

April M. Goebel - Curriculum Vitae

april.goebel@botanicgardens.org

Education

2021	Doctor of Philosophy; University of Colorado Boulder, CO, USA; Ecology and Evolutionary Biology; Advisors: Drs. Daniel Doak and Nolan Kane
2021	Doctoral Certificate in Interdisciplinary Quantitative Biology; University of Colorado Boulder, CO, USA; BioFrontiers Institute
2010	Master of Science; University of Victoria, BC, Canada; Molecular Biology
2007	Bachelor of Science (with distinction); University of Victoria, BC, Canada; Biology

Research

2023-present	Assistant Research Scientist; Denver Botanic Gardens, CO
2021-2022	Postdoctoral Researcher; Denver Botanic Gardens, CO
2020	Research Intern funded by NSF INTERN Program; Denver Botanic Gardens, CO
2015-21	Graduate Researcher (Ph.D.); University of Colorado Boulder, CO
2011-15	Research Assistant II; Salk Institute for Biological Studies, CA
2008-10	Laboratory Technician; University of Victoria, BC
2007-10	Graduate Researcher (M.Sc.); University of Victoria, BC

Teaching

2019 & 20	Teaching Assistant: Genomics; University of Colorado Boulder, CO
2019	Teaching Assistant: General Biology; University of Colorado Boulder, CO
2017	Teaching Assistant: Principles of Ecology; University of Colorado Boulder, CO
2010	Laboratory Coordinator & Instructor: Techniques in Molecular Biology; University of Victoria, BC
2009	Guest Lecture: Human Molecular Genetics; University of Victoria, BC
2008 & 09	Teaching Assistant: Principles of Genetics; University of Victoria, BC

Publications

In preparation

1. Optimizing the use of demographic data for threatened species when there are planned or unplanned missing data; the case of *Eriogonum brandegeei*. **A Goebel**, M DePrenger-Levin, R Hufft, D Doak.

Peer-reviewed

11. Adaptation to distinct habitats is maintained by contrasting selection at different life stages in sunflower ecotypes. **A Goebel**, N Kane, D Doak, L Rieseberg, K Ostevik. **Molecular Ecology**. **2022**.

10. Empirical test of increasing genetic variation via inter-population crossing for native plant restoration in variable environments. **A Goebel**, D Doak, N Kane. **Restoration Ecology**. **2022**.

9. Complete mitochondrial genomes provide current refined phylogenomic hypotheses for relationships among ten *Hirundo* species. J Carter, P Innes, **A Goebel**, B Johnson*, M Gebert, Z Attia, Z Gabani*, R Li, T Melie, C Dart*, A Mares*, C Greidanus*, J Paterson*, B Wall*, G Cortese*, K Thirouin, G Glime, J Rutten*, C Poyd*, E Post*, A Elhadi*, K Feldmann*, A Danz, T Blanchard*, S Amato*, S Reinert, C Pogoda, E Scordato, A Hund, R Safran, N Kane. **Mitochondrial DNA Part B. 2020.** (* undergraduate student mentees as a part of a CURE course).
8. Patterns of soil bacterial richness and composition tied to plant richness, soil nitrogen, and soil acidity in alpine tundra. X Yuan, J Knelman, D Wang, **A Goebel**, E Gasarch & T R Seastedt. **Arctic, Antarctic, and Alpine Research. 2017.**
7. *In vivo* genome editing via CRISPR/Cas9 mediated homology-independent targeted integration. K Suzuki, Y Tsunekawa, R Hernandez-Benitez, J Wu, J Zhu, E J Kim, F Hatanaka, M Yamamoto, T Araoka, Z Li, M Kurita, T Hishida, M Li, E Aizawa, S Guo, S Chen, **A Goebel**, R D Soligalla, J Qu, T Jiang, X Fu, M Jafari, C R Esteban, W T Berggren, J Lajara, E Nuñez-Delicado, P Guillen, J M Campistol, F Matsuzaki, G-H Liu, P Magistretti, K Zhang, E M Callaway, K Zhang, J-C Izpisua Belmonte. **Nature. 2016.**
6. A Werner syndrome stem cell model unveils heterochromatin alterations as a driver of human aging. W Zhang, J Li, K Suzuki, J Qu, P Wang, J Zhou, X Liu, R Ren, X Xu, A Ocampo, T Yuan, J Yang, Y Li, L Shi, D Guan, H Pan, S Duan, Z Ding, M Li, F Yi, R Bai, Y Wang, C Chen, F Yang, X Li, Z Wang, E Aizawa, **A Goebel**, R D Soligalla, P Reddy, C Rodriguez Esteban, F Tang, G-H Liu, J-C Izpisua Belmonte. **Science. 2015.**
5. Targeted gene correction minimally impacts whole-genome mutational load in human-disease-specific induced pluripotent stem cell clones. K Suzuki, C Yu, J Qu, M Li, X Yao, T Yuan, **A Goebel**, S Tang, R Ren, E Aizawa, F Zhang, X Xu, R D Soligalla, F Chen, J Kim, N Kim, H-K Liao, C Benner, C Rodriguez Esteban, Y Jin, G-H Liu, Y Li & J-C Izpisua Belmonte. **Cell Stem Cell. 2014.**
4. Modelling Fanconi anemia pathogenesis and therapeutics using integration-free patient-derived iPSCs. G-H Liu, K Suzuki, M Li, J Qu, N Montserrat, C Tarantino, Y Gu, F Yi, X Xu, W Zhang, S Ruiz, N Plongthongkum, K Zhang, S Masuda, E Nivet, Y Tsunekawa, R D Soligalla, **A Goebel**, E Aizawa, N Kim, J Kim, I Dubova, Y Li, R Ren, C Benner, A del Sol, J Bueren, J Pablo Trujillo, J Surralles, E Cappelli, C Dufour, C Rodriguez Esteban & J-C Izpisua Belmonte. **Nature Communications. 2014.**
3. Progressive degeneration of human neural stem cells caused by pathogenic LRRK2. G-H Liu, J Qu, K Suzuki, E Nivet, M Li, N Montserrat, F Yi, X Xu, S Ruiz, W Zhang, B Ren, U Wagner, A Kim, Y Li, **A Goebel**, J Kim, R D Soligalla, I Dubova, J Thompson, J Yates III, C Rodriguez Esteban, I Sancho-Martinez & J-C Izpisua Belmonte. **Nature. 2012.**
2. Targeted gene correction of laminopathy-associated LMNA mutations in patients-specific iPSCs. G-H Liu, K Suzuki, J Qu, I Sancho-Martinez, F Yi, M Li, S Kumar, E Nivet, J Kim, R D Soligalla, I Dubova, **A Goebel**, N Plongthongkum, H-L Fung, K Zhang, J Loring, L Laurent & J-C Izpisua Belmonte. **Cell Stem Cell. 2011.**
1. Gaucher disease with prenatal onset and perinatal death due to compound heterozygosity for the missense R131C and null RecNciI GBA mutations. **A Goebel**, R Ferrier, P Ferreira, A Pinto-Rojas, E Matshes & F Choy. **Pediatric Developmental Pathology. 2010.**

Reports

3. Annual Technical Report to the Bureau of Land Management: Experiments to inform seed source selection for ecological restoration in grasslands. **A Goebel, M Clark, R Hufft. 2023.**
2. Dissertation: Factors Affecting Establishment, Adaptation, and Persistence of Small Populations in Variable Environments. **A Goebel. 2021.**
1. Contributing author on: IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services) Land Degradation and Restoration Assessment Chapter 3: Direct and indirect drivers of land degradation and restoration. **2018.**

Annotated genomes

First author of two and co-author of 51 assembled and annotated organellar genomes published on NCBI GenBank:

Parmotrema stuppeum (KY362439), *Lecanora cinereofusca* (KY594675), *Hirundo rustica transitiva* (MN840495, MN954681), *Hirundo rustica tyleri* (MN843972), *Hirundo rustica rustica* (MN829439), *Hirundo rustica savignii* (MN830163), *Hirundo smithii* (MN853142, MN629932, MN849178), *Hirundo tahitica* (MN833781, MN849306), *Hirundo nigrita* (MN849307, MN832899), *Hirundo neoxena* (MN848412, MN844886), *Hirundo dimidiata* (MT471263, MN832869), *Hirundo atrocaerulea* (MT442038), *Hirundo angolensis* (MN849177), *Hirundo albigularis* (MN829450), *Hirundo aethiopica* (MN850676, MN844887), *Delichon urbicum* (MT427586, MN832895, MN824431, MN853682), *Helianthus atrorubens* (MW375413), *Helianthus schweinitzii* (MW381301), *Helianthus silphioides* (NC_058798, MW375415), *Helianthus verticillatus* (NC_058797, MW375414), *Helianthus atrorubens* (NC_058796, MW375413), *Helianthus simulans* (MW366800), *Helianthus cusickii* (MW366799), *Helianthus nuttallii* (MW366798), *Helianthus angustifolius* (MW366797), *Helianthus floridanus* (MW351833), *Helianthus microcephalus* (MW351834), *Helianthus laciniatus* (MW353165), *Linum lewisii* (MW375416, NC_058799), *Linum strictum* (MW364865), *Linum leonii* (MW365714), *Linum narbonense* (NC_058855), *Linum grandiflorum* (NC_058845, MW387225), *Linum stelleroides* (MW366796), *Linum decumbens* (MW366795), *Linum perenne* (MW366794), *Linum narbonense* (MW376864).

Awards and Fellowships

2020	NSF INTERN Graduate Student Supplemental Funding; 49,707\$USD
2018-19	NSERC Postgraduate Award Doctoral Level; 42,000\$CAD
2018	University of Colorado Boulder UGGS Student Group Event Grant; 750\$USD
2017	University of Colorado Boulder Student Competitive Travel Grant; 300\$USD
2015-17	University of Colorado Interdisciplinary Quantitative Biology PhD Fellow; 60,000\$USD
2008	NSERC Postgraduate Award Masters Level; 17,300\$CAD
2007	Pacific Century Grad Scholarship, BC Provincial Award; 10,000\$CAD
2007	University of Victoria Graduate Award; 3,500\$CAD

Academic Service & Outreach

2022	Career and science Q&As with students from Community College of Denver, STEM School Highlands Ranch
2018-present	Reviewer for Molecular Ecology, The American Naturalist
2018-19	EBIO faculty search committee elected graduate student representative; University of Colorado Boulder
2018-19	Interdisciplinary Quantitative Biology Symposium co-organizer; University of Colorado Boulder

2017-2019 Mentored 6 undergraduate students in research projects, University of Colorado Boulder
2017 EBIO non-academic careers panel co-organizer; University of Colorado Boulder
2017 & 20 EBIO new graduate student orientation panelist; University of Colorado Boulder
2016-17 Science Research Seminar mentor; Boulder Valley School District
2016 Controversial Topics Teaching Workshop volunteer; University of Colorado Boulder
2007-09 Biology Graduate Symposium co-organizer; University of Victoria, BC

Community Service

2018-2021 Court Appointed Special Advocate (CASA) for children who are victims of abuse or neglect; Boulder County, CO
2013-14 English Language Tutor for Refugees; International Rescue Committee, San Diego, CA
2013-14 Science Education Public Outreach; Salk Institute, La Jolla, CA
2013 International Volunteer and Educator; Kipepeo Community Empowerment Program, Kimia, Kenya
2010 Species Biodiversity Surveyor; Operation Wallacea, Cusuco National Park, Honduras
2008-09 Special Olympics Track and Field Coach; Victoria, BC
2004-10 Birth Control Educator and Doctor's Assistant; Island Sexual Health, Victoria, BC
2004 & 06 Childcare and Tutor; Sri Ram Orphanage, Uttaranchal, India

Conferences

Invited Talks

2019 Evolution Meetings - Selection at different life history stages drives allele frequency change and maintains divergent adaptation in the face of gene flow.

Contributed Talks

2022 Ecological Society of America - Optimizing the use of demographic data for threatened species; the case of *Eriogonum brandegeei*.
2020 North American Congress for Conservation Biology Virtual Conference - Studying the effects of increased genetic diversity for plant population conservation in variable environments.
2019 Society for Ecological Restoration: Rocky Mountains Chapter Conference - Expanded genetic variation in prairie sunflower inter-population crosses for potential native plant restoration in variable environments.

Poster Presentations

2022 Society for Ecological Restoration: Rocky Mountains Chapter Conference - Assessing local adaptation and evolutionary potential in common grassland species to inform seed selection for restoration.
2017 Evolution Meetings - Population genomic study of adaptive divergence in a dune sunflower.
2016 Evolution Meetings - Adaptation of Sunflowers to an Extreme Environment.
2016 Colorado Seed Network Conference - Differences in Survival & Performance Across a Range of Wild Sunflower Ecotypes.

Workshops

2020 & 22 Population Genomics and Conservation Genetics Online Course/ Workshop; University of Montana
2018 Statistical Genetics Summer Institute; University of Washington
2017 Environmental Genomics; Mount Desert Island Biological Laboratory, Maine

Computational Programs and Platforms

R, bash, linux, high performance computing (HPC), GitHub, LaTeX

Computational Research Methods

Reproducible bioinformatic workflows to clean short read sequence data, align sequence reads to a reference genome, and call variants; *de novo* genome assembly, annotation, and submission to NCBI GenBank.