Curriculum Vita 2018-2023

Tanya E. S. Dahms
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Education

1991-1995 Ph. D., Biochemistry and Biophysics, University of Ottawa, Ottawa, Canada
1985-1990 B. Sc. Co-op, Biology and Chemistry, University of Waterloo, Waterloo, Canada

Academic, Research and Industrial Experience

2022-present Associate Dean Research, Faculty of Science (Fac Sci), University of Regina (UofR)
1999-present Biochemistry Professor, Dept. of Chemistry and Biochemistry, Fac Sci, UofR
2017-2020 Research Associate, Regina Qu'Appelle Regional Health Authority
2011 Environmental Testing Agent, Mainstream Water Solutions, Regina, SK
1998-1999 NSERC Visiting Fellow in a Canadian Government Laboratory, Steacie Institute, National Research Council Canada
1996-1998 NSERC Postdoctoral Fellow, Department of Biological Sciences, Purdue University, West Lafayette, United States
1992-1993 Junior Consultant to Environment Canada, Sypher:Müller Inc., Ottawa, ON, CA
1991-1992 Consultant, Avestin Inc., Ottawa, ON, CA

Honours and Invited Activities

2021 – Natural Science and Engineering Research Council (NSERC) Evaluation Group (EG) 1601, Member
2011 – Dutch Research Council, NSERC CRD/DG, Hong Kong HMRF, External grant review
2017 – 2019 Saskatchewan Health Research Foundation (SHRF) Biomedical Grant Selection Committee (GSC), Chair
2018 NSERC EG 1501, Virtual member
2016 YWCA Women of Distinction Award, Recipient
2014 Canadian Cancer Society Award, Recipient
2012 – 2014 SHRF Biomedical GSC, Member
2011 President's Teaching and Learning Scholar Award, Recipient
2008 – 2011 NSERC EG 1501, Member
2004 Minister of Health Round Table: "Future of health research in Saskatchewan, Member
2001-2003 Health Sciences Utilization and Research Council Grant Selection Committee, Member
2002 National Institutes of Health, Visiting fellow
2001 Astra-Zeneca/ Canadian Society for Chemistry Research Award, Recipient

Scientific Peer-Reviewed Publications (Trainees in bold, *corresponding author(s))

1. **Ndlovu E.**, Malpartida L., **Sultana T.**, Dahms T. E. S.*, Dague E. * (2023) Host cell geometry and cytoskeletal organization governs *Candida*-host cell interactions at the nanoscale. *ACS Applied Materials and Interfaces* 15, 50789–50798. https://doi.org/10.1021/acsami.3c09870

2. **Shahina Z**., Yennamalli M. R.*, and. Dahms T.E.S.* (2023) Key essential oil components delocalize *Candida albicans* Kar3p and impact microtubule structure. *Microbiological Research* 272, 127373. https://doi.org/10.1016/j.micres.2023.127373

Scientific Peer-Reviewed Publications *continued*

3. **Shahina Z**., and Dahms T.E.S.* (2023) A simple and reproducible stereomicroscopic method to assess fungal biofilms: application to antifungal susceptibility testing. *Bio protocol* 13:e4713. https://doi.org/10.21769%2FBioProtoc.4713

4. **Acuna E**, **Ndlovu E**, **Molaeitabari A**, **Shahina Z***, Dahms TES*. (2023). Carvacrol-induced vacuole dysfunction and morphological consequences in *Nakaseomyces glabratus* and *Candida albicans. Microorganisms* 11, 2915. https://doi.org/10.3390%2Fmicroorganisms11122915

5. **Shahina Z.**, **Molaeitabari A.**, **Sultana T.***, Dahms T. E. S.* (2022) Cinnamon leaf and clove essential oils are potent inhibitors of *Candida albicans* virulence traits. *Microorganisms* Special Issue: *Candida* spp. and Their Virulence. 10, 1989. (Invited) https://doi.org/10.3390/microorganisms10101989

6. **Shahina Z**., **Ndlovu E.**, **Persaud O.**, **Sultana T.**, Dahms T.E.S.* (2022). *Candida albicans* reactive oxygen species (ROS)-dependent lethality and ROS-independent hyphal and biofilm inhibition by eugenol and citral. *Microbiol Spectr*;10(6):e0318322. https://doi.org/10.1128/spectrum.03183-22

7. **Shahina Z**., Al Homsi R., **Price J.D.W.**, Whiteway M., **Sultana T.**, Dahms T.E.S.* (2022). Rosemary essential oil and its components 1,8-cineole and α-pinene induce ROS-dependent lethality and ROS-independent virulence inhibition in *Candida albicans*. *PLoS One*;17(11):e0277097. https://doi.org/10.1371/journal.pone.0277097

8. **Shahina Z**., **Molaeitabari A.**, **Sultana T.**, Dahms T.E.S.* (2022). Cinnamon leaf and clove essential oils are potent inhibitors of *Candida albicans* virulence traits. *Microorganisms*; 10, 1989. https://doi.org/10.3390/microorganisms10101989

9. **Bhat S. V.**, **Price J. D. W.**, Dahms T. E. S.* (2021) AFM-based correlative microscopy illuminates human pathogens. *Frontiers in Cellular and Infection Microbiology* 11, 655501. https://doi.org/10.3389/fcimb.2021.655501

10. El-Baz A. M., Mosbah R. A., Goda R. M., Mansour B., **Sultana T.**, Dahms T. E. S., El-Ganiny A. M.* (2021) Back to Nature: Combating *Candida albicans* Biofilm, Phospholipase and Hemolysin Using Plant Essential Oils. *Antibiotics* 10(1):81. https://doi.org/10.3390/antibiotics10010081

11. **Jun D.**, **Idem U.**, Dahms T. E. S.* (2020) Altered envelope structure and nanomechanical properties of a C-terminal protease A-deficient *Rhizobium leguminosarum*. *Microorganisms* 8(9):1421. https://doi.org/10.3390/microorganisms8091421

12. Sharma K., **Sultana T.**, Dahms T. E. S., Dillon J.-A. R.* (2020) CcpN: a moonlighting protein regulating catabolite repression of gluconeogenic genes in *Bacillus subtilis* also affects cell length and interacts with DivIVA. *Canadian Journal of Microbiology* 66(12):723-732. https://doi.org/10.1139/cjm-2020-0022

13. Sharma K., **Sultana T.**, Liao M., Dahms T. E. S., Dillon J.-A. R.* (2020) EF1025, a hypothetical protein from *Enterococcus faecalis*, interacts with DivIVA and affects cell length and cell shape. *Frontiers in Microbiology* 11:83. https://doi.org/10.3389/fmicb.2020.00083

Scientific Peer-Reviewed Publications *continued*

14. Bakir G., Girouard B. E., Johns R. W., Findlay C. R.-J., Bechtel H. A., Eisele M., Kaminskyj S. G. W., Dahms T. E. S., Gough K. M.* (2019) Ultrastructural and SINS analysis of the cell wall integrity response of *Aspergillus nidulans* to the absence of galactofuranose. *The Analyst* 144:928-934. https://doi.org/10.1039/C8AN01591K

15 Brown P; RELISH Consortium, Zhou Y.* (2019) Large expert-curated database for benchmarking document similarity detection in biomedical literature search. *Database* (Oxford):baz085. https://doi.org/10.1093/database/baz085

16. Minic Z.*, Dahms T. E. S., Babu M. (2018) Chromatographic separation strategies for precision mass spectrometry to study protein-protein interactions and protein phosphorylation. *Journal of Chromatography B* 1102-1103:96-108. https://doi.org/10.1016/j.jchromb.2018.10.022

17. Atefi N., Vakil T., Abyat Z., Ramlochun S. K., Bakir G., Dixon I. M. C., Albensi B. C., Dahms T. E. S., Gough K. M.* (2018). Infrared spectroscopy: New frontiers both near and far. *Spectroscopy* 33(9): 34-38. https://www.spectroscopyonline.com/view/infrared-spectroscopy-new-frontiers-both-near-and-far

18. **Bhat S. V., Sultana T.,** Körnig A., **McGrath S. G. K., Shahina Z.** and Dahms T. E. S.***** (2018). Correlative atomic force microscopy quantitative imaging-laser scanning confocal microscopy quantifies the impact of stressors on live cells in real-time. *Scientific Reports* 8:8305. https://doi.org/10.1038/s41598-018-26433-1

19. **Shahina Z.**, El-Ganiny A. M., Minion J., Whiteway M., **Sultana T.**, and Dahms T. E. S.* (2018). *Cinnamomum zeylanicum* bark essential oil induces cell wall remodelling and spindle defects in *Candida albicans*. *Fungal Biology and Biotechnology* 5:3. https://doi.org/10.1186/s40694-018-0046-5

20. **Bhat S. V.**, **Kamencic B., Shahina Z.**, Körnig, A. and Dahms, T. E. S.* (2018) Exposure to sub-lethal 2,4-dichlorophenoxyacetic acid arrests cell division and alters cell surface properties in *Escherichia coli*. *Frontiers in Microbiology* 9:44 (IF 4.1). https://doi.org/10.3389/fmicb.2018.00044

21. **Jun A. D.**, Minic Z., **Bhat, S. V.**, Vanderlinde E. M., Yost C. Y., Babu M., and Dahms T. E. S.* (2018). Metabolic adaptation of C-terminal protease A-deficient *R. leguminosarum* in response to loss of nutrient transport. *Frontiers in Microbiology* 8:2617 (IF 4.1). https://doi.org/10.3389/fmicb.2017.02617

Invited Book Chapters (students in bold, *corresponding)

1. **Shahina Z., Bhat S. V., Ndlovu E., Sultana T.**, Körnig A., Dague É. and Dahms, T. E. S.* (2022) Cellulomics of live yeast by advanced and correlative microscopy. **In** Laboratory Protocols in Fungal Biology, Ed. V. Gupta, Springer, NY, USA. https://link.springer.com/chapter/10.1007/978-3-030-83749-5_9

Scientific Presentations (Students in bold, *invited)

Dahms, T. E. S., **Bhat, S. V.** (2023) High content cellulomics by correlative microscopy. 67th Biophysical Society, February 18-22, San Diego, California.

Dahms, T. E. S.*, Dague, E., Ndlovu E. (2022) Candida-host cell interactions are governed by human host cell cytoskeletal organization and geometry. Royal Microscopical Society, July 20-22 [Hybrid/Virtual presentation]

Dahms, T. E. S.* (2022) Panel on mechanical properties. Royal Microscopical Society, July 20-22 [Hybrid/Virtual presentation]

Dahms, T. E. S., **Shahina, Z.** (2022) Anti-virulence activity of plant-based antifungals through microtubule inhibition. 66th Biophysical Society, February 18-22 [Hybrid/Virtual presentation]

Dahms, T. E. S.* (2021) Assessing the impact of xenobiotics on live cells: correlative atomic-force laser scanning confocal microscopy assays. DU-PHARM 2021, Egypt, November, **Keynote**. [Virtual]

Dahms, T.E.S. * (2021) Correlative microscopy assays to quantify the impact of cell stressors in real-time. Department of Chemistry, University of Saskatchewan, November. [Virtual]

Dahms, T. E. S.*, **Bhat, S. V.** (2021) Correlative atomic force-laser scanning confocal microscopy quantifies the impact of cell stressors in real-time. Biophysical Society of Canada, May. [Virtual]

Bakir G., Dahms T. E. S., Martin-Yken H., Bechtel H., Gough K. (2021) Mid-infrared nanospectroscopic imaging of *Saccharomyces cerevisiae* cell walls. IUPAC World Chemistry Congress (WCC) and Canadian Chemistry Conference and Exhibition (CCCE), August. [Virtual]

Ndlovu E., Dague E., Dahms T. E. S.* (2021) Candida adhesion to human cancer cells is facilitated by cytoskeletal disruption, Biophysical Society, February. [Virtual]

Dahms, T. E. S.* (2020) Caregiving research associates and postdoctoral fellows: risk of pandemic eliminating future prospects. NSERC Leader Spotlight, NSERC Leader's meeting, October. [Virtual]

Ndlovu E., Dague E., Dahms T. E. S.* (2020) Candida adhesion to human cancer cells is facilitated by cytoskeletal disruption, Microscopical Society of Canada Symposium, June. [Virtual]

Bakir G., Dahms T. E. S., Martin-Yken H., Bechtel H., Gough K. (2020) Mid-infrared nanospectroscopic imaging of *Saccharomyces cerevisiae* cell walls. 103rd Canadian Society for Chemistry Conference, May. [Virtual]

Dahms T. E. S.* (2019) High-content correlative microscopy assays for assessing the impact of xenobiotics on live cells. XXVIII International Materials Research Congress Symposia, Cancun, Mexico, August. [Virtual]

Dahms T. E. S.* (2019) High-content correlative microscopy assays for assessing the impact of xenobiotics on live cells. 7th Annual Protein Structure Function and Malfunction Meeting, Saskatoon, Canada, June.

Dahms T. E. S.* (2019) Studying live cells inside and out with correlative microscopy. 7th Annual Canadian Cytometry and Microscopy Association Meeting, Edmonton, Canada, June.

Scientific Presentations *continued* (Students in bold, *invited)

Bakir G., Dahms T. E. S., Martin-Yken H., Bechtel H., Gough K. (2019) Near field infrared vibrational spectroscopy of *Saccharomyces cerevisiae* cell walls, Canadian Society for Chemistry, Québec City, Canada, June.

Bhat S.V., Booth S.C., **Kamencic B.C.**, Dahms T.E.S. (2019) Exposure to sub-lethal 2, 4-dichlorophenoxyacetic acid arrests cell division and alters cell surface properties in *Escherichia coli.* Canadian Society of Microbiology, Sherbrooke, Canada, June.

Sharma A., **Pierce A.**, Dahms T.E.S., Yost C. (2019) Transcriptional response of *Rhizobium leguminosarum* bv. *viciae* 3841 to exposure of 2,4-dichlorophenoxyacetic acid (2-4-D), Canadian Society of Microbiology, Sherbrooke, Canada, June.

Dahms, T. E. S.*, Körnig A., **Ndlovu E.,** Martin-Yken H. and Dague E. (2018) Deconstructing and reconstructing the yeast cell wall: A top-down, bottom-up approach. NANOinBio, Guadeloupe, May.

Bhat S.V., Haschke H., Körnig A., Dahms T. E. S.* (2018) Novel approach for studying the impact of xenobiotics on *Escherichia coli*. SPMonSPM, Leuven, Belgium, August.

Shahina, Z., Sultana, T., Dahms, T. E. S. (2018) Essential oils, cinnamon bark oil induces cell wall remodelling & spindle defects while rosemary oil inhibits germ tube formation by interrupting Hwp1 surface protein and cell cycle of *Candida albicans*. American Society for Microbiology conference on Candida and Candidiasis. Providence, Rhode Island, April.

Dahms, T. E. S.* (2018). Novel approaches for assessing the impact of xenobiotics on live cells. Elia, LAAS-CNRS, France.

Dahms, T. E. S.* (2018). Novel approaches to assess the impact of xenobiotics on live microbes. Department of Physics, University of Regina, Regina, SK.

Interruptions

During the pandemic (2020/3 - 2022/3), I had substantial familial responsibilities as primary caregiver for my 4 year old over an 18 month period. This left only 3 h/day for teaching and research, working evenings and weekends. The transition to on-line classes consumed more than 2 months research time and online teaching came with an increased volume of course email.
All Dahms lab personnel (3 PhD, 3 summer research students) had serious setbacks from lab closures (3 months) or limited access (one student/room for 8 months). Complete closure (11 months) of the Institute of Environmental Change and Society, which houses our microscope fleet, eliminated our ability to further develop and apply our correlative microscopy assays, requiring two PhD students to alter their research plans and having associated delays.
All three PhD student trainees lost 1 to 4 family members during the pandemic, requiring significant time for grieving. While Shahina finished her PhD degree in a reasonable timeframe, her publications were significantly delayed, severely impacting her ability to secure a postdoctoral position until this fall. All tolled, I lost 12 months of research and have therefore included 2018 research output in this CV.

I was on maternity leave (2016/2 - 2017/3) as primary care giver, as was my PhD student Bhat, delaying a number of our publications and limiting travel to and presentation at conferences. During this time, I lost 12 months of research.

Funding Pending

2024/4 - 2029/3 - Principal and Sole Applicant
Linking cell wall integrity, stress and mechanosensing to candidal growth and development by correlative microscopy, Grant
Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant
Total Funding (competitive) - 396,000

Funding Current

2018/4 - 2024/3 - Principal and Sole Applicant
Discovering the networks that control cell wall integrity, cell division, morphogenesis and adhesion in Candida albicans using high content microscopy assays, Grant
Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant
Total Funding (competitive) - 252,000

2023/4 - 2024/3 - Principal Applicant
University of Regina Cellular Impacts Facility Microscopes and Cell Culture, Grant
NSERC Research Tools and Instruments (equipment)
Total Funding (competitive) - 150,000
Co-applicants: Drs. Josef Buttigieg; Nicole Hansmeier; Tzu-Chiao Chao

Funding Past
2019/3 - 2021/2 - Principal Applicant
A novel class of antifungals for preventing fungal infections, Grant
Saskatchewan Health Research Foundation (SHRF), Collaborative Innovation Development Grant
Total Funding (competitive) - 50,000
Co-applicant: Dr. Taranum Sultana

2014/11 - 2018/10 - Principal and Sole Applicant
Reducing pesticide use on campus: plant health care model for campus greens, Grant
University of Regina, Sustainability and Community Engagement Fund
Total Funding (competitive) - 10,000
Co-investigators: Drs. Chris Yost, Scott Wilson, Ms. Heather Haynes, Miller high school;
Co-knowledge User: Carol Reyda, Facilities Management;
Decision Maker: Mike Mamona, Director Wascana Center Authority