

ALEXANDRA L. DECANDIA

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PROFESSIONAL APPOINTMENTS

- Georgetown University, Department of Biology**, Washington, D.C. Aug. 2021-Present
Assistant Teaching Professor
Courses: Ecology + Lab (BIOL 180; Fall 2021), Foundations in Biology II Lab (BIOL 114; Spring 2022); Research Tutorial (BIOL 340; Spring 2022); Principle & Practice in Biology (BIOL 100; Summer 2022)
- Smithsonian Conservation Biology Institute**, Washington, D.C. Oct. 2021-Present
Research Associate, Center for Conservation Genomics
*Primary Research Areas: epigenetic gene regulation, microbial ecology, and wildlife conservation of black-footed ferrets (*Mustela nigripes*), Channel Island foxes (*Urocyon littoralis*), and island spotted skunks (*Spilogale gracilis amphiala*)*

POSTDOCTORAL RESEARCH

- Smithsonian Conservation Biology Institute**, Washington, D.C. Sept. 2020-Aug. 2021
Postdoctoral Research Fellow, Center for Conservation Genomics & Center for Species Survival
Advisors: Klaus-Peter Koepfli, PhD & Jesús Maldonado, PhD
I identified the primary drivers of host-associated microbial diversity in Yellowstone National Park wolves (*Canis lupus*). I additionally studied the roles of epigenetic gene regulation and microbiome diversity on mammalian health and disease in black-footed ferrets (*M. nigripes*) and Channel Island foxes (*U. littoralis*).

EDUCATION

- Princeton University Graduate School**, Princeton, NJ Sept. 2015-Aug. 2020
MA, PhD in Ecology & Evolutionary Biology
Academic Advisor: Bridgett vonHoldt, PhD
Dissertation: "An inclusive understanding of molecular variation in population genetics and wildlife disease ecology"
I argued for a more inclusive understanding of molecular diversity within ecology and evolutionary biology. In *Chapter One*, I summarized literature along the intersection of molecular ecology, disease ecology, and wildlife conservation to highlight the utility of diverse molecular techniques. In subsequent chapters, I applied multiple approaches to address questions within population genetics and wildlife disease ecology. In *Chapters Two and Three*, I examined the genetic effects of urban colonization to consider host genetic changes within altered disease landscapes. In *Chapters Four and Five*, I characterized changes in the host-associated microbiome associated with ectoparasitic mite infection to elucidate novel drivers of disease pathology.
- Columbia University, Columbia College**, New York, NY Sept. 2011-May 2015
BA in Environmental Biology, *Magna Cum Laude*, Phi Beta Kappa, Dean's List
Thesis Advisor: George Amato, PhD
Departmental Thesis: "Method for the noninvasive sex identification of order Carnivora"
2015 Winner of the Dobzhansky Award for Outstanding Thesis in Evolutionary Biology

PREVIOUS RESEARCH

- American Museum of Natural History**, New York, NY Sept. 2013-Aug. 2015
Undergraduate Research Assistant, Sackler Institute for Comparative Genomics
Advisor: George Amato, PhD
I developed the first noninvasive molecular sexing method applicable to multiple families within mammalian order Carnivora to aid conservation monitoring and management of at-risk species.
- The Earth Institute, Columbia University**, New York, NY Sept. 2012-Jan. 2013
Undergraduate Research Assistant, Arctic Arthropods Project
Advisor: Natalie Boelman, PhD
I catalogued over 23,000 terrestrial arthropods as part of larger-scale effort to examine ecological succession and altered food web dynamics in the changing Arctic.

PEER-REVIEWED PUBLICATIONS

- [11] **DeCandia, A.**, K. Cassidy, D. Stahler, E. Stahler, and B. vonHoldt (2021) Social environment and genetics underlie body site specific microbiomes of Yellowstone National Park gray wolves (*Canis lupus*). *Ecology and Evolution*. 11(14):9472-9488. <https://doi.org/10.1002/ece3.7767>
- [10] **DeCandia, A.**, E. Schrom, E. Brandell, D. Stahler, and B. vonHoldt (2021) Sarcoptic mange severity is associated with reduced genomic variation and evidence of selection in Yellowstone National Park wolves (*Canis lupus*). *Evolutionary Applications* 14(2):429-445. <https://doi.org/10.1111/eva.13127>
- Featured on Evolutionary Applications cover: <https://doi.org/10.1111/eva.13206>
- [9] vonHoldt, B.†, **A. DeCandia**†, E. Heppenheimer, I. Janowitz-Koch, R. Shi, H. Zhou, C. German, K. Brzeski, K. Cassidy, D. Stahler, and J. Sinsheimer (2020) Heritability of inter-pack aggression in a wild pedigreed population of North American gray wolves. *Molecular Ecology* 29(10):1764-1775. <https://doi.org/10.1111/mec.15349> († authors contributed equally)
- Featured on Molecular Ecology cover: <https://doi.org/10.1111/mec.14740>
 - Perspective by C. Schell: <https://doi.org/10.1111/mec.15453>
- [8] **DeCandia, A.**, L. Brenner, J. King, and B. vonHoldt (2020) Ear mite infection is associated with altered microbial communities in genetically depauperate Santa Catalina Island foxes (*Urocyon littoralis catalinae*). *Molecular Ecology* 29(8):1463-1475. <https://doi.org/10.1111/mec.15325> (preprint available: *bioRxiv* 653220)
- Perspective by B. Trevelline, J. Stephenson, and K. Kohl: <https://doi.org/10.1111/mec.15397>
- [7] **DeCandia, A.**, K. Leverett, and B. vonHoldt (2019) Of microbes and mange: Consistent changes in the skin microbiome of three canid species infected with *Sarcoptes scabiei* mites. *Parasites and Vectors* 12(1):488. <https://doi.org/10.1186/s13071-019-3724-0> (preprint available: *bioRxiv* 709436)
- [6] **DeCandia, A.**, K. Brzeski, E. Heppenheimer, C. Caro, G. Camenisch, C. Driscoll, and B. vonHoldt (2019) Urban colonization through multiple genetic lenses: The city fox phenomenon revisited. *Ecology and Evolution* 9(4):2046-2060. <https://doi.org/10.1002/ece3.4898>
- [5] **DeCandia, A.**†, C. Henger†, A. Krause, L. Gormezano, M. Weckel, C. Nagy, J. Munshi-South, and B. vonHoldt (2019) Genetics of urban colonization: Neutral and adaptive variation in coyotes (*Canis latrans*) inhabiting the New York metropolitan area. *Journal of Urban Ecology* 5(1):juz002. <https://doi.org/10.1093/jue/juz002> († authors contributed equally)
- [4] Heppenheimer, E., R. Harrigan, L. Rutledge, K. Koepfli, R. Horwath, **A. DeCandia**, K. Brzeski, J. Benson, T. Wheeldon, B. Patterson, R. Kays, P. Hohenlohe, and B. vonHoldt (2018) Population genomic analysis of North American eastern wolves (*Canis lycaon*) supports their conservation priority status. *Genes* 9(12):606. <https://doi.org/10.3390/genes9120606>
- [3] Heppenheimer, E., K. Brzeski, J. Hinton, B. Patterson, L. Rutledge, **A. DeCandia**, T. Wheeldon, S. Fain, P. Hohenlohe, R. Kays, B. White, M. Chamberlain, and B. vonHoldt (2018) High genomic diversity and candidate genes under selection associated with range expansion in eastern coyote (*Canis latrans*) populations. *Ecology and Evolution* 8(24):12641-12655. <https://doi.org/10.1002/ece3.4688>
- [2] **DeCandia, A.**, A. Dobson, and B. vonHoldt (2018) Toward an integrative molecular approach to wildlife disease. *Conservation Biology* 32(4):798-807. <https://doi.org/10.1111/cobi.13083>
- [1] **DeCandia, A.**, S. Gaughran, A. Caragiulo, and G. Amato (2016) A novel molecular method for noninvasive sex identification of order Carnivora. *Conservation Genetics Resources* 8(2):119-121. <https://doi.org/10.1007/s12686-016-0525-z>

GRANTS & FELLOWSHIPS

2021-2022: **Georgetown University Annual Research Grant**, \$10,000
2020-2021: **Smithsonian Institution Fellowship Program Postdoctoral Fellowship**, \$54,550
2015-2020: **National Science Foundation Graduate Research Fellowship**, \$138,000
2020: **Friends of the Island Fox 2020 Research Grant**, \$5,000
2019: **American Society of Mammalogists Student Travel Award**, \$500
2017: **Center for Health & Wellbeing Health Grand Challenge Research Award**, \$5,000
2017: **American Museum of Natural History Theodore Roosevelt Memorial Fund**, \$2,350

- 2017: **American Society of Mammalogists Grants-in-Aid of Research**, \$1,500
2016: **Princeton University Women Scientists in Conservation Biology Research Award**, \$7,500
2016: **Department of Ecology & Evolutionary Biology First Year Seed Money**, \$2,500
2016: **Center for Health & Wellbeing Health Grand Challenge Research Award**, \$2,000
2016: **Princeton University Graduate School Professional Development Travel Funds**, \$500

INVITED SEMINARS & GUEST LECTURES

- 2022: **Science Research Experience (REx), Princeton Day School**
Guest Lecture for High School Students, "Conservation genetics and microbiomes in Yellowstone National Park wolves"
- 2021: **Conservation Biology (BIOL 365), Georgetown University**
Guest Lecture for Undergraduates, "Modern conservation tools: Genetics"
- 2021: **Applied Molecular Ecology (EEB 331), Princeton University**
Guest Lecture for Undergraduates, "Studying the host-associated microbiome in wildlife"
- 2021: **Cross-Center Seminar, Smithsonian Conservation Biology Institute**
Invited Seminar, "Mites, microbes, and tumors: The ear canal microbiome of Santa Catalina Island foxes"
- 2021: **Ecology, Evolution & Conservation Biology Program, University of Hawai'i at Mānoa**
Invited Seminar, "Microbial dysbiosis and its implications for disease in genetically depauperate Santa Catalina Island foxes"
- 2021: **Smithsonian-Mason School of Conservation, George Mason University**
Guest Lecture for Undergraduates, "Black-footed ferrets in research: Using collections to advance conservation science and practice"
- 2021: **Alternative Career Seminar, Department of Ecology & Evolutionary Biology, Princeton University**
Invited Seminar, "Research and conservation at the Smithsonian Conservation Biology Institute"

CONFERENCE PRESENTATIONS

- 2021: **100th Annual Meeting of the American Society of Mammalogists (ASM)**
Oral Presentation, "Genomics underlie disease severity in Yellowstone National Park wolves"
- 2021: **Annual Island Fox Working Group Meeting**
Oral Presentation, "Channel Island fox microbiomes"
- 2021: **Annual Black-footed Ferret Genomics Working Group Meeting**
Oral Presentation, "Examining epigenetic & microbial variation in captive-managed black-footed ferrets"
- 2020: **The Princeton University Center for Health & Wellbeing Student Research Symposium**
Oral Presentation, "Genomic underpinnings and consequences of sarcoptic mange severity in Yellowstone National Park wolves"
- 2020: **North American Congress for Conservation Biology (NACCB)**
Oral Presentation, "Microbial dysbiosis and its implications for disease in genetically depauperate Santa Catalina Island foxes"
*Recipient of Student Presentation Award for "Best Full Length Presentation"
- 2020: **Ecological Society of America Annual Meeting (ESA)**
Oral Presentation, "Microbial dysbiosis and its implications for disease in genetically depauperate Santa Catalina Island foxes"
- 2020: **Annual Island Fox Working Group Meeting**
Oral Presentation, "The host-associated microbiome of Santa Catalina Island foxes"
- 2019: **Student Conference on Conservation Science – New York (SCCS-NY)**
Oral Presentation, "Microbial diversity and its implications for disease in an endemic fox population"
- 2019: **99th Annual Meeting of the American Society of Mammalogists (ASM)**
Oral Presentation, "Microbial diversity and its implications for disease in an endemic fox population"
- 2019: **Ecology & Evolution of Infectious Diseases (EEID)**
Poster Presentation, "Microbial diversity and its implications for disease in an endemic fox population"
- 2019: **Northeast Natural History Conference (NENHC)**
Invited Oral Presentation, "Genetics of urban coyote colonization: Neutral and adaptive variation in NYC's newest residents"

- 2019: **Columbia-Rutgers-Princeton-Penn-Yale Student Conference (CRPPY)**
Oral Presentation, "Genetics of urban colonization: Neutral and adaptive variation in urban canids"
- 2017: **Student Conference on Conservation Science – New York (SCCS-NY)**
Oral Presentation, "Genetic underpinnings of disease severity in Yellowstone National Park wolves"
 *Recipient of Award for "Best Full Length Presentation"
- 2017: **The Wildlife Society Annual Meeting (TWS)**
Oral Presentation, "Genetic underpinnings of disease severity in Yellowstone National Park wolves"
- 2017: **The Society for Molecular Biology & Evolution Annual Meeting (SMBE)**
Poster Presentation, "Genetic underpinnings of disease severity in Yellowstone National Park wolves"
- 2016: **The Princeton University Center for Health & Wellbeing Student Research Symposium**
Poster Presentation, "Genetic underpinnings of disease severity in Yellowstone National Park wolves"
- 2016: **Student Conference on Conservation Science – New York (SCCS-NY)**
Oral Presentation, "A novel molecular method for noninvasive sex identification of order Carnivora"
- 2014: **Student Conference on Conservation Science – New York (SCCS-NY)**
Poster Presentation, "A novel molecular method for noninvasive sex identification of order Carnivora"
- 2013: **The Columbia University Earth Institute Student Research Showcase**
Poster Presentation, "Arctic arthropods: seasonal change at the base of the tundra food web"

TEACHING EXPERIENCE

- 2021-Present: **Assistant Teaching Professor, Georgetown University**
 In Fall 2021, I designed and implemented an Ecology course for students in their sophomore, junior, and senior years. In Spring 2022, I am leading four lab sections for first year students in Foundations in Biology II, and mentoring three juniors and two seniors pursuing scientific research through a Research Tutorial.
- 2016-2020: **Princeton University McGraw Center for Teaching & Learning, Graduate Teaching Fellow**
 I trained first time science educators in implementing active teaching strategies, creating inclusive classrooms, and leading effective lecture, seminar, and laboratory-based undergraduate courses. I also performed classroom observations to provide real-time feedback to science educators during the semester.
- 2016-2020: **Princeton University McGraw Center for Teaching & Learning, Teaching Transcript Recipient**
 I participated in assistant in instruction (AI) orientation, served as an AI for two semesters, attended and led teaching pedagogy workshops, developed a written teaching philosophy, and designed an original syllabus.
- 2019: **Graduate Teaching Assistant for Winter Ecology Field Course (EEB521), Princeton University**
 I guided first year graduate students through design and implementation of short-term research projects in Yellowstone National Park in Wyoming, USA.
- 2015-2017: **Graduate Teaching Assistant for Evolution (EEB309), Princeton University** (two semesters)
 I led weekly discussion sections for undergraduates that included critique of primary literature, group activities (e.g., Pokémon phylogeny construction), and Jeopardy-style review to engage students with the material. I also implemented a communication project that challenged students to creatively share science with the public.

MENTORING EXPERIENCE (*student co-authors on peer-reviewed publications)

- 2022: **Laura Adeduro**, Georgetown University Research Tutorial Student '23 – *Wildlife Microbiomes*
- 2022: **Alexandra Bamford**, Georgetown University Research Tutorial Student '23 – *Wildlife Microbiomes*
- 2022: **Samantha Pasciullo Boychuck**, Georgetown University Research Tutorial Student '23 – *Wildlife Microbiomes*
- 2022: **Rachel Gaudreau**, Georgetown University Research Tutorial Student '22 – *Wildlife Microbiomes*
- 2022: **Afua Nyantakyi**, Georgetown University Research Tutorial Student '22 – *Wildlife Microbiomes*
- 2021-2022: **Elton Tran**, Princeton University Senior Thesis Student '22 – *Santa Cruz Island Skunk Microbiome*
- 2021-2022: **Emily Yu**, Princeton University Senior Thesis Student '22 – *Northern Elephant Seal Microbiome*
- 2021: **Cesar Carrasco**, UCSB-Smithsonian Scholars Program Student – *Channel Island Fox Microbiome*
- 2020-2021: **Jasmine Lu**, Princeton University Senior Thesis Student '21 – *Santa Catalina Island Fox Microbiome*
- 2019-2020: **Kennedy Leverett***, Princeton University Senior Thesis Student '20 – *Microbiome of Canid Sarcoptic Mange*
- 2018-2019: **Mikaela Walkup**, Princeton University Senior Thesis Student '19 – *Santa Catalina Island Fox Epigenetics*

2016-2017: **Catherine Caro***, Princeton University Senior Thesis Student '17 – *Red Fox Urbanization Genetics*
2016-2017: **Rohan Hylton**, Princeton University Senior Thesis Student '17 – *Santa Catalina Island Fox Genetics*
2016-2017: **Quin Pompei**, Princeton University Senior Thesis Student '17 – *Yellowstone National Park Wolf Genetics*
2016: **Amelia Krause***, High School Laboratory Learning Student – *Coyote Urbanization Genetics*
2015-2016: **Samantha Wu**, Princeton University Senior Thesis Student '16 – *Yellowstone National Park Wolf Genetics*

SCIENCE COMMUNICATION, OUTREACH, & DIVERSITY INITIATIVES

2022: **Princeton Day School, Science Research Experience Program (Rex)** (presenter)
2020-2021: **Skype a Scientist** (presenter for elementary & middle school students; 12 presentations)
2020-2021: **American Genetic Association** (blog columnist; 2 posts)
2021: **Friends of the Island Fox, “Date with a Fox” Event** (presenter)
2021: **American Society of Mammalogists One-on-One Mentoring** (mentor for undergraduate students)
2021: **Ozarks Science & Engineering Fair** (senior high division zoology judge)
2018-2020: **Princeton University Ecology & Evolutionary Biology Scholars Program** (mentor & presenter for prospective graduate students from backgrounds historically underrepresented in STEM)
2016-2020: **Princeton Alliance Church Young Adults Ministry** (member)
2015-2020: **Princeton University Women in Science Program** (member)
2020: **Princeton Alliance Church Young Adults Ministry** (servant leader)
2018: **Open Labs Science Café** (presenter for high school students)
2018: **Bring Your Kids to Work Day** (roundtable leader for elementary school students)
2017: **Princeton Alliance Church Middle School Ministry** (servant leader)
2013-2015: **Columbia Science Review** (blog columnist; 8 posts)

ACADEMIC & PROFESSIONAL SERVICE

Invited Peer Reviewer: **Conservation Genetics Resources; Ecology & Evolution; Frontiers in Ecology & Evolution; Journal of Heredity; Journal of Urban Ecology; Microbiology Spectrum; Molecular Ecology; PeerJ; PLoS ONE; Scientific Reports**

2020-Present: **Black-footed Ferret Genomics Working Group** (member)
2020-Present: **Channel Island Fox Conservation Working Group** (member)
2020-Present: **Channel Island Spotted Skunk Working Group** (member)
2020-Present: **Smithsonian Conservation Biology Institute Genomics Journal Club** (member & presenter)
2020-Present: **Smithsonian Conservation Biology Institute Microbiome Journal Club** (member & presenter)
2015-2020: **Princeton University Evolution Group** (organizer, member, & presenter)
2015-2020: **Princeton University Disease Group** (member & presenter)
2017-2019: **The Wildlife Society Molecular Ecology Working Group** (student board member)
2013-2015: **Columbia University Environmental Biology Society** (founder & executive board member)

WORKSHOPS

2018: **Bridging Theory & Experiment in Microbial Communities**
2016: **Evolutionary Biology in Guarda, Switzerland**
2016: **Recent Advances in Conservation Genetics (ConGen) in Tihany, Hungary**
2009: **The Green Schools Alliance Student Climate & Conservation Congress (SC3)**

FIELD EXPERIENCE

2019: **Catalina Island Conservancy Fox Trapping, Santa Catalina Island (California, USA)**
I shadowed annual island fox monitoring efforts to observe and aid microbiome sample collection.

2019: **Winter Ecology Field Course, Yellowstone National Park (Wyoming, USA)**
I guided first year graduate students through design and implementation of short-term research projects on lichen growth and animal traffic patterns in different microclimates.

2016: **Tropical Ecology Field Course, Tiputini Biodiversity Station (Ecuador)**
I designed and implemented a short-term research project on ant-plant mutualisms in “devil’s gardens” in the Amazon rainforest.

2015: **Coral Reef Ecology Field Course, Bermuda Institute of Ocean Sciences (Bermuda)**

I learned how to identify local species of coral, fish, and terrestrial vertebrates through classroom, snorkeling, and hiking experiences.

MEDIA COVERAGE

2021: “Fox Foto Friday – This is Island Fox Science” (Friends of the Island Fox)

2021: “Fox Foto Friday – Island Fox Science in Progress” (Friends of the Island Fox)

2021: “Fox Foto Friday – Island Foxes in Washington, D.C.?” (Friends of the Island Fox)

2021: “Yellowstone's wolves are fighting mange at the genetic level” (Wyoming Public Radio)

2021: “Genetics study shows why some Yellowstone wolves dodge mange” (Billings Gazette)

2021: “Study of mange in Yellowstone wolves could inform conservation efforts, scabies research” (Bozeman Daily Chronicle)

2021: “Mange in Yellowstone wolves reveals insights into human scabies and conservation biology” (Princeton University)

2021: “Fox Foto Friday – Island Foxes Healthy Inside and Out” (Friends of the Island Fox)

2020: “FIF Research Grant to Investigate Diversity of Island Fox Microbiome” (Friends of the Island Fox)

2020: “Mites, microbes, and cancer in Santa Catalina Island foxes” (Friends of the Island Fox)

2020: “Microbes linked to cancer in threatened California foxes, report Princeton researchers” (Princeton University)

2020: “Are coyotes moving into your neighborhood?” (Science News for Students)

2019: “What can the ears of island foxes tell us?” (Forbes)

2019: “The city fox phenomenon” (Ecology and Evolution Blog)

2018: “Montreal turns to coyote hazing after 19 people are bitten” (New York Times)

PROFESSIONAL MEMBERSHIPS

2021-Present: **Association of Minority Zoo & Aquarium Professionals**

2017-Present: **American Genetic Association**

2017-Present: **American Society of Mammalogists**

2017-Present: **Society for Conservation Biology**

2017-Present: **The Wildlife Society**

2017-2018: **Society for the Study of Evolution**

2017: **American Civil Liberties Union**

2017: **American Society of Naturalists**

2017: **Society for Molecular Biology & Evolution**

2015: **Phi Beta Kappa Society**