, **Susheel Bhanu Busi***, Mina Tsenkova, Rashi Halder, Elisabeth Letellier and Paul Wilmes (2022). Evolution of the murine gut resistome following broad-spectrum antibiotic treatment. *Nat. Commun.* 13, 2296. doi:10.1038/s41467-022-29919-9.

33. Massimo Bourquin*, **Susheel Bhanu Busi***, Stylianos Fodelianakis, Hannes Peter, Alex Washburne, Tyler Kohler, Leïla Ezzat, Paul Wilmes and Tom J. Battin (2022). The microbiome of cryospheric ecosystems. *Nat. Commun.* 13, 3087. doi:10.1038/s41467-022-30816-4.

34. Laura de Nies, **Susheel Bhanu Busi**, Benoit Josef Kunath, Patrick May and Paul Wilmes (2022). Mobilome-driven segregation of the resistome in biological wastewater treatment. *eLife* 11:e81196. doi: 10.7554/eLife.81196.

35. Leïla Ezzat, Stilianos Fodelianakis, Tyler J. Kohler, Massimo Bourquin, Jade Brandani, **Susheel Bhanu Busi**, Daniele Daffonchio, Vincent De Staercke, Ramona Marasco, Grégoire Michoud, Emmy Oppliger, Hannes Peter, Paraskevi Pramateftaki, Martina Schön, Michail Styllas, Virgina Tadei, Matteo Tolosano and Tom J. Battin (2022). Benthic biofilms in glacier-fed streams from Scandinavia to the Himalayas host distinct bacterial communities compared with the streamwater. *Appl. Environ. Microbiol.* Vol. 88, No. 12, doi:10.1128/aem.00421-22.

36. Tyler J. Kohler, Stilianos Fodelianakis, Grégoire Michoud, Leïla Ezzat, Massimo Bourquin, Hannes Peter, **Susheel Bhanu Busi**, Paraskevi Pramateftaki, Nicola Deluigi, Michail Styllas, Matteo Tolosano, Vincent De Staercke, Martina Schön, Jade Brandani, Ramona Marasco, Daniele Daffonchio, Paul Wilmes and Tom J. Battin (2022). Glacier shrinkage will accelerate downstream decomposition of organic matter and alters microbiome structure and function. *Global Change Biology, 00, 1– 14.* doi:10.1111/gcb.16169.

37. Bianca De Saedeleer, Antoine Malabirade, Javier Ramiro-Garcia, Janine Habier, Jean-Pierre Trezzi, Rashi Halder, Samantha L. Peters, Christian Jäger, **Susheel Bhanu Busi**, Cédric C. Laczny, Robert L. Hettich and Paul Wilmes (2021). Systematic characterization of gut microbiome-secreted molecules by integrated multi-omics. *ISME COMMUN. Volume 1, article number: 82.* doi:10.1038/s43705-021-00078-0.

38. Valentina Galata*, **Susheel Bhanu Busi***, Benoît Josef Kunath, Laura de Nies, Magdalena Calusinska, Rashi Halder, Patrick May, Paul Wilmes and Cédric Christian Laczny (2021). Synergistic effect of short- and long-read sequencing on functional meta-omics. *Briefings in Bioinformatics, Volume 22, Issue 6, November 2021, bbab330.* doi:10.1093/bib/bbab330

39. Aaron C. Ericsson, **Susheel Bhanu Busi**, Daniel J. Davis, Henda Nabli, David C. Eckhoff, Rebecca A. Dorfmeyer, Giedre Turner, Marcus J. Crim, Elizabeth C. Bryda (2021). Molecular and culture-based bacterial ecology in a zebrafish (Danio rerio) housing system during set-up and equilibration. *anim microbiome 3, 55.* doi:10.1186/s42523-021-00116-1.

40. Susana Martinez Arbas, **Susheel Bhanu Busi**, Pedro Queirós, Laura de Nies, Malte Herold, Patrick May, Paul Wilmes, Emilie E. L. Muller and Shaman Narayanasamy (2021). Challenges, Strategies, and Perspectives for Reference-Independent Longitudinal Multi-Omic Microbiome Studies. *Front. Genet. 12:666244.* doi:10.3389/fgene.2021.666244

41. Stilianos Fodelianakis, Alex D. Washburne, Massimo Bourquin, Paraskevi Pramateftaki, Tyler J. Kohler, Michail Styllas, Matteo Tolosano, Vincent De Staercke, Martina Schön, **Susheel Bhanu Busi**, Jade Brandani, Paul Wilmes, Hannes Peter and Tom J. Battin (2021). Microdiversity characterizes prevalent phylogenetic clades in the glacier-fed stream microbiome. *ISME J. 2022;16(3):666-675.* doi:10.1038/s41396-021-01106-6

42. **Susheel Bhanu Busi***, Laura de Nies*, Janine Habier, Linda Wampach, Joëlle V. Fritz, Anna Heintz-Buschart, Patrick May, Rashi Halder, Carine de Beaufort and Paul Wilmes (2021). Persistence of birth mode-dependent effects on gut microbiome composition, immune system stimulation and antimicrobial resistance during the first year of life. *ISME COMMUN. Volume 1, Article number: 8*

43. Laura de Nies, Sara Lopes, **Susheel Bhanu Busi**, Valentina Galata, Anna Heintz-Buschart, Cedric Christian Laczny, Patrick May and Paul Wilmes (2021). PathoFact: a pipeline for the prediction of virulence factors and antimicrobial resistance genes in metagenomic data. *Microbiome 9:49.* doi:10.1186/s40168-020-00993-9

44. Varun Paul, Yogaraj Banerjee, Prosenjit Ghosh and **Susheel Bhanu Busi** (2020). Depthwise microbiome and isotopic profiling of a moderately saline microbial mat in a solar saltern. *Scientific Reports volume 10, Article number: 20686*

45. Kayla C. Banks, Elizabeth A. Giuliano, **Susheel Bhanu Busi**, Carol R. Reinero and Aaron C. Ericsson (2020). Evaluation of Healthy Canine Conjunctival, Periocular Haired Skin, and Nasal Microbiota Compared to Conjunctival Culture. *Front. Vet. Sci., 27.* doi:10.3389/fvets.2020.00558

46. Tyler J. Kohler, Hannes Peter, Stilianos Fodelianakis, Paraskevi Pramateftaki, Michail Styllas, Matteo Tolosano, Vincent de Staercke, Martina Schön, **Susheel Bhanu Busi**, Paul Wilmes, Alex Washburne and Tom J. Battin (2020). Patterns and Drivers of Extracellular Enzyme Activity in New Zealand Glacier-Fed Streams. *Front. Microbiol. 11:591465.* doi:10.3389/fmicb.2020.591465

47. **Susheel Bhanu Busi***, Paraskevi Pramateftaki*, Jade Brandani, Stilianos Fodelianakis, Hannes Peter, Rashi Halder, Paul Wilmes and Tom J. Battin (2020). Optimised biomolecular extraction for metagenomic analysis of microbial biofilms from high-mountain streams. *PeerJ 8:e9973.* doi:10.7717/peerj.9973

48. Jade E. Jones, **Susheel Bhanu Busi**, Jonathan B. Mitchem, James M. Amos-Landgraf and Michael Lewis (2018). Use of a tumor-targeting, near infrared fluorescent peptide for early detection and endoscopic resection of polyps in a rat model of colorectal cancer. *Molecular Imaging*, Jan. 2018, doi:10.1177/1536012118790065.

49. Daniel R. Montonye, Aaron C. Ericsson, **Susheel Bhanu Busi**, Cathleen Lutz, Keegan Wardwell and Craig L. Franklin (2018). Acclimation and Institutionalization of the Mouse Microbiota Following Transportation. *Front. Microbiol.* 9:1085. doi:10.3389/fmicb.2018.01085.

50. Sarah Hansen, Marcia Hart, **Susheel Bhanu Busi**, Taybor Parker, Angela Goerndt, Kevin Jones, James Amos-Landgraf and Elizabeth Bryda (2016). Fischer-344 *Tp53*-knockout rats

exhibit a high rate of bone and brain neoplasia with frequent metastasis. *Disease Models and Mechanisms 9(10):1139-1146.*

51. Daniel Davis, Holly Doerr, Agata Grzelak, **Susheel Bhanu Busi**, Eldin Jasarevic, Aaron Ericsson and Elizabeth Bryda (2016). *Lactobacillus plantarum* attenuates anxiety-related behavior and protects against stress-induced dysbiosis in adult zebrafish. *Scientific Reports 6, Article number: 33726.*
52. Aaron C. Ericsson, Sadia Akter, Marina M. Hanson, **Susheel Bhanu Busi**, Taybor W. Parker, Rebecca J. Schehr, Miriam A. Hankins, Carin E. Ahner, Justin W. Davis, Craig L. Franklin, James M. Amos-Landgraf and Elizabeth C. Bryda (2015). Differential susceptibility to colorectal cancer due to naturally occurring gut microbiota. *Oncotarget, 6(32), 33689-33704.*
53. Marina McCoy, Aaron Ericsson, Miriam Hankins, **Susheel Bhanu Busi**, Taybor Parker, Craig Franklin, James Amos-Landgraf, and Elizabeth Bryda (2015). The impact of the gut microbiota on phenotype following rederivation. *Transgenic Research 23(5):905-905.*

In Revision

1. **Susheel Bhanu Busi**, Kara De Leon, Judy Wall and James Amos-Landgraf (2022). Biofilm-producing sulfate-reducing bacteria suppress tumor burden in a rat model of human colon cancer. *NPJ Biofilms and Microbiomes.*

2. **Susheel Bhanu Busi**, Daniel Davis, Jacob Moskowitz and James Amos-Landgraf (2022). Shift from a Simplified to Complex Gut Microbiota Reduces Adenoma Burden in a Preclinical Rat Model of Colon Cancer. *Scientific Reports.*

In Scriptum

1. Massimo Bourquin, **Susheel Bhanu Busi**, Grégoire Michoud, Paul Wilmes and Tom Battin (*in scriptum*). Selective genome sweeps indicate genome streamlining in *Hydrurus* spp.-associated *Polaromonas* in high alpine glacier-fed streams.
2. **Susheel Bhanu Busi**, Daniel Davis, Daniel Royce Montonye, Sarah Hansen and James Amos-Landgraf (*in scriptum*). Treatment with *Prevotella copri* and *Fusobacterium nucleatum* subsp. *Polymorphum* alleviates tumor burden in the Pirc rat model of familial adenomatous polyposis.

BOOK CHAPTERS

Aaron C. Ericsson, **Susheel Bhanu Busi**, and James Amos-Landgraf (2019). Characterization of the Rat Gut Microbiota via 16S rRNA Amplicon Library Sequencing. *Methods in Molecular Biology 2018:195-212.* doi:10.1007/978-1-4939-9581-3_9

WHITE PAPERS/REPORTS

Massimo Bourquin, **Susheel Bhanu Busi**, Anita Durr, Natasa Krčo. (2020). *Report*. Benchmarking Machine Learning Methods for Eukaryote/Prokaryote Contigs Classification. *École polytechnique fédérale de Lausanne*

PATENTS

Susheel Bhanu Busi, Jhy-Jhu Lin. (2016). *Patent*. High Temperature, Resistant Probiotics for Food and Feed Preparations. *United States Patent and Trademark Organization (USPTO) No. 9289008 (Publication No. US2016019325A1)*

SELECTED ABSTRACTS, WORKSHOPS AND PRESENTATIONS

1. **Busi S**, de Nies L, Battin TJ and Wilmes P (2022). Glacier-fed stream biofilms harbour diverse resistomes and biosynthetic gene clusters. Poster presentation, 18th *International Symposium on Microbial Ecology, Lausanne, Switzerland.*
2. **Busi S**, Bourquin M, Fodelianakis S, Wilmes P and Battin T (2022). Biological warfare in glacier-fed streams. **Platform presentation**, *5th Annual Luxembourg Microbiology Day, Esch-sur-Alzette, Luxembourg.*
3. **Busi S**. Laboratory Leadership for Postdocs. *EMBO Workshop*. June 8 -10. (2022). *Leimen/ Heidelberg, Germany.*
4. **Busi S**, Galata V, Wilmes P and Battin T (2021). Adaptive genomic and metabolic traits influence microbial islands of life in alpine streams. **Platform presentation**, *4th Annual Luxembourg Microbiology Day, Esch-sur-Alzette, Luxembourg.*
5. **Busi S**, de Nies L, Martinez Arbas S and Wilmes P (2021). Differential transmission of AMR by Mobile Genetic Elements in Wastewater Treatment plants. **Platform presentation**, *International Human Microbiome Congress, Barcelona, Spain.*
6. **Busi S** and Wilmes P (2021). Potential of nutrition and metabolomics research in metagenomics studies. **Invited speaker**, *First International Conference on Precision Nutrition and Metabolism in Public Health, Rhodes, Greece.*
7. **Busi S**, de Nies L, Habier J, Wampach L, Heintz-Buschart A, de Beaufort C and Wilmes P (2019). The effect of birth mode on gut microbiome composition, immune system stimulation and antimicrobial resistance during the first year of life. **Platform presentation**, *EMBO|India Human Microbiome: Health and Disease conference, Kalyani, India.*
8. **Busi S**, Wilmes P and Battin T (2019). Biofilms: a Metagenomic Perspective of Alpine Glacier-Fed Streams. **Platform presentation**, *16th Symposium on Aquatic Microbial Ecology (SAME16), Potsdam, Germany.*
9. **Busi S**, De Leon K, Wall J and Amos-Landgraf JM (2018). Biofilm-producing sulfate-reducing bacteria suppress tumor burden in a rat model of colon cancer. **Platform presentation**, *American Association of Cancer Research (AACR) Annual Meeting, Chicago, IL.*

10. **Busi S**, Lei Z, Sumner L and Amos-Landgraf JM (2018). Complex gut microbiota modulate rat colon adenoma susceptibility, metabolites, and host gene expression. Poster presentation, *American Association of Cancer Research (AACR) Annual Meeting, Chicago, IL.*

11. **Busi S**, De Leon K, Wall J and Amos-Landgraf JM (2017). Suppression of tumor growth using biofilm producing sulfate-reducing bacteria in a rat model of colon cancer. **Platform presentation**, *Keystone Symposia J8: 6.*

12. **Busi S** (2017). Strategies and Techniques for Analyzing Microbial Population Structure. Summer workshop, *Marine Biological Laboratory (MBL), Woods Hole, MA.*

13. **Busi S**, Ericsson A, Parker T, Franklin C, Amos-Landgraf JM and Bryda EC (2016). Adenoma Susceptibility Modulated by Variable Complex Gut Microbiota in a Rat Model of Familial Colon Cancer. **Platform presentation**, *The Allied Genetic Conference (TAGC): PgmNr M299.*

14. Franklin C, Hart M, Ericsson A, **Busi S**, Moskowitz J, Amos-Landgraf J, and Bryda E. (2016). Complex Microbiota Targeted Rederivation: a Tool for Assessing the Role of Complex Microbiota in Rodent Model Refinement and Reproducibility. Poster presentation, *Comparative Medicine Resource Directors Meeting, Bethesda, MD.*

15. Davis DJ, **Busi S**, Hart ML, Gillespie C, Amos-Landgraf JM, Franklin C, Ericsson A and Bryda EC. (2016). Influences of the gut microbiota on animal models of multiple species. Poster presentation, *International Society of Transgenic Technologies, Prague, Czechoslovakia.*

16. Amos-Landgraf JM, **Busi S**, Ericsson A, McCoy MH, Parker T, Schehr R, Hankins M, Franklin C, and Bryda EC (2015). Modulating disease susceptibility in a model of human colon cancer by microbiome rederivation. Poster presentation, *Cancer Research 75(15 Supplement):2880-2880.*

TEACHING EXPERIENCE

Global Environmental Change in the Anthropocene November 2022 – present
Geography and Spatial Planning, University of Luxemboourg

Veterinary Research Scholars Program May 2014 – 2018
Veterinary Pathobiology, University of Missouri

American Society of Laboratory Animal Practitioners Summer Program May 2014 – 2018
Veterinary Pathobiology, University of Missouri

MICROB 3200: Medical Microbiology and Immunology January 2015 – April 2015
School of Medicine, University of Missouri

MICROB 2800: Medical Microbiology and Immunology August 2014 – December 2014
School of Medicine, University of Missouri

PROFESSIONAL AFFILIATIONS

Luxembourg Society of Microbiology	2019 – present
University of Missouri Alumni Association	2018 – present
American Association of Cancer Research	2014 – present
International Mammalian Genome Society	2016 – 2018
Genetics Society of America	2016 – 2017
Molecular Pathogenesis and Therapeutics Graduate Council	2014 – 2018

ACADEMIC/INSTITUTIONAL AFFILIATIONS

External Collaborators

Aaron C. Ericsson, Daniel Davis, Elisabeth Bryda and Craig Franklin (University of Missouri, Columbia), Varun Paul (Mississippi State University, Starkville), Parag Vaishampayan (Biotechnology and Planetary Protection Group, Jet Propulsion Laboratory, NASA, California Institute of Technology, California), Prosenjit Ghosh (Indian Institute for Science, Bengaluru, India), Yogaraj Banerjee (Indian Institute for Science, Bengaluru, India), Carine de Beaufort (Centre Hospitalier de Luxembourg, Luxembourg), Elisabeth Letellier (Department of Life Sciences and Medicine, Luxembourg), Alex Probst (University of Duisburg-Essen, Germany), Jens Kallmeyer (GeoForschungs Zentrum, Potsdam), Kara De Leon (University of Oklahoma, Norman), Tom Battin (École polytechnique fédérale de Lausanne, Lausanne), Alex Washburne (Selva Analytics, Montana), Anupam Sengupta (Physics of Living Matter group, University of Luxembourg, Kirchberg), Robert Finn (European Molecular Biology Laboratory), Christopher Quince (Earlham Institute).

Student Mentorship (*graduated)

Julia Ortis Sunyer (PhD), Malte Herold (PhD*), Susana Martinez Arbas (PhD*), Laura de Nies (PhD*), Bianca de Saedleer (PhD), Catherine Sedrani (PhD*), Polina Novikova (MS* and PhD), Massimo Bourquin (PhD), Jade Brandani (PhD*), Zachary McAdams (PhD), Cedric Luna (MS*), Samaaneh Moezzi (MS*), Eunice Alorgbey (MS*)

Dissertation/Thesis Committee Member

Marianne Meyers (MS and PhD, Microbiota and cancer cell crosstalk)

Undergraduate Research Advisor

Nathaniel George (Health and Data Sciences), Brandon Kellogg (Molecular Microbiology), Julia Podolan (Molecular Microbiology), Emma Weeda (Molecular Microbiology)

SYNERGISTIC AND OUTREACH ACTIVITIES

- Chercheurs à l'école: July 2021

Middle to High school level outreach event at the International School of Luxembourg

- Chercheurs à l'école: August 2019
  Middle to High school level outreach event at the International School of Luxembourg

- Judge for Life Sciences Day July 2018
  Undergrad category, University of Missouri-Columbia

- Judge for Life Sciences Day April 2017
  Undergrad category, University of Missouri-Columbia

- Journal Reviewer
  - Nature Communications, Nature Microbiology, ISME, Microbiome, Astrobiology, PLOS Biology, Briefings in Bioinformatics, Water Research, mBio, mSystems, eLife, Frontiers in Microbiology, Communications Biology, Cell Host & Microbe, NPJ Biofilms & Microbiome.

AWARDS AND HONORS

Best Oral Presentation – Postdoc **July 2021**
4th Annual Luxembourg Microbiology Day; *Luxembourg Society of Microbiology; Esch-sur-Alzette, Luxembourg*

Outstanding Oral Presentation **November 2019**
Human Microbiome: Health and Disease conference; *EMBO Symposium; Kalyani, India*

Best Poster Award **August 2019**
16th Annual Conference: *Symposium of Aquatic and Microbial Ecology; Potsdam, Germany*

People's Choice Award **April 2018**
3-Minutes Thesis (3MT) Competition Finals; *Midwestern Association of Graduate Schools (MAGS)*

MU Professional Presentation Award **April 2018**
Office of Graduate Studies; *University of Missouri*

AACR-Get Your Rear in Gear Philadelphia Scholar-in-Training Award **February 2018**
2018 Annual Meeting, *American Association of Cancer Research; Chicago, IL*

Second place **February 2018**
3-Minutes Thesis (3MT) Competition Finals; *Conference of Southern Graduate Schools (CSGS)*

Mizzou 18 Inaugural Class Inductee **February 2018**
Mizzou Alumni Association, *University of Missouri*

First place and People's Choice Awards **December 2017**

3-Minutes Thesis (3MT); *University of Missouri*

Strategies and Techniques for Analyzing Microbial Populations Travel Grant **July 2017**
Marine Biological Laboratory, University of Chicago

CVM Research Day: 1st place **May 2017**
Advanced residents, Graduate students and Post-docs; *College of Veterinary Medicine University of Missouri*

Missouri Life Sciences Week: Most Creative Research **April 2017**
Organismal Biology, *University of Missouri*

34th Annual Research and Creative Activities Forum: 1st place **March 2017**
Health Sciences, Medicine & Veterinary Medicine; *University of Missouri*

The Allied Genetics Conference (TAGC) Travel Award **July 2016**
International Mammalian Genome Society (IMGS)

CVM Research Day: 3rd place **May 2016**
2nd, 3rd year residents and Graduate students and Post-docs; *College of Veterinary Medicine University of Missouri*

33rd Annual Research and Creative Activities Forum: 1st place **February 2016**
Health Sciences, Medicine & Veterinary Medicine; *University of Missouri*

MU Phi Zeta Research Grant **December 2015**
College of Veterinary Medicine, *University of Missouri*

MU Phi Zeta Research Day: 2nd place **May 2015**
2nd and 3rd year residents and Graduate students; *College of Veterinary Medicine University of Missouri*

Outstanding Graduate Student Award **May 2012**
Biomedical Science Program, *Hood College*

REFERENCES

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