

GITANJALI E. GNANADESIKAN

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EDUCATION

University of Arizona

August 2017 - Present

PhD Candidate in Biological Anthropology
Minor in Cognitive Science
University Fellow, NSF Graduate Research Fellow, PEO Scholar
Advisor: Evan L. MacLean
GPA: 4.0

University of Arizona

May 10, 2019

MA in Anthropology
Report: *Estimating the Heritability of Cognitive Traits Across Dog Breeds Reveals a Heritable Cooperative-Communicative Factor.*
Advisor: Evan L. MacLean
GPA: 4.0

Princeton University

June 3, 2014

AB in Ecology and Evolutionary Biology, *magna cum laude.*
Thesis: *Exploring the Canine Methylome: The Impacts of Domestication of the Regulatory Genome.*
Advisor: Bridgett M. vonHoldt
GPA: 3.72

PEER-REVIEWED PUBLICATIONS

- Gnanadesikan, Gitanjali E.**, Brian Hare, Noah Snyder-Mackler, Josep Call, Julianne Kaminski, Ádám Miklósi & Evan MacLean (2020). Breed differences in dog cognition associated with brain-expressed genes and neurological functions. *Integrative and Comparative Biology*. doi: 10.1093/icb/icaa112
- Bray, Emily E., Margaret E. Gruen, **Gitanjali E. Gnanadesikan**, Daniel J. Horschler, Kerinne M. Levy, Brenda S. Kennedy, Brian A. Hare & Evan L. MacLean (2020). Cognitive characteristics of 8-to-10-week-old assistance dog puppies. *Animal Behaviour*, 166, 193-206. doi:10.1016/j.anbehav.2020.05.019.
- Gnanadesikan, Gitanjali E.**, Brian Hare, Noah Snyder-Mackler & Evan L. MacLean (2020). Estimating the Heritability of Cognitive Traits Across Dog Breeds Reveals Highly Heritable Inhibitory Control and Communication Factors. *Animal Cognition*. doi: 10.1007/s10071-020-01400-4
- Gnanadesikan, Gitanjali E.**, William D. Pearse & Allison K. Shaw (2017). Evolution of mammalian migrations for refuge, breeding, and food. *Ecology and Evolution*, 7(15), 58915900. doi: 10.1002/ece3.3120

Janowitz, Ilana L., Michelle M. Creek, Michael J. Thompson, Kerry A. Deere-Machemer, Jun Wang, Lionel Duarte, **Gitanjali E. Gnanadesikan**, Eskender L. McCoy, Liudmilla Rubbi, Daniel R. Stahler, Matteo Pellegrini, Elaine A. Ostrander, Robert K. Wayne, Janet S. Sinsheimer & Bridgett M. vonHoldt (2016). The concerted impact of domestication and transposon insertions on methylation patterns between dogs and grey wolves. *Molecular Ecology*, 25(8), 18381855.
doi:10.1111/mec.13480

SUBMITTED MANUSCRIPTS

Bray, Emily E., Margaret E. Gruen, **Gitanjali E. Gnanadesikan**, Daniel J. Horschler, Kerinne M. Levy, Brenda S. Kennedy, Brian A. Hare & Evan L. MacLean. Dog cognitive development: A longitudinal study across the first two years of life.

OTHER PUBLICATIONS

Gnanadesikan, Gitanjali E. (2014) Exploring the Canine Methylome: The Impacts of Domestication of the Regulatory Genome. Thesis (Senior)-Princeton University, 2015. <http://arks.princeton.edu/ark:/88435/dsp011544bp26d>

Gnanadesikan, Gitanjali E. (2012) Identifying PRDM9 binding sites in meiotic recombination hotspots." *Summer and Academic Year Student Reports*. Paper 2371. <http://mouseion.jax.org/strp/2371>

CONFERENCE PRESENTATIONS

Gnanadesikan, Gitanjali E., Brian Hare, Noah Snyder-Mackler & Evan L. MacLean. *Exploring the Genetic Bases of Breed Differences in Dog Cognition*. Presented at the East Coast Workshop on Canine Cognition. February 15 - 16, 2020.

MacLean, Evan L., Emily E. Bray, **Gitanjali E. Gnanadesikan** & Daniel J. Horschler. *Associations between individual differences in cognition and training outcomes in assistance dogs*. Presented by Evan MacLean at the East Coast Workshop on Canine Cognition. February 15 - 16, 2020.

Bray, Emily E., **Gitanjali E. Gnanadesikan**, Daniel J. Horschler & Evan L. MacLean. Early development and longitudinal stability of cognitive traits in working dogs. Presented by Emily Bray at the East Coast Workshop on Canine Cognition. February 15 - 16, 2020.

MacLean, Evan L., **Gitanjali E. Gnanadesikan**, Emily E. Bray & Noah Snyder-Mackler. *Dog Diversity as a Natural Experiment in Cognitive Evolution*. Presented by Evan MacLean at the Society for Integrative and Comparative Biology Annual Meeting. January 3 - 7, 2020.

Gnanadesikan, Gitanjali E., Brian Hare, Noah Snyder-Mackler, and Evan L. MacLean. *Estimating the Heritability of Cognitive Traits Across Dog Breeds*. Presented at the University of Arizona - Arizona State University Cognitive Science Conclave. December 7, 2019.

Gnanadesikan, Gitanjali E., Brian Hare, Noah Snyder-Mackler, and Evan L. MacLean. *Estimating the Heritability of Cognitive Traits Across Dog Breeds Reveals Highly Heritable Inhibitory Control and Cooperative-Communicative Factors*. Presented at the Southwestern Association of Biological Anthropologists Annual Meeting. November 1-2, 2019.

Gnanadesikan, Gitanjali E., Brian Hare, Noah Snyder-Mackler, Evan L. MacLean. *Estimating the Heritability of Cognitive Traits Across Dog Breeds Reveals a Heritable Cooperative-Communicative Factor*. Presented at the International Canine Science Conference. October 18 - 20, 2019.

MacLean, Evan L., Emily E. Bray, **Gitanjali E. Gnanadesikan** & Daniel J. Horschler. *Ontogeny and heritability of cognitive and temperamental traits in an assistance dog population*. Presented by Evan MacLean at the International Canine Science Conference, October 18 - 20, 2019.

Gnanadesikan, Gitanjali E., Brian Hare & Evan L. MacLean. *Estimating the Heritability of Cognitive Traits Across Dog Breeds*. Presented at the 26th International Comparative Cognition Conference. April 10 - 14, 2019.

Bray, Emily E., **Gitanjali E. Gnanadesikan**, Daniel J. Horschler & Evan L. MacLean. *Early emerging cognition in 9-week-old puppies*. Presented by Emily Bray at the 26th International Conference on Comparative Cognition. April 10 - 14, 2019.

MacLean, Evan L., Emily E. Bray, **Gitanjali E. Gnanadesikan**, Daniel J. Horschler. *Heritability of cognitive traits in a pedigreed dog population*. Presented by Evan MacLean at the 26th International Conference on Comparative Cognition. April 10 - 14, 2019.

Gnanadesikan, Gitanjali E., Daniel J. Horschler & Evan L. MacLean. *Social Cues and Hormonal Profiles Over Development in Wolf Puppies*. Poster presented at the Graduate and Professional Student Council Research Showcase. February 13, 2019.

Gnanadesikan, Gitanjali E. & Evan L. MacLean, *Estimating the Heritability of Cognitive Traits*. Presented at the East Coast Workshop on Canine Cognition. November 10 - 11, 2018.

Gnanadesikan, Gitanjali E. & Bridgett M. vonHoldt. *Exploring the Canine Methylome: The Impact of Domestication on the Regulatory Genome*. Poster presented at the annual meeting for the Society for Integrative and Comparative Biology. January 3-7, 2014

HONORS, AWARDS, AND GRANTS

- 2020 - 2021 PEO Scholar Award.
- 2019 Graduate College Travel Grant.
- 2018 - 2023 NSF Graduate Research Fellowship.
- 2018 University Fellows Professional Development Award
- 2018 School of Anthropology Summer Award: Traditions, Transitions, and Treasures Fund.
- 2018 Graduate and Professional Student Council Research and Project Grant.
- 2018 Graduate and Professional Student Council Travel Grant.
- 2017 - 2018 University Fellow - University of Arizona first-year fellowship.
- 2017 NSF GRFP Honorable Mention.
- 2014 - 2015 Teaching Fellow - Teach for China.
- 2014 Elected to the Sigma Xi scientific honors society.
- 2014 Charlotte Magnum Student Support Award from the Society for Integrative and Comparative Biology.
- 2014 Porter '52 EEB Research Fund conference award to present thesis work.
- 2013 Princeton Ecology and Evolutionary Biology department grant to attend the International Canine and Feline Genomics conference.

- 2013 John T. Bonner Senior Thesis Fund grant for summer thesis work.
- 2012 Research Experience for Undergraduates summer program at Jackson Laboratory.

RESEARCH EXPERIENCE

Endocrine Assays August 2017 - Present
Graduate Student, Research Assistant Tucson, AZ

- Developing, validating, and performing protocols for assaying oxytocin, vasopressin, and cortisol in a variety of biological samples using ELISA.
- Species studied include canines, humans, mice, and sifaka.

Fieldwork with Captive Wolf Pups May - July 2018
Graduate Student Wildlife Science Center, MN

- Socialized, conducted behavioral and cognitive tests on, and collected biological samples from captive wolf puppies.

Canine Cognition August 2016 - August 2017
Laboratory Coordinator Tucson, AZ

- Collaborated with multiple institutions to develop a battery of cognitive tests to use on puppies.
- Conducted cognitive behavioral experiments with companion dogs in the Tucson area at the Arizona Canine Cognition Center (ACCC) and puppies at Canine Companions for Independence.

Senior Thesis Research Summer 2013 - Spring 2014
Student Princeton, New Jersey

- “Exploring the Canine Methylome: The Impacts of Domestication on the Regulatory Genome”
- Conducted computational analysis of genome-wide methylation data with the aim of discovering differences in genetic regulation between dogs and wolves.

Coyote Sample Collection February 2014
Research Assistant Tunkhannock, Pennsylvania

- Collected morphological data and tongue samples for DNA sequencing from coyotes killed by hunters.

Field Courses Spring 2013
Student Smithsonian Tropical Research Institute, Panama

- Tropical Ecology, Biology of Coral Reefs, Ecology and Epidemiology of Parasites and Infectious Diseases, Pre-Columbian Peoples of Tropical America and Their Environments.

The Jackson Laboratory Summer 2012
Summer Student Bar Harbor, Maine

- Worked in a molecular biology laboratory on a project to identify the binding sites of PRDM9, a zinc-finger protein involved in meiotic recombination.

Princeton Ecology and Evolutionary Biology Department Summer 2011
Princeton Environmental Institute Intern Princeton, New Jersey

- Compiled a database of mammals including the presence or absence of migratory behaviors and related factors and analyzed the database for patterns regarding motivations for migration, geographic distribution, and spatial patterns.

TEACHING AND MENTORING EXPERIENCE

- 2020 Guest lecturer for the New Start Summer Program for incoming students.
- 2020 Mentoring a first-generation/low-income Princeton undergraduate.
- 2020 Mentoring an undergraduate honors thesis student in the ACCC.
- 2019 Teaching assistant in biological anthropology for Animal Minds (ANTH 170C2).
- 2019 - 2020 Peer editor for University of Arizona's Fellowship Application Support Program.
- 2018 - 2019 Mentored a first-year graduate student in the University Fellows Program.
- 2017 - 2018 Mentored a high school student from the Arizona MESA program.
- 2016 - 2017 Trained undergraduates for research activities at the ACCC.
- 2016 Tutored and mentored elementary school students in Baltimore.
- 2014 - 2015 Taught English and music to third and fifth graders in rural China.
- 2011 - 2013 Student mentor for Princeton University's Integrated Science Curriculum.

SCIENTIFIC OUTREACH

- 2019 - 2020 Science Olympiad: weekly volunteer at Mansfield Middle School in Tucson.
- 2017 - 2018 Arizona MESA: weekly volunteer with a science club at Flowing Wells High School.
- 2017 Dog Days with the Dean: experimental demonstration for undergraduate students.
- 2017 Office of Admissions: experimental demonstration for AP high school students.

ACADEMIC SERVICE

- 2020 - Organizer for the bioanthropology journal club.
- 2020 - Vice president for the Anthropology Graduate Students at the University of Arizona.
- 2019 - Student representative on the Anthropology Department's Curriculum Committee.
- 2015 - Princeton alumni interviewer.
- 2019 - 2020 Secretary for the Anthropology Graduate Students at the University of Arizona.
- 2018 - 2020 Organizer for the Arizona Canine Cognition Lab's journal club.
- 2018 - 2019 Travel and research grant judge for the Graduate and Professional Student Council.
- 2010 - 2011 Co-founder of and historian for the Women in Science Colloquium at Princeton.

AD HOC REVIEWER

Animal Cognition

SELECTED MEDIA COVERAGE

“What a Crowdsourced Study Taught Us About How Dogs Learn.” *Smithsonian Magazine*.

<https://www.smithsonianmag.com/science-nature/how-much-dogs-intelligence-hereditary-180975448>

“What separates dogs and wolves? Researchers journey to Anoka County to find out.” *Minnesota Star Tribune*. <http://www.startribune.com/what-separates-dogs-and-wolves-researchers-journey-to-anoka-county-to-find-out/488199251/>

TECHNICAL STRENGTHS

Languages:	English (native), Mandarin (moderate fluency and literacy)
Computer Languages:	R, Python
Also familiar with:	Arduino, C++, ArcGIS, Java, MATLAB, HTML
Other tools:	LaTeX, Emacs, ImageJ, High Performance Computing
Certifications:	TESOL