Loren Cassin Sackett

Assistant Professor, Department of Integrative Biology
University of South Florida
4202 E. Fowler Ave, SCA 303, Tampa, FL 33620-8100
Center for Conservation Genomics, Smithsonian Conservation Biology Institute
phone: (720) 201-8459 | email: Loren.Sackett@gmail.com
website: http://www.colorado.edu/eeb/sackett

EDUCATION

Ph.D, Ecology and Evolutionary Biology, University of Colorado, December 2012.

Dissertation title: **Dispersal, diversity and divergence: evolutionary processes in prairie dogs (genus *Cynomys*).**

Advisor: Andrew P. Martin
Committee: Patrik Nosil
Robert P. Guralnick
Sharon K. Collinge
Alan R. Templeton (Washington University in St. Louis)

B.A., Psychology, Whitman College, 2003.

Thesis title: **Perceptual differences between native English- and Spanish-speakers using their first or second language**.

Advisor: Matthew Prull

RESEARCH INTERESTS

I am interested in the processes that drive the distribution of genetic diversity within and among species, with a focus on the contrast between host adaptation to novel and historical selection pressures. I am especially keen on using genomics to understand the mechanisms underlying the evolution of resistance to introduced pathogens.

RESEARCH EXPERIENCE

2013-2016: **Genomics of Tolerance to Avian Malaria in Hawai'i amakihi (*Hemignathus virens*).** Postdoctoral research; advisor: Robert C. Fleischer, Center for Conservation Genomics, Smithsonian Institution, Washington D.C.

2008-2012: **Assessment of ecological and genetic divergence between Gunnison's prairie dog subspecies**. Dissertation research; advisor: Andrew P. Martin, University of Colorado, Boulder CO

2006-2010: **Does sylvatic plague reduce genetic variability of black-tailed prairie dogs? Variable effects across scales**. Dissertation research; advisor: Andrew P. Martin, University of Colorado, Boulder CO

2005-2006: **Landscape effects on disease dynamics in prairie dogs**. Research assistant; advisors: Andrew P. Martin and Sharon K. Collinge, University of Colorado, Boulder CO

2003-2005: **Analysis of nutrient status in alpine soils of Colorado**. Research assistant; advisor: M. Iggy Litaor, Institute for Arctic and Alpine Research (INSTAAR) and University of Colorado, Boulder CO.

2002-2003: **Perceptual differences between native English- and Spanish-speakers using their first or second language**. Undergraduate thesis; advisor: Matthew Prull, Whitman College, Walla Walla WA.

RESEARCH AND TRAINING GRANTS — Total $260,488

2016: **United States Fish and Wildlife Service**. *Population genetic analysis to guide emergency management actions for two crashing endangered species, Kauai Island's Akikiki and Akeke'e* (co-PI) $14,504

2016: **Friends of the National Zoo** Conservation Grant. *Genomic analysis of severely endangered Hawaiian honeycreepers in support of captive propagation* (co-PI). $5,000

2015: **National Geographic Society**'s Committee for Research and Exploration research grant. *Genomics of Resistance to Avian Malaria in Hawaiian Honeycreepers.* $22,701

2015: **Smithsonian Institution** Competitive Grants Program for Science. *Genomics of Resistance to Avian Malaria in Hawaiian Amakihi* (co-PI). $99,500

2013: **Smithsonian Institution** postdoctoral research grant. *Genomics of Resistance to Avian Malaria in Hawaii Amakihi (Hemignathus virens)* $4,000

2013: **RocketHub crowdfunding**, *Soil Microbial Communities in Prairie Dog Burrows* $2,130

2010: **Colorado Division of Wildlife**: *Comparison of Migration Potential, Inbreeding, and Flea Ecology in the Candidate and Non-candidate Portion of the Gunnison's Prairie Dog Range in Colorado* (co-PI) $50,000

2010: Beverly Sears graduate student grant, **University of Colorado** $1,000

2009: **National Science Foundation** GK-12 International Research Partnership: *Ecology of McMurdo Dry Valleys, Antarctica* (PI: Lesley Smith; written by Susan Whitehead, Loren C. Sackett, Kallin Tea and Philip Taylor) $42,516

2009: EEB department grant, **University of Colorado** $2,500

2009: **Boulder County Nature Association** grant $1,000

2009: Undergraduate Research Opportunities Program (training grant), **University of Colorado** $2,000

2009: **University of Colorado Natural History Museum** Award, University of Colorado $1,194

2009: Verona Walker Award, **University of Colorado** $2,000

2008: Undergraduate Research Opportunities Program (training grant), **University of Colorado** $3,000

2008: EEB department grant, **University of Colorado** $2,000

2008: **Boulder County Nature Association** grant $1,000

2008: **University of Colorado Natural History Museum** Walker Van Riper grant $1,000

2008: Beverly Sears graduate student grant, **University of Colorado** $993

2007: EEB department grant, **University of Colorado** $2,450

FELLOWSHIPS AND AWARDS — Total $185,350

2013:	Post-Doctoral Fellowship, Smithsonian Institution: Genomics of Resistance to Avian Malaria in Hawaii Amakihi (*Hemignathus virens*)	$45,000
2012:	Graduate School Dissertation Completion Fellowship, University of Colorado	$14,000
2011:	EEB Rosella Smith Fellowship, University of Colorado	$13,000
2011:	ARCS Foundation Achievement Award, University of Colorado	$5,000
2011:	Finalist, W.D. Hamilton Award for Outstanding Student Talk, Society for the Study of Evolution	
2010:	ARCS Foundation Achievement Award, University of Colorado (declined)	$5,000
2009:	EEB Excellence in Teaching Award, University of Colorado	$200
2009:	NSF GK-12 Teaching Fellowship	$45,000
		+ $22,500 education allowance
2009:	EEB fellowship to attend Organization for Tropical Studies short course	$2,850
2008:	EEB fellowship to attend Organization for Tropical Studies short course	$2,800
2003:	Dean's List, University of Colorado, Boulder CO	
2001:	Dean's List, Whitman College, Walla Walla WA	
1999:	Whitman Brattain Achievement Scholarship, Whitman College	$30,000

PEER-REVIEWED PUBLICATIONS *(*undergraduate author; §authorship by high school teacher)*

G. Castellanos-Morales, J. Ortega, R. Castillo-Gámez, **L.C. Sackett**, L. Eguiarte 2015. Genetic variation and structure in contrasting geographic distributions: widespread vs. restricted black-tailed prairie dogs (subgenus *Cynomys*). *Journal of Heredity* 106: 478 – 490.

L.C. Sackett, A. Seglund, R.P. Guralnick, M.N. Mazzella*, D.M. Wagner, J.D. Busch, A.P. Martin 2014. Evidence for two subspecies of Gunnison's prairie dogs (*Cynomys gunnisoni*), and the general importance of the subspecies concept. *Biological Conservation* 174: 1 – 11.

L.C. Sackett, S.K. Collinge, A.P. Martin 2013. Do pathogens reduce genetic diversity of their hosts? Variable effects of sylvatic plague in black-tailed prairie dogs. *Molecular Ecology* 22: 2441-2455.

L. C. Sackett, T. B. Cross*, R. T. Jones, W. Johnson, K. Ballare, C. Ray, S. Collinge, A. P. Martin 2012. Connectivity of prairie dog colonies in an altered landscape: inferences from analysis of microsatellite DNA variation. *Conservation Genetics* 13: 407-418.

S. H. Paull, S. Song, K. M. McClure, **L. C. Sackett**, M. Kilpatrick, P. T. J. Johnson 2012. From superspreaders to disease hotspots: linking transmission across hosts and space. *Frontiers in Ecology and the Environment* 10(2): 75-82.

L. C. Sackett, L. K. Etchberger, M. N. Mazzella*, D. D. Lim*, A. P. Martin 2010. Characterization of 18 microsatellite loci for three species of prairie dogs. *Molecular Ecology Resources* 10(1): 232-236.

J.M. Basey, **L. C. Sackett,** N.S. Robinson 2008. Optimal science lab design: impacts of various components of lab design on students' attitudes toward lab. *International Journal for the Scholarship of Teaching and Learning* 2(1), Article 15.

M. I. Litaor, T. R. Seastedt, **L. C. Sackett** 2008. An analysis of the nutrient status of alpine soils of the Colorado Front Range using the N:P ratio index. *Soil Science Society of America Journal* 72(6): 1628-1636.

MANUSCRIPTS IN REVIEW AND IN PREPARATION

E.A. Pikcilingis*, **L.C. Sackett**, Y. Bai, M. Kosoy, S.K. Collinge, A.P. Martin. Island biogeography of pathogen genotype richness in prairie dogs. In revision for *Oecologia*.

L.C. Sackett, T.E. Callicrate, R.C. Fleischer. Multiple disease-related genes implicated in survivorship to malaria in a Hawaiian honeycreeper. *Evolution*. To be submitted 08/16.

L.C. Sackett. Does the host matter? Variation in flea abundance on black-tailed prairie dogs is not explained by intrinsic host factors. *Journal of Vector Ecology*. To be submitted 10/16.

L.C. Sackett, E.H Paxton, and R.C. Fleischer. Spatial variation in gene expression across an elevational gradient in Hawaii. In preparation.

OTHER PUBLICATIONS

A. P. Martin and **L. C. Sackett** 2012. Assessing the subspecies status within *Cynomys gunnisoni*. Final report prepared for the Colorado Division of Wildlife, Denver, CO.

L. C. Sackett 2009. Recolonization after plague in black-tailed prairie dogs. Final report prepared for the Boulder County Nature Association, Boulder, CO. Available at http://bcna.org/library/Sackett_finalreport09.pdf.

L. C. Sackett 2008. Post-plague recolonization in black-tailed prairie dogs. Final report prepared for Boulder Open Space and Mountain Parks, Boulder, CO.

L. C. Sackett 2007. Genetic effects of post-plague recolonization in black-tailed prairie dogs. Final report prepared for Boulder County Open Space, Longmont, CO.

F.M. Dunnivant, L. DeMuth, S. Ferguson, R. Kormanyos, S. McConnell, **L. Sackett**, J. Schulte 2006. Environmental Laws. In: *A Basic Introduction to Pollutant Fate and Transport: An Integrated Approach with Chemistry, Modeling, Risk Assessment, and Environmental Legislation*, F.M. Dunnivant, E. Anders. John Wiley & Sons Inc., Hoboken, NJ.

INVITED SEMINARS

L.C. Sackett. Evolutionary responses of naïve hosts to novel pathogens. **University of South Florida** (2016), Tampa, FL.

L.C. Sackett. Evolutionary responses of naïve hosts to introduced pathogens. **University of Virginia** (2015), Charlottesville, VA.

L.C. Sackett, T.E. Callicrate and R.C. Fleischer. Genomics of adaptation to avian malaria in the

Hawai'i 'amakihi. **Malaria RCN** (2015), Shepherdstown, WV.

L. C. Sackett. Does plague reduce genetic diversity of prairie dogs? Variable effects across scales. **Smithsonian Conservation Biology Institute** (2013), Washington, D.C.

L. C. Sackett. Assessment of subspecies status of Gunnison's prairie dogs (*Cynomys gunnisoni*). **Prairie Dog Conservation Team Annual Meeting** (2012), Fort Collins, CO.

L.C. Sackett. Effects across scales of sylvatic plague on genetic diversity in black-tailed prairie dogs. **City of Boulder Open Space and Mountain Parks** (2012), Boulder, CO.

L. C. Sackett. Does plague cause rapid evolution of prairie dogs in Boulder County? **Graduate Student Evolution Symposium, University of Colorado Museum** (2010), Boulder, CO.

L. C. Sackett. Graduate research on disease driving evolution of prairie dogs. **Graduate School Advisory Board quarterly meeting** (2009), Boulder, CO.

CONTRIBUTED PRESENTATIONS

L.C. Sackett, T.E. Callicrate and R.C. Fleischer. Exposure to avian malaria drives evolution of disease-related genes in the Hawaii amakihi. **Evolution** (2016), Austin, TX. Video available at https://www.youtube.com/watch?v=u8iotGtFqL8.

L.C. Sackett, T.E. Callicrate and R.C. Fleischer. Exposure to avian malaria drives evolution of disease-related genes in a Hawaiian honeycreeper. **Ecology and Evolution of Infectious Diseases** (2016), Ithaca, NY. *Poster presentation.*

L.C. Sackett, T.E. Callicrate and R.C. Fleischer. Genomics of tolerance to avian malaria in the Hawai'i 'amakihi. **Evolution** (2015), Guarujá, Brasil. Video available at https://www.youtube.com/watch?v=HyFSq3omWis .

L.C. Sackett, T.E. Callicrate and R.C. Fleischer. Genomics of resistance to avian malaria in a Hawaiian honeycreeper. **Ecology and Evolution of Infectious Diseases** (2015), Athens, GA. *Poster presentation.*

L. C. Sackett. Plague extirpations increase genetic diversity of prairie dogs across scales. **Dissertation Seminar, University of Colorado** (2012), Boulder, CO.

L. C. Sackett, A. Seglund and A.P. Martin. Ecological and genetic divergence between Gunnison's prairie dog (*Cynomys gunnisoni*) subspecies. **Ecological Society of America** (2012), Portland, OR.

L. C. Sackett, K. Tea, S.R. Whitehead, I. Schwartz§, R.A. Virginia, D. Wall. Spatial heterogeneity of biogeochemistry and respiration in exposed and subnivian soils in McMurdo Dry Valleys, Antarctica. **Ecological Society of America** (2011), Austin, TX. *Poster presentation.*

L.C. Sackett, S.K. Collinge, A.P. Martin. The influence of sylvatic plague on genetic diversity in black-tailed prairie dogs. **Evolution** (2011), Norman, OK.

L.C. Sackett, S.K. Collinge, A.P. Martin. Plague extirpations increase genetic diversity in black-tailed prairie dog populations. **Evolution** (2010), Portland, OR. *Poster presentation.*

L. C. Sackett. Population-wide response of prairie dogs to sylvatic plague. **University of Colorado**

Museum (2010), Boulder, CO.

L. C. Sackett. Prairie dog re-colonization after plague. **University of Colorado Museum** (2009), Boulder, CO.

L. C. Sackett. Perceptual differences between native English- and Spanish-speakers. **Whitman Undergraduate Conference** (2003), Walla Walla, WA.

WORKSHOPS AND SKILL DEVELOPMENT

2014:	Programming for Evolutionary Biology, Leipzig, Germany
2013:	Evolutionary Quantitative Genetics, NESCent Academy, Durham NC
2012:	Software Carpentry Workshop, Washington University in St Louis, St Louis, MO
2012:	Next-Generation Sequencing Workshop, Ottawa, Canada
2012:	Estimating Species Trees, The Ohio State University, Columbus, OH
2009:	Conservation and Adaptive Management (Organization for Tropical Studies), Las Cruces Biological Station, Costa Rica
2008:	International Plague Symposium, Fort Collins, CO
2008:	NSF/University of Colorado LEAP Professional Development Workshop, Boulder, CO
2008:	Conservation and Biodiversity Genetics (Organization for Tropical Studies), Palo Verde Research Station, Costa Rica

SERVICE, OUTREACH AND AFFILIATIONS

2006-present: <u>Professional Service</u>:

Representative, Conservation Genetics branch, Smithsonian Biodiversity Genomics Initiative

Chair (3 years) and Representative (2 years), Teaching Evolution Outreach Committee, University of Colorado

Co-organizer (4 years), Teaching Evolution Workshop for high school teachers (attracts ~100 teachers annually from Colorado and Wyoming)

Co-organizer, Smithsonian Conservation Biology Institute seminar series

Co-organizer, Animal Disease Symposium (Smithsonian Conservation Biology Institute)

Representative (5 years), Colloquium Committee (University of Colorado)

Founder and Chair (3 years), Undergraduate-Graduate mentoring program (University of Colorado)

Representative (3 years), Spring Symposium Committee (University of Colorado)

2010-present: <u>Research-based Outreach Activities</u>:

Smithsonian National Zoo events: Autumn Conservation Festival (thousands of attendees, Smithsonian Conservation Biology Institute); research presentation to Small Mammal House Volunteers (30 attendees)

Thomas Jefferson High School lab visit (30 students)

Sherwood High School lab visit (50 students)

Goldrick Elementary School lab visit (75 students)

D.C. Science Writers Association lab visit (12 writers)

Author, In The Light of Evolution blog

Coauthor, Project Extremes blog (https://extremesantarctica.wordpress.com/)

2008-present: Activities to Advance Women in Science:
Founder and Chair, Professional Development series (biweekly workshops, Smithsonian Conservation Biology Institute, 95% women)
Representative, Women in Science Solutions Forum (Smithsonian Institution)
Graduate Student Co-Chair, Nag's Heart organization for women in STEM (University of Colorado)

2012-present: Reviewer: *Biological Conservation* (1), *Ecology and Evolution* (1), *Journal of Biogeography* (1), *Journal of Heredity* (1), *Molecular Ecology* (5), *PLoS One* (2), *Therya* (1)

2008-present: Society Memberships: Society for the Study of Evolution; American Society of Naturalists; Wildlife Disease Association; Ecological Society of America; Society for Conservation Biology

2006-present: Student Training:

Undergraduate students mentored: Erin Arnold Pikcilingis, Max Mazzella, Silas Tittes, Corey Fulton, Su Lai, August Jensen, Hayden Gardner, Monica Burley, Audrey Tobin, Nick Vinciguerra
Graduate students mentored: Sierra Love Stowell, Sara Hellmuth Paull, Sarah Orlofske, Abbey Paulson, Evelyn Cheng

TEACHING EXPERIENCE:

Course Development:
The Influence of Humans on Evolutionary Processes, Smithsonian Adult Education Program (2014)

Research Assistantships:
Transforming Undergraduate Education in Ecology and Evolutionary Biology (2012)
Evaluation of Lab Design in Engaging General Biology Students (2007)

Teaching Assistantships:
Evolutionary Biology, University of Colorado (2008, 2011)
Genetics: Molecules to Populations, University of Colorado (2008, 2011)
Ecology, University of Colorado (2007)
General Biology II, University of Colorado (2007, 2012)
General Biology I, University of Colorado (2006)

STEM K-12 Education:
Teaching Evolution workshop for high school teachers, Boulder, CO (2010, 2011, 2012)
7th grade Life Science Teaching Fellow, Louisville Middle School, Louisville, CO (2009-2010)
4th grade Science Teaching Fellow, Ryan Elementary School, Lafayette, CO (2009)

Guest Lecturer:
Evolutionary Biology, University of Colorado (2011, 2012)
Genetics: Molecules to Populations, University of Colorado (2008, 2011)

POPULAR PRESS:

Eco Tones Podcast, 2016. Episode 2: Loren Cassin Sackett and Nic Kooyers. https://soundcloud.com/ecotonespodcast/episode-2-loren-cassin-sackett-and-nic-kooyers

Kiwikiu News, Maui Forest Bird Recovery Project Newsletter, 2016. Avian Research and Management. http://www.mauiforestbirds.org/Newsletters/2016_Spring.pdf

Scientific Collections International, 2014. Tracing the history of disease. http://blog.scicoll.org/2014/09/tracing-history-of-disease.html

RocketHub Crowdfunding Movement, 2013. Prairie dogs and their microbial neighbors: soil communities in burrows. Featured project. http://www.rockethub.com/projects/25189-prairie-dogs-and-their-microbial-neighbors-soil-communities-in-burrows

The Ecological Society of America, 2012. Superspreading hosts and disease hotspots. Podcast. http://www.frontiersinecology.org/beyond/?p=309

University of Colorado Science Education Initiative, 2010. Beyond Penguins and Polar Bears. Teacher and graduate students bring extreme science into K-12 curriculum. Podcast. http://beyondpenguins.nsdl.org/podcast/

Cooperative Institute for Research in the Environmental Sciences, Education and Outreach, 2010. Project Extremes: sending science graduate students into K-12 classrooms. http://issuu.com/cires/docs/education_outreach

The Antarctic Sun, 2009. Extreme Outreach: CU-Boulder grad students head to Antarctica for research and education. http://antarcticsun.usap.gov/science/contenthandler.cfm?id=1996

Boulder Daily Camera, 2009. Casey Middle School teacher, CU-Boulder graduate students headed to Antarctica. http://www.dailycamera.com/ci_13985269#axzz0iGTCBpBx

University of Colorado Graduate School 2009. Graduate student grants allow Loren Sackett to research role of disease in evolution of prairie dogs. Website feature. http://www.colorado.edu/GraduateSchool/funding/ and http://gradfeatures.colorado.edu/features/features_print.php?id=14