William T. Scott Jr. **Ph.D.**

Research Assistant Professor · Computational Systems Biology and Biotechnology

Purdue University, 610 Purdue Mall, West Lafayette, IN, 47907, United States

+1 775 606 2453 | wtscott@purdue.edu | williamtscottjr

Professional Summary

A dynamic and accomplished computational systems biologist with extensive expertise in genome-scale metabolic modeling, microbial community dynamics, and synthetic biology. With a proven track record of publishing in high-impact journals and delivering invited talks at prestigious conferences, I excel in bridging the gap between theoretical modeling and practical biotechnological applications.

As an Assistant Professor of AI & Modeling in OneHealth in the Department of Agricultural and Biological Engineering at Purdue University, I lead a research program focused on metabolic modeling, microbial consortium design, and the application of synthetic biology for food, health, and bioproduct innovations. My work emphasizes engineering microbial systems to enhance the production of foods, nutriceuticals, and biochemicals, while fostering interdisciplinary collaborations across Purdue, including with Food Science and Discovery Park. In this role, I also mentor undergraduate and graduate students, as well as postdocs, in computational systems biology and metabolic engineering.

With an academic foundation in chemical engineering and a deep understanding of microbial systems, I bring a unique perspective to tackling pressing global issues, from sustainable bioenergy production to improving food and health-related microbiomes. I remain committed to advancing the frontiers of metabolic engineering through innovative research and impactful collaboration.

Education

University of California, Davis (UC Davis) *Davis, CA, USA*

Doctor of Philosophy (Ph.D.) in Chemical Engineering (Biotechnology Emphasis) *Jun. 2021*

- **Advisors:** Dr. David E. Block (UC Davis), Dr. Eddy J. Smid (WUR), and Dr. Richard A. Notebaart (WUR).
- **Thesis Title:** *The Impact of Saccharomyces cerevisiae Metabolism on Enological Fermentation Performance: A Systems Biology Approach.*
- Developed genome-scale metabolic models to study yeast metabolism and aroma production in enological conditions.
- Published four peer-reviewed articles and presented findings at international conferences.

North Carolina State University *Raleigh, NC, USA*

Master of Science (M.S.) in Chemical Engineering *Dec. 2013*

- **Advisor:** Dr. Saad Khan.
- Conducted research on biopolymer processing and material behavior using advanced computational modeling.
- Presented work at regional symposiums and contributed to departmental initiatives.

University of Arkansas *Fayetteville, AR, USA*

Bachelor of Science (B.S.) in Chemical Engineering *Aug. 2011*

- **Advisor:** Dr. Ed Clausen.
- Completed a senior design project focused on sustainable chemical processes, earning departmental recognition.
- Gained hands-on experience in laboratory methods, including distillation, chromatography, and reactor design.

University of Arkansas *Fayetteville, AR, USA*

Bachelor of Science (B.S.) in Biological Engineering *Aug. 2011*

- **Advisor:** Dr. Marty Matlock.
- Specialized in environmental systems modeling and water resource management.
- Completed a capstone project on sustainable agricultural practices, earning high honors.

Professional Experience

Department of Agricultural and Biological Engineering, Purdue University *West Lafayette, IN, USA*

Research Assistant Professor *Aug. 2025 – Present*

- Leading a research program in metabolic modeling, designing microbial consortia, and applying synthetic biology for food, health, and bioproduct applications.
- Engineering microbial systems to enhance production of food, pharmaceuticals, and biochemicals.
- Building interdisciplinary collaborations across Purdue, including Food Science and Discovery Park.
- Mentoring undergraduate, graduate students, and postdocs in computational systems biology and metabolic engineering courses and research projects.

Laboratory of Systems and Synthetic Biology and UNLOCK: Large-scale open infrastructure for microbial research, Wageningen University & Research *Wageningen, The Netherlands*

Postdoctoral Researcher *Sep. 2021 – Aug. 2025*

- Developed advanced genome-scale metabolic models to optimize microbial consortia for biotechnological applications.
- Coordinated the UNLOCK platform for microbial community research, fostering interdisciplinary collaboration.
- Published seven peer-reviewed articles in high-impact journals, including *The ISME Journal* and *BMC Microbiome*.
- Designed and implemented computational pipelines to analyze microbial interactions and community dynamics.
- Mentored graduate students, leading to successful thesis completions and co-authored publications.

Laboratory of Food Microbiology, Wageningen University & Research *Wageningen, The Netherlands*

Visiting Researcher *Nov. 2019 – Aug. 2021*

- Investigated microbial dynamics in food fermentation systems using multi-omics approaches.
- Collaborated with industry partners to translate research findings into scalable bioprocesses.
- Presented research at international conferences, increasing visibility for collaborative projects.

Department of Chemical Engineering, University of California, Davis *Davis, CA, USA*

Graduate Research Assistant *Sep. 2016 – Mar. 2021*

- Led a multi-year project on metabolic modeling to predict aroma production in wine fermentation.
- Constructed and validated genome-scale metabolic models for *Saccharomyces cerevisiae* under enological conditions.
- Published three first-author articles and presented findings at major conferences, such as AIChE and ASEV.
- Collaborated with interdisciplinary teams, bridging computational biology and traditional fermentation sciences.

Cacaolab bvba *Evergem, Belgium*

Technical Coordinator and Researcher *Apr. 2015 – Aug. 2015*

- Optimized cocoa fermentation processes to improve flavor profiles for premium chocolate production.
- Analyzed microbial and chemical data to identify critical control points in fermentation workflows.
- Liaised with production teams to implement research findings in commercial operations.

Department of Chemical Engineering, Ghent University *Ghent, Belgium*

Researcher *Nov. 2011 – May 2013*

- Conducted research on polymer processing and catalytic reactions for bio-based materials.
- Performed kinetic modeling of polymerization processes to predict product properties.
- Collaborated with academic and industry partners on EU-funded research initiatives.

Publications

** corresponding author, +co-first author*

Peer-Reviewed Publications

Tan Y, Zhu T, Wijffels RH, Xu Y, **Scott WT**, dos Santos VM. Controlling metabolic stability of food microbiome for stable indigenous liquor fermentation. *npj Biofilms and Microbiomes*. 2025. DOI: 10.1038/s41522-025-00729-3.

Lesiczka P, Azagi T, Krawczyk AI, **Scott WT**, Dirks R, Šimo L, Dobler G, Nijsse B, Sprong H, Schaap PJ, Koehorst JJ. Deep sequencing of 16 *Ixodes ricinus* specimens unveils insights into their interactions with endosymbionts. *mSystems*. 2025. DOI: 10.1128/msystems.00507-25.

Scott WT*, Rockx S, Mariën Q, Regueira A, Candry P, Ganigué R, Koehorst JJ, Schaap PJ. Implementation of a *Clostridium luticellarii* genome-scale model for upgrading syngas fermentations. *Computational and Structural Biotechnology Journal*. 2025. DOI: 10.1101/2024.11.26.625427.

Dell'Olio A, **Scott WT**, Taroncher-Ferrer S, San Onofre N, Soriano J, Rubert J. Tailored impact of dietary fibers on gut microbiota: A multi-omics comparison on lean and obese microbial communities. *Microbiome*. 2024. DOI: 10.1186/s40168-024-01975-x.

Ioannou A, Berkhout M, **Scott WT**, Blijenberg B, Schaap PJ, Boeren S, Mank M, Knol J, Belzer C. Resource sharing of an infant gut microbiota synthetic community in combinations of human milk oligosaccharides. *The ISME Journal*. 2024. DOI: 10.1093/ismejo/wrae209.

Zhang C, Sánchez BJ, Li F, Cheng E, Quan W, Mendoza Farías S, Liefbal U, LM Blank, Menger H, **Scott WT**, Anton M, Tafur Rangel A, Zhang L, Nielsen J, Lu H, Kerkhoven EJ. Yeast9: a consensus genome-scale metabolic model for *S. cerevisiae* curated by the community. *Molecular Systems Biology*. 2024. DOI: 10.1038/s44320-024-00060-7.

Atasoy M, **Scott WT**+, Regueira A, Schaap PJ, Smidt H. Biobased short chain fatty acid production: Exploring microbial community dynamics and metabolic networks through kinetic and microbial modeling approaches. *Biotechnology Advances*. 2024. DOI: 10.1016/j.biotechadv.2024.108363.

Scott WT*+, Benito-Vaquerizo S, Zimmerman J, Bajic D, Heinken A, Suarez-Diez M, Schaap PJ. A structured evaluation of genome-scale constraint-based modeling tools for microbial consortia. *PLOS Computational Biology*. 2023. DOI: 10.1371/journal.pcbi.1011363.

Scott WT*, Henriques D, Smid EJ, Notebaart RA, Balsa-Canto E. Dynamic genome-scale modeling of *Saccharomyces cerevisiae* unravels mechanisms for ester formation during alcoholic fermentation. *Biotechnology and Bioengineering*. 2023. DOI: 10.1002/bit.28421.

Atasoy M, **Scott WT**, van Gijn K, Koehorst JJ, Smidt H, Langenhoff AAM. Microbial dynamics and bioreactor performance: The linkage for effective organic matter removal from wastewater treatment plant effluent. *Bioresource Technology*. 2023. DOI: 10.1016/j.biortech.2023.128659.

dos Santos VM, Anton M,..., **Scott WT**,..., Zupanic A, Evelo CT, Hancock JM. Systems Biology in ELIXIR: Modelling in the spotlight. *F1000Research*. 2022. DOI: 10.12688/f1000research.126734.2.

Scott WT, Smid EJ, Block DE, Notebaart RA. Metabolic flux sampling predicts strain-dependent differences related to aroma production among commercial wine yeasts. *Microbial Cell Factories*. 2021. DOI: 10.1186/s12934-021-01694-0.

Scott WT, van Mastrigt O, Block DE, Notebaart RA, Smid EJ. Nitrogenous compound utilization and production of volatile organic compounds among commercial wine yeasts highlight strain-specific metabolic diversity. *Microbiology Spectrum*. 2021. DOI: 10.1128/Spectrum.00485-21.

Scott WT, Smid EJ, Notebaart RA, Block DE. Curation and analysis of a *Saccharomyces cerevisiae* genome-scale metabolic model for predicting production of sensory impact molecules under enological conditions. *Processes*. 2020. DOI: 10.3390/pr8091195.

Preprints and Manuscripts Under Review

Scott WT*, Nataya ED, Belzer C, Schaap PJ. Metabolic modeling unveils potential probiotic roles of *Flavonifractor plautii* in reshaping the Western gut microbiota landscape.*bioRxiv*. 2025. DOI: 10.1101/2025.04.16.649128.

Raman K, Kratochvíl M, Olivier B, ..., **Scott WT**, Koehorst JJ, Schaap PJ, ..., Malik-Sheriff RS. FROG Analysis ensures the reproducibility of genome-scale metabolic models. *bioRxiv*. 2024. DOI: 10.1101/2024.09.24.614797.

In Preparation

Scott WT*, Jácome LAP, Stouten G, Wang J, Nijsse B, Koehorst JJ, Edwards EA, Smidt H, Schaap PJ, Kleerebezem R. Unraveling the metabolic interactions of a *Dehalobacter*-containing anaerobic mixed microbial culture.

Scott WT, Martin IM, de Buck C, Schaap PJ, Metcalfe B, Suarez Diez M, Koehorst JJ. Standards and Best Practices for Developing Reproducible Genome-Scale Metabolic Models. In: Methods in Molecular Biology, Protocol Series: Flux Balance Analysis. Springer Nature.

Bonhof S, **Scott WT**, Suarez-Diez M, van Lingen HJ. Predicting ruminal volatile fatty acid and hydrogen production using a genome-scale metabolic model of *Prevotella ruminicola*.

Van Geerestein JI, Dell'Olio A, Fogliano V, **Scott WT**, Rubert J. Metabolic insights into *Megasphaera*: Deciphering its dual role in obesity through genome-scale modeling.

Scott WT, Atasoy M, Koehorst JJ, Njisse B, Kleerebezem R, Schaap PJ, Smidt H. Designing and optimizing synthetic microbial consortia using genome-scale DBTL for butyric acid production.

Hancock JM, **Scott WT**, Suarez Diez M, Bleker C, Zrimec J, Domingue E. Ten ways to make your systems biology models FAIRer (and CUREd?) (Elixir Community Paper)

Ke C, Koehorst JJ, Nijsse B, **Scott WT**, Schaap PJ. A metadata managed FAIR end-to-end workflow for microbial community Omics data analysis.

Scott WT, Schaap PJ, ..., Fleming RMT. COBRA v4 Toolbox Paper (Consensus Paper).

Awards, Fellowships, & Grants

2018	**GEM Fellowship**, National GEM Consortium	*$ 30,000*
	Andre Tchelistcheff and Dr. Richard Peterson Scholarship, American Vineyard Foundation	*$ 5,000*
2017	**American Society for Enology and Viticulture Scholarship**, American Society for Enology and Viticulture	*$ 2,000*
2016	**TOPS Fellowship**, UC Davis Department of Chemical Engineering	*$ 4,000*
2011	**2nd place G. B. Gunlogson Student Environmental Design Competition, Design of a System to Remove Algae from an Aquatic Area**, American Society of Agricultural and Biological Engineers (ASABE)	*$ 1,000*

Presentations

** presenting author; + mentored undergraduate*

Invited Talks

Scott WT. "Engineering the Perfect Pour: Metabolic Modeling in Beverage Fermentation and Biotech - Case Study Wine Fermentation and Future Outlook" Invited Research Seminar, February 2025, Bioprocess Engineering Technology, KU Leuven, Gent, Belgium.

Scott WT. "Advancing Metabolic Modeling: Applications in Biotechnology and Food Fermentation" Invited Research Seminar, January 2025, Agricultural & Biological Engineering and Food Science, Purdue University, West Lafayette, Indiana, United States.

Scott WT. "Genome-scale metabolic modeling tools for microbiomes." Invited Guest Lecturer for S2M2: Summer School in Metabolic Modeling, July 2024, University of Minho, Braga, Portugal.

Scott WT. "*In silico* Microbiome Modeling Tools." Invited Guest Lecturer for VLAG-MBDP graduate school course "Intestinal Microbiome of Humans and Animals," April 2023, Wageningen, The Netherlands.

Scott WT. "Assessment of Genome-Scale Constraint-Based Modeling Tools for Microbial Consortia." Bioinformatics @Wageningen Seminar Series, April 2023, Wageningen, The Netherlands.

Scott WT. "Lecture 19: Other Types of Models." Invited Guest Lecturer for Metabolic Engineering of Industrial Microorganisms (Bioprocess Engineering Course), March 2023, Wageningen, The Netherlands.

Scott WT, Block DE. "The Use of Genome-Scale Yeast Models to Understand Ethanol Tolerance and Volatile Formation during Enological Fermentation." Invited Seminar for VIB-KU Leuven Center for Microbiology, September 2018, Leuven, Belgium.

Contributed Presentations

Bonhof S,**Scott WT**, Suarez-Diez M, van Lingen HJ. "Predicting ruminal volatile fatty acid and hydrogen production using a genome-scale metabolic model of *Prevotella ruminicola*" ModNut 2025: Modelling Nutrient Digestion and Utilization in Farm Animals 2025, September 2025, Engelberg, Switzerland.

Scott WT, Koehorst JJ, Bajić D, Njisse B, Schaap PJ, Smidt H, Atasoy M*. "Genome-Scale Model-Based Design of Synthetic Communities for Carboxylic Acid Bioproduction" ECOSTP 2025: 7th IWA International Conference on Ecotechnologies for Wastewater Treatment, June 2025, Stockholm, Sweden.

Ke C*, Koehorst JJ, Nijsse B, **Scott WT**, Schaap PJ. "FAIR Microbial Omics: A Metadata-Driven Workflow Using Mock Communities." BioSB2025, May 2025, Baarlo, the Netherlands.

Lesiczka P*, Azagi T, Krawczyk AI, **Scott WT**, Dirks R, Šimo L, Dobler G, Nijsse B, Sprong H, Schaap PJ, Koehorst JJ. "Tick Tack Ticks – How deep can you go?" 16th International Symposium on Ticks and Tick-borne Diseases, March 2025, Jena, Germany.

Jácome LAP* and **Scott WT**. "Cultivation and characterization of anaerobic Dehalobacter-enriched microbial cultures that dechlorinate monochlorobenzene to benzene." Dehalobacter Jamboree (Edlab Quarterly Meeting), June 2024, University of Toronto, Toronto, Canada.

Langenhoff AAM*, Atasoy M, **Scott WT**, van Gijn K, Koehorst JJ, Smidt H. "Microbial dynamics and bioreactor performance are interconnected for organic matter removal from wastewater treatment plant effluent." 6th IWA International Conference on eco-Technologies for Wastewater Treatment, June 2023, Girona, Spain.

Scott WT*, Nijsse B, Schaap PJ, Koehorst JJ. ”FAIR Data Station.” NWO Life Conference 2023, May 2023, Egmond aan Zee, The Netherlands.

Scott WT*, Benito-Vaquerizo S, Zimmerman J, Bajic D, Heinken A, Suarez-Diez M, Schaap PJ. ”A Structured Evaluation of Genome-Scale Constraint-Based Modeling Tools for Microbial Consortia.” Dutch Bioinformatics & Systems Biology conference 2023 (BioSB 2023), May 2023, Egmond aan Zee, The Netherlands.

Scott WT. ”The State of the Art of Genome-Scale Constraint-Based Modeling Tools for Microbial Consortia.” UNLOCK Science Meeting, March 2023, Wageningen, The Netherlands.

Rockx S*+, Koehorst JJ, Schaap PJ, **Scott WT**. ”Creating a metabolic model of *Clostridium luticellarii* as a candidate for upgrading syngas fermentation.” Systems and Synthetic Biology Colloquium, January 2023, Wageningen, The Netherlands.

Scott WT. ”Dynamic and Spatio-temporal Genome-Scale Constraint-Based Modeling Tools for Microbial Consortia.” Systems and Synthetic Biology Seminar, January 2023, Wageningen, The Netherlands.

Scott WT. ”The use and potential of modeling microbial communities.” UNLOCK Quarterly Meeting, September 2022, Wageningen, The Netherlands.

Jácome LAP*, **Scott WT**, Stouten G, Nesbø CL, Edwards EA, Kleerebezem R. ”Unraveling the metabolic interactions of a *Dehalobacter*-containing anaerobic mixed microbial culture.” 18th International Symposium on Microbial Ecology (ISME 18), August 2022, Lausanne, Switzerland.

Scott WT. ”The use and potential of genome-scale metabolic models in food microbiology: Case study wine fermentation.” Computational Systems Biology Seminar, April 2022, Wageningen, The Netherlands.

Scott WT*, van Mastrigt O, Notebaart RA, Smid EJ, Block DE. ”Application of Robust Dynamic Flux Balance Analysis Framework to a Wine Fermentation for Understanding and Steering Aroma Formation.” AIChE National Meeting, November 2020, San Francisco, CA.

Arikal AO*, **Scott WT**, Miller K, Block DE. ”The Impact of Measuring the Biomass Composition of *Saccharomyces cerevisiae* to Predict Wine Fermentation Kinetics Using a Genome-Scale Model.” AIChE FOODIE Conference, December 2019, Philadelphia, PA.

Arikal AO*, **Scott WT**, Block DE. ”Importance of Measuring the Biomass Composition of *Saccharomyces cerevisiae* to Model Wine Fermentations Using a Genome-Scale Model.” American Society for Enology and Viticulture (ASEV) National Meeting, June 2019, Napa, CA.

Arikal AO, **Scott WT**, Ozcan A, Sánchez BJ, Nielsen J, Montpetit B, Cantu D, Block DE*. ”Understanding Yeast Strain Differences Through a Genome-Scale Modeling Approach.” Recent Advances in Viticulture and Enology (RAVE), UC Davis, November 2018, Davis, CA.

Scott WT*, Arikal AO, Ozcan A, Sánchez BJ, Nielsen J, Block DE*. ”The Use of Genome-Scale Yeast Models to Elucidate Mechanisms for Ethanol Tolerance.” UC Davis-Montpellier Joint Research Symposium, November 2018, Davis, CA.

Scott WT*, Arikal AO, Ozcan A, Block DE. ”Development of a Genome-Scale Metabolic Model for *Saccharomyces cerevisiae* to Facilitate Understanding of the Differences in Metabolism between Commercial Yeast Strains.” AIChE National Meeting, October 2018, Pittsburgh, PA.

Toloza Porras C*, **Scott WT**, D’hooge D, Reynie MF, Marin G. ”Modeling of expandable polystyrene and polyacrylamide kinetics: model accuracy and intrinsic kinetic parameters.” COOPOL and OPTICO dissemination event, 2013.

Teaching Experience

Intestinal Microbiome of Humans and Animals *Wageningen University*

Guest Lecturer *Period 4 (2023)*

- Introducing computational approaches for simulating microbial communities.
- Discussed modeling strategies and systems biology applications in gut microbiome research.

Metabolic Engineering of Industrial Microorganisms *Wageningen University*

Guest Lecturer *Period 3 (2023)*

- Delivered lectures on genome-scale metabolic modeling and its application in industrial microorganisms.
- Facilitated discussions on emerging trends in metabolic engineering.

Advanced Systems Biology *Wageningen University*

Teaching Assistant *Period 4 (2022)*

- Assisted in course preparation, including developing instructional materials.
- Facilitated practical sessions to help students implement systems biology concepts.
- Provided one-on-one and group support to students during project work.

Modeling in Systems Biology *Wageningen University*

Teaching Assistant *Period 2 (2022)*

- Supported students in learning dynamic modeling techniques in systems biology.
- Conducted tutorials on computational tools such as MATLAB and Python.
- Evaluated student assignments and provided constructive feedback.

Mentoring

2024–2025	**Dea Nataya Enden**, Master's Student Researcher, Bioinformatics, Wageningen University & Research
2024	**Peiyi Lu**, Master's Student Researcher, Molecular Biology, Wageningen University & Research
2023–2024	**Joy van Geerestein**, Master's Student Researcher, Food Quality and Design, Wageningen University & Research (Unofficial Co-supervisor)
2023	**Sam Bonhof**, Bachelor's Student Researcher, Bioinformatics, Wageningen University & Research
2022–2023	**Siemen Rockx**, Master's Student Researcher, Systems and Synthetic Biology, Wageningen University & Research
2020–2021	**Pol Torrent**, Master's Student Researcher, Food Microbiology, Wageningen University & Research (Unofficial Co-supervisor)
2019–2020	**Andrea DellOlio**, Master's Student Researcher, Food Microbiology, Wageningen University & Research (Unofficial Co-supervisor)
2017–2018	**Arman Riahi**, Undergraduate Research Assistant, Biochemical Engineering, University of California Davis

Outreach & Professional Development

Service and Outreach

2025–2026	**Gut Microbes**, Guest Advisor, Special Issue: Modelling Gut Microbiota
2024	**UNLOCK Symposium**, Workshop Organizer
2023	**UNLOCK Symposium**, Workshop Organizer
2023	**BioSB 2023 Conference**, Poster Competition Judge
2022-2023	**WUR Systems and Synthetic Biology Group**, Guest Seminar Organizer
2022-2023	**UNLOCK**, Guest Seminar Organizer
2016-2018	**Black Graduate Engineering & Science Students**, Committee Member

Development

X-omics Festival 2023, Radboud University, April 2023, Nijmegen, The Netherlands.

Evolution in and of Cell Communities Symposium, Vrije Universiteit Amsterdam, February 2023, Amsterdam, The Netherlands.

Fluxomics Training School, ELIXIR, The European Research Infrastructure for biological data, Institute of Chemical Engineering, August 2021, Patras, Greece.

Peer Review

Nature Communications

Microbial Biotechnology

Food Microbiology
Biotechnology for Biofuels and Bioproducts
ISME Communications
Computational and Structural Biotechnology Journal
Scientific Reports
International Journal of Food Microbiology
Processes
PlosOne
npj Science of Foood
Discover Applied Science
Frontiers in Immunology
International Biodeterioration & Biodegradation

Professional Memberships

Elixir Europe - Systems Biology
Elixir Europe - Microbial Biotechnology
American Institute of Chemical Engineers (AIChE)
American Society of Agricultural and Biological Engineers (ASABE)