

Marc G Chevrette

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🎓 Education & Training

University of Wisconsin-Madison

DOCTOR OF PHILOSOPHY (PHD) – GENETICS

Madison, WI

expected 04/2019

MASTER OF SCIENCE (MS) – GENETICS

10/2017

- **Advisor:** Cameron R Currie, PhD
- **Research Focus:** Evolution of Microbial Metabolic Diversity, Chemically-mediated Microbiome Interactions, & Antibiotic Discovery
- Ira L Baldwin Distinguished Predoctoral Fellow (2018-2019)
- NIH Chemistry-Biology Interface Predoctoral Fellow (2016-2018)

Institut Pasteur

Annecy, France

DIPLOMA – 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

WiSolve Consulting

Madison, WI

CO-FOUNDER, DIRECTOR OF TECHNOLOGY, SENIOR CONSULTANT

03/2016–present

- Provided business services (including market research analysis, business plan development, competitive landscape analysis, SBIR grant writing, and others) to early-stage companies in the biotech and pharmaceutical industries.

Currie Lab, University of Wisconsin-Madison

Madison, WI

PHD CANDIDATE

08/2015–present

- Built genomics-driven computational and analytic pipelines to uncover novel therapeutics and study the evolution of biosynthesis in free-living and host-associated microbes.
- Systems investigated include insects (leaf-cutting ants, honey bees, & insects broadly), marine invertebrates, soil communities, & the human microbiome.

Johnson Biosignatures Lab, Harvard & Georgetown Universities

Cambridge, MA

LEAD COMPUTATIONAL BIOLOGIST

10/2013–10/2015

- Performed whole genome sequencing and metagenomic analysis of environmental samples from sulfur-rich, extreme environments with implications in microbial ecology, biogeochemistry, and exobiology.
- Characterized biosynthetic potential of metagenomic data.

Warp Drive Bio

Cambridge, MA

HEAD OF EXPERIMENTAL GENOMICS

04/2013–08/2015

- Executed genomic-directed natural products drug discovery, high throughput Next Generation Sequencing (htNGS), computational biology, and molecular biology of actinomycetes and fungi.
- Designed and implemented genomic natural products searches over various scaffolds of business development and internal interest.
- Developed and curated computational pipelines and databases for assembly, annotation, and custom analysis of public and internal htNGS data (160,000 bacterial genomes, >150 closed and complete genomes) for analysis of novel polyketide, non-ribosomal peptide, and other natural product classes.
- Handled processing and management of sequence data, predictions, and analyses supporting multiple projects across discovery, molecular biology, engineering, and synthetic biology.
- Executed elucidation and prediction of novel chemical products of bacterial biosynthetic gene clusters and metabolic pathways (e.g. beta-lactams, aminoglycosides, rapamycin analogues, etc.).
- Developed internal pipelines for applied phylogenomic annotations and prioritizations of multiple data types to inform discovery and engineering efforts.
- Oversaw all lab and experimental support of actinomycete and fungal sequencing efforts for Illumina, Pacific Biosciences, and Oxford-Nanopore platforms.
- Bioinformatics software development to support molecular and synthetic biology efforts.
- Direct written and verbal communication of findings to senior leadership and business partners.
- Database management and delivery of sequence information to molecular biology, microbiology, and chemistry groups to aid drug discovery, strain engineering, and generation of expression constructs.

Maira-Litrán Infectious Disease Lab, Brigham & Women's Hospital

Boston, MA

RESEARCH ASSISTANT, MICROBIOLOGY & COMPUTATIONAL BIOLOGY

03/2013–08/2015

- Investigated *in vivo* fitness, horizontal gene transmission, and pathogenesis of *Acinetobacter baumannii*, *Staphylococcus aureus*, *Salmonella typhi*, and other virulent pathogens through microbiology, computational, and genomic techniques.
- Developed and optimized genetic tools to enable novel examinations of pathogen fitness, invasion, and virulence using high-throughput transposon-directed insertion site sequencing of infections in murine models.

Broad Institute of MIT & Harvard

Cambridge, MA

RESEARCH ASSOCIATE II, MOLECULAR BIOLOGY PROCESS DEVELOPMENT

01/2011–03/2013

- Independently designed development initiatives including supporting htNGS, microfluidics, and automation goals.
- Oversaw production and up-scaling of microbial mate-pair library construction (LC), integrated internal development with vendor technologies, and managed sample-tracking via real-time messaging to internal LIMS.
- Increased throughput of microbial LC Platform 4-fold by automation and protocol development.
- Worked extensively with mate-pair NGS LC, sequence analysis tools, genomic databases, statistical software, and programming/operating lab robotics.

Rutledge Molecular Genetics Lab, Rensselaer Polytechnic Institute

Troy, NY

RESEARCH ASSOCIATE, MOLECULAR GENETICS

05/2010–12/2010

- Designed and developed protocols and operating procedures for transgenic *Caenorhabditis elegans* cultures to model stress-induced neural degeneration and Parkinson's Disease.

BCR Biotech

Jamestown, RI

RESEARCH ASSISTANT, MICROBIOLOGY

09/2009–12/2009

- Wrote and optimized protocols and methods for engineering synthetic biosensing functions in *Bacillus* spores.

Publications, Talks, & Abstracts

PEER-REVIEWED PUBLICATIONS

*contributed equally

- P9 **MG Chevette**, CM Carlson, HE Ortega, C Thomas, GE Ananiev, KJ Barns, AJ Book, J Cagnazzo, C Carlos, W Flanigan, KJ Grubbs, HA Horn, FM Hoffman, 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, J Clardy, TS Bugni, DR Andes, MT Pupo, CR Currie. "New antibiotics from insect microbiomes." *Under review*.
- P8 N Liu,* H Li,* **MG Chevette**, L Zhang, L Cao, H Zhou, X Zhou, Z 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." *Under review*.
- P7 N Adnani, **MG Chevette**, 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. (2017). "Co-culture of Marine Invertebrate-Associated Bacteria and Interdisciplinary Technologies Enable Biosynthesis and Discovery of a New Antibiotic, Keyicin." **ACS Chemical Biology**, 12(12), 3093. [Click here](#)
- [Highlighted by Nature, [Click here](#)]
- P6 AF Sanchez-Larrayoz, NM Elshamy, **MG Chevette**, Y Fu, P Giunta, RG Spallanzani, K Ravi, GB Pier, S Lory, T Maira-Litrán. (2017). "Complexity of Complement-Resistance Factors Expressed by *Acinetobacter baumannii* Needed for Survival in Human Serum." **Journal of Immunology**, 199: j11700877. [Click here](#)
- P5 **MG Chevette**, F Aicheler, O Kohlbacher, CR Currie, MH Medema. (2017). "SANDPUMA: Ensemble Predictions of Nonribosomal Peptide Chemistry Reveals Biosynthetic Diversity across Actinobacteria." **Bioinformatics**, 2017, 1–9. [Click here](#)
- P4 IJ Miller, **MG Chevette**, JC Kwan. (2017). "Interpreting Microbial Biosynthesis in the Genomic Age: Biological and Practical Considerations." **Marine Drugs**, 15(6), 165. [Click here](#)
- [Cover Image for Issue 6, Volume 15 in June 2017]
- P3 K Blin, T Wolf, **MG Chevette**, 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. (2017). "antiSMASH 4.0 - Improvements in Chemistry Prediction and Gene Cluster Boundary Identification." **Nucleic Acids Research**, 45(1), 1019–1037. [Click here](#)
- P2 GR Lewin, C Carlos, **MG Chevette**, HA Horn, BR McDonald, RJ Stankey, BG Fox, CR Currie. (2016). "Ecology and Evolution of Actinobacteria and their Bioenergy Applications." **Annual Review of Microbiology**. 70: 235–254. [Click here](#)
- P1 SS Johnson, **MG Chevette**, BL Ehlmann, KC Benison. (2015). "Insights from the Metagenome of an Acid Salt Lake: the Role of Biology in an Extreme Depositional Environment." **PLOS ONE**. 2015 Apr; 10(4):e0122869. [Click here](#)

INVITED TALKS

- T4 “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.
- T3 “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.
- T2 “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, [Click here](#)]
- T1 “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, [Click here](#)]

PATENTS

- Q1 DC Gray, E Li, BR Bowman, GL Verdine, K Robison, **MG Chevrette**, D Udway, PS Wang, A Li, JP Morgenstern. Compositions and Methods for the Production of Compounds. Publication Number WO/2018/081590. Patent Application PCT/US2017/058800, filed Oct 27, 2017. [Click here](#)

EDITORIAL REVIEW ONLY

- E5 **MG Chevrette**. (2018). “Natural Products Reawakened: New Trends in Discovery and Development.” *SIMB News Magazine*, Society for Industrial Microbiology and Biotechnology, In press.
- E4 DR Braun, **MG Chevrette**, D Acharya, CR Currie, SR Rajski, TS Bugni. (2018). “Draft Genome of *Micromonospora* sp. WMMA1996, a Marine Sponge-associated Bacterium.” *Genome Announcements*, 6(8), e00077-18. [Click here](#)
- E3 DR Braun, **MG Chevrette**, D Acharya, CR Currie, SR Rajski, K Ritchie, TS Bugni. (2018). “Complete Genome of *Dietzia* sp. WMMA184, a Marine Coral-associated Bacterium.” *Genome Announcements*, 6(5), e01582-17. [Click here](#)
- E2 N Adnani, DR Braun, BR McDonald, **MG Chevrette**, CR Currie, TS Bugni. (2017). “Draft Genome of *Micromonospora* sp. WMMB-235, a Marine Ascidian-associated Bacterium.” *Genome Announcements*, 5(2), 1-2. [Click here](#)
- E1 N Adnani, DR Braun, BR McDonald, **MG Chevrette**, CR Currie, TS Bugni. (2016). “Complete Genome Sequence of *Rhodococcus* sp. Strain WMMA185, a Marine Sponge-Associated Bacterium.” *Genome Announcements*, 4(6), 1-2. [Click here](#)

ABSTRACTS

- A23 **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.
- A22 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.
- A21 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 - Bioanalytical & Omics Science, Wroclaw, Poland; Nov 18, 2017.
- A20 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.
- A19 AF Sanchez-Larrayoz, NM Elhosseiny, **MG Chevrette**, Y Fu, P Giunta, G Spallanzani, GB Pier, S Lory, T Maira-Litrán. “The Membrane Lipid Asymmetry Transport System Plays a Key Role in Protecting *Acinetobacter baumannii* against Killing by Human Complement Killing via the Alternative Pathway.” Presented at: American Society for Microbiology Microbe, New Orleans, LA; Jun 2, 2017.
- A18 **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.
- A17 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.
- A16 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.
- A15 **MG Chevrette**, CR Currie, MH Medema. “prediCAT: An Accurate Predictive Method for Substrate Specificity of Nonribosomal Peptide Synthetase Adenylation Domains.” Presented at: 30th Annual Kenneth B. Raper Symposium on Microbial Research; Madison, WI; Sep 2, 2016.

- A14 J Bratburd, BR McDonald, **MG Chevrete**, JL Klassen, HA Horn, CR Currie. "Comparative Genomics of Fungus-growing Ant-associated Pseudonocardia." Presented at: 30th Annual Kenneth B. Raper Symposium on Microbial Research; Madison, WI; Sep 2, 2016.
- A13 HA Horn, E Gemperline, **MG Chevrete**, 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.
- A12 **MG Chevrete**, 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.
- A11 SS Johnson, ML Soni, DJ Collins, KC Benison, MR Mormile, **MG Chevrete**, 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.
- A10 **MG Chevrete**, 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.
- A9 N Adnani, S Adibhatla, E Vazquez-Rivera, GA Ellis, D Braun, **MG Chevrete**, 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.
- A8 **MG Chevrete**, DW Udway, CR Currie, SS Johnson. "Functional Classification and Secondary Metabolism of an Extreme Metagenome." Presented at: 29th Annual Kenneth B. Raper Symposium on Microbial Research; Madison, WI; Sep 1, 2015.
- A7 **MG Chevrete**, 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.
- A6 **MG Chevrete**, M Vinacur, T Maira-Litrán. "Transposon-Directed Insertion Site Sequencing Reveals *in vivo* Fitness Factors in *A. baumannii* Lung Infections." Presented at: Boston Bacterial Meeting; Cambridge, MA; Jun 18-19, 2015.
- A5 DW Udway, K Robison, **MG Chevrete**, GL Verdine. "Lessons from Long Read Assembly of 100+ Actinomycete Genomes." Presented at: Gordon Marine Natural Products; Ventura, CA; Mar 2-7, 2014.
- A4 K Robison, DW Udway, **MG Chevrete**, GL Verdine. "Long Read Assembly of >100 Actinomycete Genomes." Presented at: Advances in Genome Biology & Technology; Marco Island, FL; Feb 12-15, 2014.
- A3 S Young, S Steelman, R Daza, **MG Chevrete**, 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.
- A2 S Steelman, R Daza, **MG Chevrete**, 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.
- A1 S Steelman, R Daza, **MG Chevrete**, 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

Ira L Baldwin Distinguished Predoc. Fellowship for Excellence in Research	Bacteriology – UW-Madison	05/2018–04/2019
Chemistry-Biology Interface Predoctoral Fellowship	National Institutes of Health, NIGMS – UW-Madison	06/2016–03/2018
Passed with Distinction	Preliminary Examination A - Dept. of Genetics - UW-Madison	07/2017
Issue Cover	Marine Drugs 15(6): 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 Frontiers in Microbiology, FEMS Microbiology Letters, Microbial Cell Factories	
Evolution Coordinating Committee JF Crow Institute for the Study of Evolution – UW-Madison	01/2017–present
Mentor Google Summer of Code – antiSMASH – Open Bioinformatics Foundation	03/2016–09/2017
Co-chair Computational Biology, Ecology, & Evolution (ComBEE) – UW-Madison	01/2016–present
Co-organizer Discovery Niche – Wisconsin Institutes for Discovery	10/2015–11/2015
Volunteer Wisconsin Science Festival	10/2015
Open Genomics Adviser Revive & Restore – Long Now Foundation	04/2014–10/2015
Environmental, Health, and Safety Representative Broad Institute of MIT & Harvard	01/2011–03/2013

Teaching Experience

Genetics 468: General Genetics II UW-Madison	Sp 2016
Microbiology 450: Diversity, Ecology, & Evolution of Microorganisms UW-Madison	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