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Education

University of Wisconsin-Madison

Madison, WI

Doctor of Philosophy (PhD) - Genetics

04/2019

Master of Science (MSc) - Genetics

10/2017

- Advisor: Cameron R Currie, PhD
- Research Focus: Evolution of Microbial Metabolic Diversity, Chemically-mediated Microbiome Interactions, & Antibiotic Discovery
- Thesis: Evolution of Antibiotic Biosynthesis in Actinobacteria: A Framework for Drug Discovery

Institut Pasteur Annecy, France

Certificate - International Course on Antibiotics and Resistance

11/2017

Harvard University Extension

Cambridge, MA

Master of Liberal Arts (ALM) - Biotechnology (Bioengineering & Nanotechnology)

03/2015

- Advisor: Tomás Maira-Litrán, PharmD, PhD
- Research Focus: Genome-wide Experimental & Computational Characterization of In Vivo Fitness Factors in Bacterial Infections
- Thesis: Transposon-Directed Insertion Site Sequencing for Determination of Fitness Factors in Pulmonary Infection by A. baumannii.

Rensselaer Polytechnic Institute

Troy, NY

Bachelor of Science (BSc) - Molecular Biology & Bioinformatics

12/2010

📳 Experience 📖

Wisconsin Institute for Discovery & University of Wisconsin-Madison

Madison, WI

Postdoctoral Associate - Department of Plant Pathology - Advisor: Jo Handelsman, PhD

06/2019-present

WiSolve Consulting Madison, WI Co-Founder & Senior Consultant 03/2016-present 01/2018-09/2019 Director of Technology

University of Wisconsin-Madison

Madison, WI

Postdoctoral Associate - Department of Bacteriology - Advisor: Cameron R Currie, PhD 04/2019-05/2019 PhD Candidate - Department of Genetics - Advisor: Cameron R Currie, PhD 08/2015-04/2019

Harvard & Georgetown Universities

Cambridge, MA

Lead Computational Biologist - Departments of Biology and Planetary Science - Advisor: Sarah S Johnson, PhD

10/2013-10/2015

Warp Drive Bio Cambridge, MA Head of Experimental Genomics 04/2013-08/2015

Brigham & Women's Hospital

Research Assistant, Microbiology & Computational Biology - Advisor: Tomás Maira-Litrán, PharmD, PhD

Boston, MA 03/2013-08/2015

Broad Institute of MIT & Harvard

Cambridge, MA

Research Associate II, Molecular Biology Process Development

01/2011-03/2013

Rensselaer Polytechnic Institute

Troy, NY

Research Associate, Molecular Genetics - Advisor: Eric Rutledge, PhD

05/2010-12/2010 Jamestown, RI

09/2009-12/2009

Research Assistant, Microbiology

$m{ ilde{\blacksquare}}$ Publications, Talks, & Abstracts $_$

Peer-reviewed Publications

*contributed equally

2019

BCR Biotech

EJ Caldera*, MG Chevrette*, BR McDonald, CR Currie. "Local adaptation of bacterial symbionts within a geographic mosaic of antibiotic coevolution." Applied & Environmental Microbiology, In press.

2019

MG Chevrette, C Carlos-Shanley, KB Louie, BP Bowen, TR Northen, CR Currie. "Taxonomic and metabolic incongruence in the ancient genus Streptomyces." Frontiers in Microbiology. 10.3389/fmicb.2019.02170

- K Throckmorton*, V Vinnik*, R Chowdhury, TB Cook, **MG Chevrette**, CD Maranas, BF Pfleger, MG Thomas. "Directed evolution of an adenylation domain specificity code." **ACS Chemical Biology**. **10.1021/acschembio.9b00532**
- J Yan, **MG Chevrette**, D Braun, MK Harper, CR Currie, TS Bugni. "Madurastatin D1 and D2, oxazoline containing siderophores isolated from an *Actinomadura* sp." *Organic Letters*. 10.1021/acs.orglett.9b02159
- MG Chevrette*, JR Bratburd*, CR Currie, RM Stubbendieck. "Experimental microbiomes: models not to scale." *mSystems*. 10.1128/mSystems.00175-19
 - MG Chevrette, CM Carlson, HE Ortega, C Thomas, GE Ananiev, KJ Barns, AJ Book, J Cagnazzo, C Carlos, W Flanigan, KJ Grubbs, HA Horn, FM Hoffmann, JL Klassen, JJ Knack, GR Lewin, BR McDonald, L Muller, WGP Melo, AA Pinto-Tomás, A
- Schmitz, E Wendt-Pienkowski, S Wildman, M Zhao, F Zhang, TS Bugni, DR Andes, MT Pupo, CR Currie. "The antimicrobial potential of *Streptomyces* from insect microbiomes." *Nature Communications*. 10.1038/s41467-019-08438-0 [Highlighted by NPR]
- RM Stubbendieck, DS May, **MG Chevrette**, MI Temkin, E Wendt-Pienkowski, J Cagnazzo, CM Carlson, JE Gern, CR Currie.

 "Competition among nasal bacteria suggests a role for siderophore-mediated interactions in shaping the human nasal microbiota." *Applied & Environmental Microbiology*. 10.1128/AEM.02406-18
- N Liu,* H Li,* **MG Chevrette**, L Zhang, L Cao, H Zhou, X Zhou, PB Pope, CR Currie, Y Huang, Q Wang. "Functional metagenomics reveals polysaccharide-degrading gene clusters and cellobiose utilization pathways in gut microbiota of a wood-feeding termite." *ISME Journal*. 10.1038/s41396-018-0255-1
- MG Chevrette, CR Currie. "Emerging evolutionary paradigms in antibiotic discovery." Journal of Industrial Microbiology & Biotechnology. 10.1007/s10295-018-2085-6
 - N Adnani, **MG Chevrette**, SN Adibhatla, F Zhang, Q Yu, D Braun, J Nelson, SW Simpkins, BR McDonald, CL Myers, J Piotrowski, C Thompson, CR Currie, L Li, SR Rajski, TS Bugni. "Co-culture of marine invertebrate-associated bacteria and interdisciplinary technologies enable biosynthesis and discovery of a new antibiotic, keyicin." **ACS Chemical Biology**. **10.1021/acschembio.7b00688**
 - [Highlighted by Nature]
- AF Sanchez-Larrayoz, NM Elshamy, **MG Chevrette**, Y Fu, P Giunta, RG Spallanzani, K Ravi, GB Pier, S Lory, T Maira-Litrán.

 "Complexity of complement-resistance factors expressed by *Acinetobacter baumannii* needed for survival in human serum." *Journal of Immunology*. 10.4049/jimmunol.1700877
- MG Chevrette, F Aicheler, O Kohlbacher, CR Currie, MH Medema. "SANDPUMA: Ensemble predictions of nonribosomal peptide chemistry reveals biosynthetic diversity across Actinobacteria." *Bioinformatics*. 10.1093/bioinformatics/btx400
- IJ Miller, MG Chevrette, JC Kwan. (2017). "Interpreting microbial biosynthesis in the genomic age: Biological and practical considerations." *Marine Drugs.* 10.3390/md15060165

 [Cover Image for Issue 6, Volume 15 in June 2017]
- K Blin, T Wolf, **MG Chevrette**, X Lu, CJ Schwalen, SA Kautsar, HG Suarez Duran, ELC de los Santos, HUK Kim, M Nave, JS

 Dickschat, DA Mitchell, E Shelest, R Breitling, E Takano, SY Lee, T Weber, MH Medema. "antiSMASH 4.0 Improvements in chemistry prediction and gene cluster boundary identification." *Nucleic Acids Research*. 10.1093/nar/gkx319
- GR Lewin, C Carlos, **MG Chevrette**, HA Horn, BR McDonald, RJ Stankey, BG Fox, CR Currie. "Ecology and evolution of Actinobacteria and their bioenergy applications." *Annual Review of Microbiology*. **10.1146/annurev-micro-102215-095748**
- SS Johnson, **MG Chevrette**, BL Ehlmann, KC Benison. "Insights from the metagenome of an acid salt lake: The role of biology in an extreme depositional environment." **PLOS ONE. 10.1371/journal.pone.0122869**

Book Chapters

2017

MG Chevrette, PA Hoskisson, F Barona-Gómez. "Enzyme evolution in secondary metabolism." Comprehensive Natural Products III: Chemistry and Biology. In press.

Preprints, Submitted, and Under Review

BR McDonald, **MG Chevrette**, JL Klassen, HA Horn, EJ Caldera, E Wendt-Pienkowski, MJ Cafaro, AC Ruzzini, EB Van Arnam, GM Weinstock, NM Gerardo, M Poulsen, G Suen, J Clardy, CR Currie. "Biogeography and microscale diversity shape the biosynthetic potential of fungus-growing ant-associated *Pseudonocardia*." *Preprint available*

Invited Talks

- "Drugs from bugs of bugs: a novel source for antimicrobials." American Society for Microbiology Microbe. San Francisco, CA.
 Jun 21, 2019.
- "Mining microbiomes for antimicrobials." Synthetic Biology for Natural Products Conference. Puerto Vallarta, Mexico. Jun 02, 2019.
- "Host-associated microbes as a source of new antimicrobials." Natural Product Discovery & Development in the Genomic Era, Society for Industrial Microbiology & Biotechnology. Clearwater Beach, FL. Jan 22, 2018.

- "Natural natural products: Leveraging chemical ecology in the search for new drugs." Evolution Seminar Series, JF Crow Institute for the Study of Evolution. Madison, WI. Oct 26, 2017.
- "Computational insights into the diverse nonribosomal peptide chemistry of Actinobacteria." Synthetic Biology for Natural Products Conference. Cancun, Mexico. Mar 6, 2017.

[Highlighted in ACS Synthetic Biology]

"Darwinian drug discovery: Chemical ecology at fine and coarse evolutionary scales." International Chemical Biology Society
Annual Conference. Madison, WI. Oct 24, 2016.

[Highlighted in ACS Chemical Biology]

Patents

DC Gray, E Li, BR Bowman, GL Verdine, K Robison, **MG Chevrette**, D Udwary, PS Wang, A Li, JP Morgenstern. Compositions and methods for the production of compounds. Patent Application PCT/US2017/058800, filed Oct 27, 2017. Publication Number **WO/2018/081590**

Publications, Editorial Review Only

- MG Chevrette. "Natural products reawakened: New trends in discovery and development." SIMB News Magazine, Society for Industrial Microbiology and Biotechnology.
- DR Braun, **MG Chevrette**, D Acharya, CR Currie, SR Rajski, TS Bugni. "Draft genome of *Micromonospora sp. WMMA1996*, a marine sponge-associated bacterium." *Genome Announcements*. **10.1128/genomeA.00077-18**
- DR Braun, **MG Chevrette**, D Acharya, CR Currie, SR Rajski, K Ritchie, TS Bugni. "Complete genome of *Dietzia sp. WMMA184*, a marine coral-associated bacterium." *Genome Announcements*. 10.1128/genomeA.01582-17
- N Adnani, DR Braun, BR McDonald, **MG Chevrette**, CR Currie, TS Bugni. "Draft genome of *Micromonospora sp. WMMB-235*, a marine ascidian-associated bacterium." *Genome Announcements*. 10.1128/genomeA.01369-16
- N Adnani, DR Braun, BR McDonald, **MG Chevrette**, CR Currie, TS Bugni. "Complete genome sequence of *Rhodococcus sp. strain WMMA185*, a marine sponge-associated bacterium." *Genome Announcements*. 10.1128/genomeA.01406-16

Internal Seminars

- 2018 "Drugs & bugs of bugs: Insect microbiomes as a source of new antibiotics." Genetics Colloquium, UW-Madison. Aug 8, 2018.
- "Host-microbe interactions as as a source of new antimicrobials ." Highlights at the Chemistry-Biology Interface Colloquium, UW-Madison. Dec 12, 2017.
- "Genome-based natural product discovery, modular biosynthesis, & applications." Highlights at the Chemistry-Biology Interface Colloquium, UW-Madison. Feb 2, 2017.
- 2016 "Genome assembly: Tools & analysis." Computational Biology, Ecology, & Evolution (ComBEE), UW-Madison. Apr 27, 2016.

Abstracts

- 2019 MG Chevrette, D Acharya, A Hurley, M Beebe, M Garavito, S Miller, J Handelsman. "Tiny Earth Chemistry Hub: From soil to antibiotics." Presented at: Tiny Earth Symposium; Madison, WI; Jul 10, 2019.
- K Throckmorton, V Vinnik, TB Cook, R Chowdhury, MG Chevrette, CD Maranas, BF Pfleger, MG Thomas. "Directed
 evolution of an adenylation domain specificity code." Presented at: Synthetic Biology for Natural Products Conference;
 Puerto Vallarta, Mexico; Jun 2, 2019.
- <u>CL Hansen</u>, MG Chevrette, M Selvaraj, A Vasquez Echeverri, D Maldonado Perez, C Eno, J Hernandez-Ortiz, F Pelegri.
 "Helical supramolecular assembly of a germline specific membraneless organelle." Presented at: Phase Separation in Biology & Disease; New York, NY; Feb 20, 2019.
- MG Chevrette, CM Carlson, H Ortega, F Zhang, KJ Grubbs, MT Pupo, TS Bugni, DR Andes, CR Currie. "Insect-associated Streptomyces are a rich source of new antimicrobials." Presented at: Beneficial Microbes; Madison, WI; Jul 9, 2018.
- 2018 HA Horn, E Gemperline, K Delaney, **MG Chevrette**, L Li, CR Currie. "Host specificity influences chemical resopnse in *in vivo* symbiotic interactions." Presented at: Beneficial Microbes; Madison, WI; Jul 9, 2018.
- BR McDonald, MG Chevrette, J Klassen, HA Horn, EJ Caldera, E Wendt-Pienkowski, MJ Cafaro, AC Ruzzini, EB Van Arnam,

 GM Weinstock, NM Gerardo, MG Poulsen, G Suen, J Clardy, CR Currie. "Biogeography and microscale diversity shapes the biosynthetic potential of fungus-growing ant associated *Pseudonocardia*." Presented at: Beneficial Microbes; Madison, WI; Jul 9, 2018.
- MG Chevrette, CM Carlson, H Ortega, F Zhang, KJ Grubbs, MT Pupo, TS Bugni, DR Andes, CR Currie. "Insect-associated Streptomyces are a rich source of new antimicrobials with activity against resistant human pathogens." Presented at: Perlman Antibiotic Discovery and Development Symposium; Madison, WI; Apr 27, 2018.
- DD Acharya, IJ Miller, Y Cui, DR Braun, MG Chevrette, M Berres, L Li, J Kwan, CR Currie, TS Bugni. "Chemical cross-talk in bacterial co-cultures affects differential gene expression and antibiotic production." Presented at: Perlman Antibiotic Discovery and Development Symposium; Madison, WI; Apr 27, 2018.

- R Zarnowski, **MG Chevrette**, E Dominguez, DR Andes. "Modeling high-throughput proteomics into predictive metabolomics

 A novel tool for studies of medical device-associated *Candida spp.* biofilm infections." Presented at: Metabolomics Circle
 2017 Bioanylytical & Omics Science, Wrocław, Poland; Nov 18, 2017.
- D Acharya, N Adnani, D Braun, IJ Miller, Q Yu, **MG Chevrette**, M Berres, CR Currie, L Li, JC Kwan, TS Bugni. "Chemical cross-talk in bacterial co-cultures affects differential gene expression and antibiotic production." Presented at: American Society for Pharmacognosy Annual Meeting, Portland, OR; Jul 30, 2017.
- AF Sanchez-Larrayoz, NM Elhosseiny, **MG Chevrette**, Y Fu, P Giunta, G Spallanzani, GB Pier, S Lory, <u>T Maira-Litrán</u>. "The membrane lipid asymmetry transport system plays a key role in protecting *Acinetobacter baumannii* against killing by human complement via the alternative pathway." Presented at: American Society for Microbiology Microbe, New Orleans, LA; Jun 2, 2017.
- MG Chevrette, CM Carlson, C Thomas, TS Bugni, DR Andes, CR Currie. "Evolutionary trends in secondary metabolism reveal insect-associated *Streptomyces* as an underexploited antibiotic resource." Presented at: Perlman Antibiotic Discovery and Development Symposium; Madison, WI; Mar 31, 2017.
- EJ Caldera, MG Chevrette, CR Currie. "The geographic mosaic of antibiotic coevolution in a bacterial symbiont of the fungus-farming ant *Apterostigma dentigerum*." Presented at: Perlman Antibiotic Discovery and Development Symposium; Madison, WI; Mar 31, 2017.
- J Bratburd, C Keller, E Vivas, MG Chevrette, F Rey, L Li, CR Currie. "The human gut microbiota metabolomic response to infection." Presented at: Perlman Antibiotic Discovery and Development Symposium; Madison, WI; Mar 31, 2017.
- MG Chevrette, CR Currie, MH Medema. "prediCAT: An accurate predictive method for substrate specificity of nonribosomal peptide synthetase adenylation domains." Presented at: Kenneth B. Raper Symposium on Microbial Research; Madison, WI; Sep 2, 2016.
- J Bratburd, BR McDonald, **MG Chevrette**, JL Klassen, HA Horn, CR Currie. "Comparative genomics of fungus-growing ant-associated *Pseudonocardia*." Presented at: Kenneth B. Raper Symposium on Microbial Research; Madison, WI; Sep 2, 2016.
- HA Horn, E Gemperline, **MG Chevrette**, BR Mcdonald, J Bratburd, E Mevers, J Clardy, L Li, CR Currie. "Mass spectrometry imaging reveals differential chemical response to pathogens in an ancient ant-microbe symbiosis." Presented at: ISME International Symposium on Microbial Ecology; Montreal, QC, Canada; Aug 21-26, 2016.
- MG Chevrette, CR Currie, MH Medema. "Computational predictions of substrate specificity in nonribosomal peptide synthetases through comparative adenylation domain trees." Presented at: American Society for Microbiology Microbe; Boston, MA; Jun 16-20, 2016.
- SS Johnson, ML Soni, DJ Collins, KC Benison, MR Mormile, MG Chevrette, BL Ehlmann. "Biosignatures in mars analog acid
 salt lakes." Presented at: USRA Biosignature, Preservation and Detection in Mars Analog Environments; Lake Tahoe,
 Nevada; May 16-19, 2016.
- 2016 MG Chevrette, C Carlson, C Thomas, TS Bugni, CR Currie. "Multifaceted antibiotic profiling across Actinomycete chemical ecology." Presented at: Perlman Antibiotic Discovery and Development Symposium; Madison, WI; Apr 29, 2016.
- N Adnani, S Adibhatla, E Vazquez-Rivera, GA Ellis, D Braun, **MG Chevrette**, BR McDonald, C Thompson, JS Piotrowski, Q Yu, L Li, CR Currie, TS Bugni. "Driving production of novel natural products through marine microbial interspecies interactions." Presented at: Gordon Marine Natural Products; Ventura, CA; Mar 6-11, 2016.
- MG Chevrette, DW Udwary, CR Currie, SS Johnson. "Functional classification and secondary metabolism of an extreme metagenome." Presented at: Kenneth B. Raper Symposium on Microbial Research; Madison, WI; Sep 1, 2015.
- MG Chevrette, BL Ehlmann, KC Benison, SS Johnson. "Microbial diversity and biosynthetic potential of an extreme sediment metagenome." Presented at: Gordon Applied and Environmental Microbiology; South Hadley, MA; Jul 12-17, 2015.
- 2015 MG Chevrette, M Vinacur, T Maira-Litrán. "Transposon-directed insertion site sequencing reveals *in vivo* fitness factors in *Acinetobacter baumannii* lung infections." Presented at: Boston Bacterial Meeting; Cambridge, MA; Jun 18-19, 2015.
- 2014 DW Udwary, K Robison, MG Chevrette, GL Verdine. "Lessons from long read assembly of 100+ Actinomycete genomes." Presented at: Gordon Marine Natural Products; Ventura, CA; Mar 2-7, 2014.
- 2014 K Robison, DW Udwary, **MG Chevrette**, GL Verdine. "Long read assembly of >100 Actinomycete genomes." Presented at: Advances in Genome Biology & Technology; Marco Island, FL; Feb 12-15, 2014.
- S Young, S Steelman, R Daza, MG Chevrette, R Lintner, S Gnerre, A Berlin, B Walker, C Nusbaum, R Nicol. "Generation of
 high-quality draft assemblies with a single sequencing library." Presented at: Sequencing, Finishing, Analysis in the Future;
 Santa Fe, NM; May 29-31, 2013.
- Steelman, R Daza, MG Chevrette, P Kompella, P Trang, T Surabian, R Lintner, CZ Zhang, J Jung, M Meyerson, C Nusbaum, R
 Nicol. "Automated low input mate-pair library construction for Illumina sequencing." Presented at: Advances in Genome Biology & Technology; Marco Island, FL; Feb 15-18, 2012.
- S Steelman, R Daza, <u>MG Chevrette</u>, P Kompella, P Trang, T Surabian, R Lintner, R Nicol. "Microbial mate-pair library construction for de novo detection of structural rearrangements." Presented at: Broad Institute Symposium; Boston, MA; Nov 7-8, 2011.

Honors & Awards _

Wisconsin Scientific Teaching Design Institute Fellow UW-Madison	2019-present
Schlimgen Award for Outstanding Scholarship in Doctoral Studies in Genetics UW-Madison	2019
Ira L Baldwin Distinguished Predoc. Fellowship for Excellence in Research Bacteriology, UW-Madison	2018-2019
Chemistry-Biology Interface Predoctoral Fellowship National Institutes of Health, NIGMS	2016-2018
Passed with Distinction Preliminary Examination A - Genetics, UW-Madison	07/2017
Issue Cover Marine Drugs: Connecting Marine Microbial Natural Products to Biosynthetic Pathways	06/2017
Bacteriology Departmental Travel Grant University of Wisconsin-Madison	2016
Vilas Travel Grant University of Wisconsin-Madison	2016
Dean's Academic Achievement Award Harvard University Extension	03/2015
Finalist, Core Value Award: "Courageous: Uncompromising Science" Warp Drive Bio	2014
Finalist, Core Value Award: "Unbounded: Reimagining the Possible" Warp Drive Bio	2014
Featured Scientific Researcher - "Who is Broad?" Broad Institute of MIT & Harvard	01/2012
Rensselaer Alumni Scholarship Rensselaer Polytechnic Institute	2004-2008
Sal H. Alfiero Scholarship Rensselaer Polytechnic Institute	2004-2008
Rhode Island State Scholarship Rensselaer Polytechnic Institute	2004-2008

Service & Outreach _____

Ad hoc Reviewer Critical Reviews in Microbiology, World Journal of Microbiology & Biotechnology, Microbial Genetics, Frontiers in Microbiology, FEMS Microbiology Letters, Microbial Cell Factories

Environmental, Health, and Safety Representative Broad Institute of MIT & Harvard

On-air Guest Perpetual Notion Machine, WORT FM, Link02/2019Evolution Coordinating Committee JF Crow Institute for the Study of Evolution, UW-Madison01/2017-presentMentor Google Summer of Code - antiSMASH, Open Bioinformatics Foundation03/2016-09/2017

Co-chair Computational Biology, Ecology, & Evolution (ComBEE), UW-Madison01/2016-08/2018Co-organizer Discovery Niche, Wisconsin Institutes for Discovery10/2015-11/2015

Volunteer Wisconsin Science Festival10/2015Open Genomics Adviser Revive & Restore, Long Now Foundation04/2014-10/2015

Teaching Experience

Wisconsin Scientific Teaching Design Institute Fellow Course Development	2019-present
Tiny Earth: Genomics & Chemistry of Soil Bacteria, UW-Madison Lead Lecturer, Course Development	Su 2019
Microbiology 450: Diversity, Ecology, & Evolution of Microorganisms, UW-Madison Lecturer	Fa 2018
Programming in R, ComBEE, UW-Madison Lead Lecturer, Course Development	Sp 2016
Genetics 468: General Genetics II, UW-Madison Lecturer, TA	Sp 2016
Microbiology 450: Diversity, Ecology, & Evolution of Microorganisms, UW-Madison Lecturer, TA	Fa 2016

Professional Societies & Groups _____

International Chemical Biology Society	2016-present
Natural Products Discovery and Bioengineering Network	2016-present
American Society for Microbiology	2015-present
Computational Biology, Ecology, & Evolution (ComBEE) – UW-Madison	2015-present
JF Crow Institute for the Study of Evolution	2015-present
Society for Industrial Microbiology and Biotechnology	2014-present
Laboratory Robotics Interest Group - New England Chapter	2011-2015

01/2011-03/2013