

# James S. Santangelo

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code/data: [github.com/James-S-Santangelo](https://github.com/James-S-Santangelo)

## EDUCATION & APPOINTMENTS

<b>Postdoc</b>	<i>University of California Berkeley</i> Department of Integrative Biology Advisor: <a href="#">Rasmus Nielsen</a>	January 2023
<b>PhD</b>	<i>University of Toronto</i> Department of Ecology and Evolutionary Biology Advisors: <a href="#">Marc T. J. Johnson</a> and <a href="#">Rob W. Ness</a> Thesis: Evolutionary processes in urban environments	July 2022
<b>HBSc</b>	<i>University of Toronto Mississauga</i> Department of Biology	June 2015

## PUBLICATIONS

(First-authored = 11; [Google Scholar](#))

### Published and Accepted Manuscripts <sup>†</sup>Student mentee authors

17. Keerath Bhachu, Hind Emad Fadoul, **James S. Santangelo**, Marc T. J. Johnson. (2024). Tissue-specific expression of HCN and its metabolic precursors in *Trifolium repens*. *Botany*. *In Press*.
16. Aude E. Caizergues, **James S. Santangelo**, Rob W. Ness, Fabio Angeoletto, Daniel Anstett, Julia Anstett, Fernanda Baena-Diaz, Elizabeth J. Carlen, Jaime A. Chaves, Mattheau S. Comerford, Karen Dyson, Mohsen Falahati-Anbaran, Mark D.E. Fellowes, Kathryn A. Hodgins, Glen R. Hood, Carlos Iñiguez-Armijos, Nicholas J. Kooyers, Adrián Lázaro-Lobo, Angela T. Moles, Jason Munshi-South, Juraj Paule, Ilga M. Porth, Luis Y. Santiago-Rosario, Kaitlin Stack Whitney, Ayko J.M. Tack, Marc T.J. Johnson. (2023). Does urbanization lead to parallel demographic shifts across the world in a cosmopolitan plant? *Molecular Ecology* 33: e17311. [PDF](#)
15. **Santangelo J. S.**, Paul Battlay, Brandon T. Hendrickson, Wen-Hsi Kuo, Kenneth M. Olsen, Nicholas J. Kooyers, Marc T.J. Johnson, Kathryn A. Hodgins, Rob. W. Ness. (2023). Haplotype-resolved, chromosome-level assembly of white clover (*Trifolium repens* L., Fabaceae). *Genome Biology and Evolution* 15: evad146. [PDF](#) [GitHub](#).
14. **Santangelo, J. S.**, <sup>†</sup>Roux, C., Johnson, M. T. J. (2022). The effects of environmental heterogeneity within a city on the evolution of clines. *Journal of Ecology* 100: 2950-2959. [PDF](#) [GitHub](#)
13. Verrelli, Brian C., Alberti, M., Des Roches, S., Harris, N. C., Hendry, A. P., Johnson, M. T. J., Savage, A. M., Chanrmanier, A., Gotanda, K. M., Govaert, L., Miles, L. S., Rivkin, L., R., Winchell, K. M., Brans, K. I., Correa, C., Diamond, S. E., Fitzhugh, B., Grimm, N. B., Hughes, S., Marzluff, J. M., Munshi-South, J., Rojas, C., **Santangelo, J. S.**, Schell, C., J., Schweitzer, J. A., Szulkin, M. C., Zhou, Y., and Ziter, C. (2022). A global horizon scan for urban evolutionary ecology. *Trends in Ecology & Evolution* 37: 1006-1019. [PDF](#)

12. Innes, S. G., **Santangelo J. S.**, Kooyers, N. J., Olsen, K. M., Johnson, M. T. J. (2022). Evolution in response to climate in the native and introduced ranges of a globally distributed plant. Evolution 76: 1495-1511. [PDF](#)
11. **Santangelo J. S.**, Rob W. Ness, Marc T. J. Johnson, and The Global Urban Evolution Project (GLUE). (2022). Global urban environmental change drives adaptation in white clover. Science 375: 1275-1281. [PDF](#) [GitHub](#) [Learn more about GLUE](#)
10. **Santangelo J. S.**, L. Ruth Rivkin, <sup>†</sup>Advenard, C., Thompson, K. A. (2020). Multivariate phenotypic divergence along an urbanization gradient. Biology Letters 16: 20200511. [PDF](#) [GitHub](#)
9. **Santangelo J. S.**, Thompson, K. A., <sup>†</sup>Cohan, B., <sup>†</sup>Syed, J., Ness, R. W., and Johnson, M. T. J. (2020). Predicting the strength of urban-rural clines in a Mendelian polymorphism along a latitudinal gradient. Evolution Letters 4: 212-225. [PDF](#) [GitHub](#)
8. Johnston L., Bonsma-Fisher M., Ostblom J., Hasan A., **Santangelo J. S.**, Tran L., Sales de Andrade E., Coome L., and Mahallati S. (2019). A graduate student-led participatory live-coding quantitative methods course in R: Experiences on initiating, developing, and teaching. Journal of Open Source Education 2: 6-11. [PDF](#) [GitHub](#)
7. L. Ruth Rivkin, **Santangelo J. S.**, Alberti M., Aronson M. F. J., de Keyzer C. W., Diamond S. E., Fortin M.-J., Frazee L. J., Gorton A. J., Hendry A. P., Liu Y., Losos J. B., MacIvor J. S., Martin R. A., McDonnell M. J., Miles L. S., Munshi-South J., Ness R. W., Newman A. E. M., Stothart M. R., Theodorou P., Thompson K. A., Verrelli B. C., Whitehead A., Winchell K. M., and Johnson M. T. J. (2019). A roadmap for urban evolutionary ecology. Evolutionary Applications 12: 384-398. [PDF](#)
6. **Santangelo J. S.**, Thompson K. A., and Johnson M. T. J. (2019). Herbivores and plant defenses affect selection on plant reproductive traits more strongly than pollinators. Journal of Evolutionary Biology 32: 4-18. [PDF](#) [GitHub](#)  
\*\*\**This manuscript won ESEB's Stephen Stearns Prize*
5. **Santangelo J. S.**, L. Ruth Rikvin, and Johnson M. T. J (2018). The evolution of city life. Proceeding of the Royal Society B: Biological Sciences 285: 20181529. [PDF](#)
4. **Santangelo J. S.**, Johnson M. T. J., and Ness R. W. (2018). Modern spandrels: the roles of genetic drift, gene flow and selection in the evolution of parallel clines. Proceeding of the Royal Society B: Biological Sciences 285: 20180230. [PDF](#) [GitHub](#)
3. Cadotte M. W., Livingstone S. W. Yasui S.-L. E., Dinnage R. Li, J.-T., Marushia R. **Santangelo J. S.**, and Shu W. (2017). Explaining ecosystem multifunction with evolutionary models. Ecology 98: 3175-3187. [PDF](#)
2. **Santangelo J. S.**, and Kotanen P. M. K. (2016). Non-systemic fungal endophytes increase survival but reduce tolerance to simulated herbivory in subarctic *Festuca rubra*. Ecosphere 7: e01260. [PDF](#)
1. **Santangelo J. S.**, Turley N. E., and Johnson M. T. J. (2015). Fungal endophytes of *Festuca rubra* increase in frequency following long-term exclusion of rabbits. Botany 93(4): 233-241. [PDF](#)

## Book chapters

1. **Santangelo J. S.**, Miles L. M., Breitbart S. T., Murray-Stoker D., L. Ruth Rivkin, Johnson M. T. J., and Ness R. W. (2020). Urban environments as a framework to study parallel evolution. In: *Urban Evolutionary Biology*, pp. 36-53. M. Szulkin, J. Munshi-South, and A. Charmantier, Eds. Oxford University Press, Oxford, UK. [PDF](#)

## Submitted Manuscripts and pre-prints

3. Jill T. Anderson, Megan L. DeMarche, Derek A. Denney, Ian Breckheimer, **James S. Santangelo**, Susana M. Wadgymar. (2024). Adaptation and gene flow are insufficient for persistence of an alpine plant under climate change. *Science*. *In Revision*.
2. Paul Battlay, Brandon T. Hendrickson, Jonas I. Mendez-Reneau, **James S. Santangelo**, Lucas Albano, Jonathan Wilson, Aude E. Caizergues, Nevada King, Adriana Puentes, Amelia Tudoran, Cyrille Violle, Francois Vasseur, Courtney M. Patterson, Michael Foster, Caitlyn Stamps, Simon G. Innes, Remi Allio, Fabio Angeoletto, Daniel N. Anstett, Julia Anstett, Anna Bucharova, Mattheay S. Comerford, Satiago Daivd, Mohsen Falahati-Anbaran, William Godsoe, César González-Lagos, Pedro E. Gundel, Glen R. Hood, Regina Karousou, Christian Lampei, Carlos Lara, Adrián Lázaro-Lobo, Deleon Leandro, Thomas J.S. Merritt, Nora Mitchell, Mitra Mohammadi Bazarganim, Angela Moles, Maureen Murúa, Juraj Paule, Vera Pfeiffer, Joost A. M. Raeymaekers, Diana Rennison, Rodrigo S. Rios, Jennifer K. Rownstree, Adam C. Schneider, Kaitlin Stack Whitchey, Ítalo Tamburrino, Acer VanWallendael, Paul Y. Kim, Rob W. Ness, Marc T. J. Johnson, Kathryn A. Hodgins, Nicholas J. Kooyers. (2024). Structural variants underlie parallel adaptation following global invasion. *PNAS*, *Submitted*. [bioRxiv](#)
1. David Murray-Stoker, **James S. Santangelo**, Marta Szulkin, Marc T. J. Johnson. (2024). Comparing approaches to quantify urbanization on a multicontinental scale. [bioRxiv](#)

## Educational resources (not peer reviewed)

1. **Santangelo J. S.** (2019). Data simulation and randomization tests. *NEON Faculty Mentoring Network*, *QUBES Educational Resources*. [Access](#).

## **FUNDING & FELLOWSHIPS**

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(Total Funding = ≈\$816,900 CAD; ≈\$606,300 USD)

<b>Miller Postdoctoral Fellowship</b> , Miller Institute, UC Berkeley (\$255,000 USD)	2023
<b>Long-term Fellowship (LTF)</b> , Human Frontiers Science Program (HFSP, \$202,956 USD) — <i>Declined</i>	2023
<b>Postdoctoral Fellowship (PDF)</b> , National Engineering and Research Council of Canada (NSERC, \$90,000) — <i>Declined after 6 months</i>	2022
<b>Canada Graduate Scholarship-Doctoral (CGS-D)</b> , National Engineering and Research Council of Canada (NSERC, \$35,000)	2020
<b>Postgraduate Scholarship-Doctoral (PGS-D)</b> , National Engineering and Research Council of Canada (NSERC, \$42,000)	2018
<b>Ontario Graduate Scholarship (OGS)</b> , Government of Ontario, Canada (\$15,000)	2017
<b>Canada Graduate Scholarship-Masters (CGS-M)</b> , National Engineering and Research Council of Canada (NSERC, \$17,500)	2016

## **PRIZES, HONORS & AWARDS**

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(Total Awards = ≈\$18,000 CAD; ≈\$13,400 USD)

<b>Hottest Paper Award</b> , University of Toronto Mississauga Biology Department	2023
<b>Governor General's Gold Medal</b> , University of Toronto	2023
<b>Hamilton Award Finalist</b> , Society for the Study of Evolution (\$624)	2022
<b>Doctoral Excellence Award</b> , Canadian Society for Ecology and Evolution (\$600)	2022

<b>Peter Abrams Award</b> , University of Toronto Ecology and Evolutionary Biology Department (\$500)	2022
<b>Roberta Bondar Graduate Student Excellence Award</b> , University of Toronto Mississauga Department of Biology (\$2452)	2021
<b>Doctoral excellence scholarship</b> , University of Toronto Faculty of Arts and Science (\$5000)	2020
<b>Rustom H. Dastur Graduate Scholarship</b> , University of Toronto Ecology and Evolutionary Biology Department (\$2602)	2020
<b>R. Ramsay Wright Graduate Scholarship</b> , University of Toronto Ecology and Evolutionary Biology Department (\$1000)	2020
<b>Robert L. Jefferies Graduate Scholarship</b> , University of Toronto Ecology and Evolutionary Biology Department (\$396)	2020
<b>Stephen Stearns Graduate Student Prize</b> , European Society for Evolutionary Biology (\$375)	2019
<b>Frederick P. Ide Graduate Award</b> , University of Toronto Ecology and Evolutionary Biology Department (\$3000)	2019
<b>ASN 1<sup>st</sup> place presentation</b> , Ontario Ecology, Ethology, and Evolution colloquium (OE3C), Kingston, Canada (\$125)	2017
<b>CSPB best talk in botany</b> , Ontario Biology Day (OBD), Ottawa, Canada (\$100)	2015
<b>New Phytologist Prize for best presentation in botany</b> , Canadian Society for Ecology and Evolution (CSEE), Saskatoon, Canada (\$100)	2015
<b>Award for research excellence in evolution</b> , Ontario Biology Day (OBD), Mississauga, Canada	2014
<b>Undergraduate research grant</b> , University of Toronto Mississauga (\$500)	2014
<b>Alan F. Coventry Memorial Scholarship</b> , University of Toronto Mississauga Biology Department (\$782)	2013

## INVITED TALKS

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UC Berkeley	Cal Genomics Summer Research Experience	2024
University of Ottawa	Departmental seminar	2024
Dovetail Genomics	Genomes of Animals and Plants	2023
University of Michigan	Early Career Scientists Symposium	2023
University of Montréal	Departmental seminar	2023
University of Louisiana Lafayette	Departmental seminar	2022
NSF RCN on Urban Eco-Evo	Virtual seminar series	2022
University of Toronto Mississauga	Departmental seminar	2021
Radcliffe Institute, Harvard University	Next in Evolution	2018
University of Toronto Mississauga	19 <sup>th</sup> annual New Phytologist Workshop	2017

## CONTRIBUTED PRESENTATIONS

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(# Contributed Talks/Posters = 16; # Talk/Poster Awards = 6)

(\*Poster presentation; †Award)

SSE-ESEB, Montreal, Canada	2024
CSEE, Winnipeg, Canada	2023
ESEB, Prague, Czech Republic	2022
†CSEE, Montréal, Canada	2022
Evolution meeting, Cleveland, Ohio	2022
VIII Congreso Mexicano de Ecología, Oaxaca, Mexico	2022
Atwood Colloquium, University of Toronto, Toronto	2022

†ESEB, Turku, Finland	2019
Evolution meeting, Providence, Rhode Island	2019
*Evolution joint congress, Montpellier, France	2018
Evolution meeting, Portland, Oregon	2017
†Ontario Ecology, Ethology, and Evolution Colloquium (OE3C), Kingston, Canada	2017
†Ontario Biology Day (OBD), Ottawa, Canada	2015
†Canadian Society for Ecology and Evolution (CSEE), Saskatoon, Canada	2015
†Ontario Biology Day (OBD), Mississauga, Canada	2014
*Canadian Society of Plant Biologists (CSPB), Mississauga, Canada	2013

## SERVICE, LEADERSHIP, & PROFESSIONAL EXPERIENCE

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<b>Reviewer</b> , CSEE Doctoral Excellence Awards	2024
<b>Reviewer</b> , SSE Rosemary Grant Advanced Awards	2023
<b>Grad student rep</b> , UTM Systems Biology Faculty Search	2019 - 2020
<b>Editor</b> , UofT EEB Quarterly Review magazine	2018 - 2020
<b>Co-organizer/instructor</b> , UTM Bi-weekly Graduate Student Programming Workshops	2018 - 2019
<b>Member</b> , UTM Biology Executive Committee	2017 - 2019
<b>Member</b> , UTM Biology Seminar Committee	2017 - 2019
<b>Member</b> , Tri-campus Graduate Chair Search Committee	2018
<b>Member</b> , Ecology and Evolutionary Biology Chair Search Committee	2018
<b>UTM campus representative</b> , EEB Graduate Student Association	2018
<b>Guest Editor</b> , <i>Proceedings B</i> Special Issue: "The Evolution of City Life"	2017 - 2018
<b>Organizer</b> , 19 <sup>th</sup> annual New Phytologist Workshop: "Synthesis in the City: Urban Evolutionary Ecology"	2017
<b>Co-president</b> , UTM Biology Graduate Student Society	2017
<b>Treasurer</b> , UTM Biology Graduate Student Society	2016
<b>Member</b> , UTM Biology Chair Search Committee	2018

## TEACHING EXPERIENCE

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### Course instructor & developer

EEB313: Quantitative methods in R for biology	2018 - 2019
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### Administrative teach assistant

BIO259: Introduction to biological data	2022
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### Teaching assistant

BIO259: Introduction to biological data	2022
BIO152: Introduction to evolution and genetics	2020
BIO342: Evolutionary biology	2017 - 2022
BIO205: Ecology	2017

### Guest lectures

HSC302: Biocommunication visualization	2018 - 2020
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## MENTORSHIP & ADVISING

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(<sup>†</sup>Co-author on published manuscript)

<sup>†</sup> <b>Cindy Roux</b> , Visiting graduate student from France	Summer 2019
<b>Trevor Schmahl</b> , Undergraduate thesis student	Sept. 2018 - April 2019
<sup>†</sup> <b>Beata Cohan</b> , Undergraduate thesis student	Sept. 2017 - Dec. 2018
<sup>†</sup> <b>Carole Advenard</b> , Visiting graduate student from France	Summer 2017
<sup>†</sup> <b>Jibran Syed</b> , Undergraduate thesis student	Sept. 2016 - April 2017

## REVIEWER

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Annals of Botany, Ecology, Ecology and Evolution, Evolution, Evolutionary Applications, Frontiers Ecology and Evolution, Journal of Evolutionary Biology, Journal of Urban Evolution, Nature Cities, Nature Ecology & Evolution, New Phytologist, Plant Cell & Environment, Proceedings of the Royal Society B, Science, Scientific Reports

## SOCIETY MEMBERSHIPS

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Society for Molecular Biology and Evolution (SMBE)	2024 - present
European Society for Evolutionary Biology (ESEB)	2022 - present
Society for the Study of Evolution (SSE)	2017 - present
Canadian Society of Ecology and Evolution (CSEE)	2015 - present