

# ELIZABETH TAPANES, PH.D.

*NSF Post-doctoral Fellow*

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## RESEARCH PROGRAM

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**My research program is focused on characterizing the maintenance and origins of biodiversity with the goals of (1) understanding adaptive capacity and (2) protecting wild populations.** I use various 'tools' such as genomics, morphological sampling, ecological modeling, and bioinformatics. My previous work has focused on the biology of pigmentation, while most of my current work is on the ecology and genomics of adaptation. I study threatened taxa (such as endangered lemurs), as well as non-threatened threespine stickleback. The latter is integral to the former so I may build predictive models of when organisms will adapt and when they may need genetic rescue. My future research will continue to address basic science questions to characterize biodiversity and will also prioritize applied science to address the joint looming crises of biodiversity collapse and climate change.

## CURRENT POSITION

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2021-Present **Post-doctoral Fellow**, Division of Ecology, Behavior & Evolution,  
University of California San Diego

## EDUCATION

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|------|---|
| 2021 | <b>Ph.D.</b> , Human Paleobiology, The George Washington University<br><i>Dissertation Research: "The Impact of Ecology, Demography, and Genetics on Primate Pelage."</i> |
| 2019 | <b>M.Phil.</b> , Human Paleobiology, The George Washington University   |
| 2016 | <b>M.A.</b> , Anthropology, Florida Atlantic University   |
| 2012 | <b>B.S.</b> , Biological Sciences, Florida International University   |

## PEER-REVIEWED MANUSCRIPTS OR BOOK CHAPTERS

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#Students supervised

7. **Tapanes, E.**, Kamilar, J.M., Nukala, M. #, Irwin, M.T., & Bradley, B.J. (*In press*).  
Melanism in a wild sifaka population: Darker where cold and fragmented. *International Journal of Primatology*.

6. **Tapanes, E.,** Jacobs, R.L., Harryman, I. #, Louis Jr., E.E., Irwin, M.T., Kamilar, J.M., & Bradley, B.J. (2022). Hair phenotype diversity across Indriidae lemurs. *American Journal of Biological Anthropology*, 178(2): 257-272.
5. **Tapanes, E.,** J. M. Kamilar, & Bradley, B.J. (2021). Molecular and cellular processes underlying hair pigmentation and growth in primate evolution. *In: Evolutionary Cell Processes in Primates: Genes, Skin, Energetics, Breathing, and Feeding; Volume II.* Pitirri, M.K., & Richtsmeier, J.T. (Eds.) CRC Press.
4. **Tapanes, E.,** T., Anestis, S., Kamilar, J.M., & Bradley, B.J. (2020). Does hair greying in chimpanzees provide a salient progressive cue of ageing? *PLOS ONE*, 15(7): e0235610.
3. Wolovich, C.K., **Tapanes, E.,** & Evans, S. (2017). Allogrooming in male-female pairs of captive owl monkeys (*Aotus nancymae*). *Folia Primatologica*, 88(6), 483-496.
2. **Tapanes, E.,** Cords, M., & Detwiler, K.M. (2016). Predation on bats by *Cercopithecus* monkeys: Implications for zoonotic disease transmission. *EcoHealth*, 13(2), 405-409.
1. Jefferson, J.P., **Tapanes, E.,** & Evans, S. (2014). Owl monkeys (*Aotus* spp.) socially anoint in captivity. *Folia Primatologica*, 85(2), 119-134.

#### RESEARCH GRANTS

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|------|---|
| 2022 | <b>NSF Post-doctoral Fellowship in Biology</b> (\$138,000; PI). “Evolutionary genomics of rapid adaptation in wild threespine stickleback ( <i>Gasterosteus aculeatus</i> )”  |
| 2019 | <b>Leakey Foundation</b> (\$15,000; PI). “Hair evolution in a comparative context”  |
| 2018 | <b>Lewis N. Cotlow Award, The George Washington University</b> (\$1,800.00; PI)<br>“Evolution of the ‘naked ape’: hair evolution in a comparative framework”  |
| 2018 | <b>William Warren Graduate Research Grant, The George Washington University</b> (\$800.00; PI) “Evolution of the ‘naked ape’: hair evolution in a comparative framework”  |
| 2017 | <b>International Primatological Society</b> (\$1,500.00; PI). “Diversity of pelage patterning and function in wild sifaka lemurs ( <i>Propithecus diadema</i> ) at the Tsinjoarivo Forest in Madagascar”                                    |
| 2017 | <b>Lewis N. Cotlow Award, The George Washington University</b> (\$1,800.00; PI).<br>“Diversity of pelage patterning and function in wild sifaka lemurs ( <i>Propithecus diadema</i> ) at the Tsinjoarivo forest in Madagascar” (\$1,800.00) |
| 2016 | <b>Provost Diversity Fellowship, The George Washington University</b> (≈\$25,000/year   |

for five years; \$125,000)

- 2014 **Technology Fee Grant, Florida Atlantic University** (\$4,840.00; co-I). “Using modern technology to monitor and study wild primate populations”
- 2015 **Graduate Research and Inquiry Program**, Florida Atlantic University (\$480; PI). “Coat color variation within and between red-tailed monkeys (*Cercopithecus ascanius*), blue monkeys (*C. mitis*), and hybrids (*C. ascanius x C. mitis*).”
- 2013 **Sigma Xi Grants-in-Aid of Research** (\$1,000.00; PI). “A study of female mate-recognition in a social group of red-tailed monkeys (*Cercopithecus ascanius*), blue monkeys (*C. mitis*), and hybrids at Gombe National Park”

#### **OTHER AWARDS AND FUNDING**

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- 2021 **Best Student Presentation Award, jointly awarded by American Association of Biological Anthropology and Journal of Human Evolution.** For podium presentation titled: “Ecology and opsin variation underscore the evolution of hair phenotypes across Indriidae lemurs—implications for human evolution.” (Published proceedings)
- 2021 **Best Student Presentation, Northeast Evolutionary Primatologists Conference.** For podium presentation titled: “Ecology and opsin variation underscore the evolution of hair phenotypes across Indriidae lemurs—implications for human evolution.” (Unpublished proceedings)
- 2021 **Two-year Membership Award, Society for the Study of Evolution (SSE).**
- 2020 **Summer Institute for Statistical Genetics Scholarship, University of Washington.** For attendance across three workshops: (1) Endangered Populations & Non-model Organisms, (2) Population Genetics, & (3) Quantitative Genetics
- 2018 **Student Travel Award, American Association of Anthropological Genetics.** For attendance in the Applied Genomics in Anthropological Research (AGAR) Workshop.

#### **CONFERENCE PRESENTATIONS (PUBLISHED ABSTRACTS OR MATERIALS) \* INDICATES PODIUM**

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- Tapanes, E. \***, Lasisi, T., Kamilar, J.M., & Bradley, B.J. (2022). Genomics and cellular biology of primate pigmentation: Lessons from other taxa. Invited symposium—Integumentary Anthropology: Examining the Exterior. *American Journal of Biological Anthropology*.
- Tapanes, E. \***, Jacobs, R.L., Harryman, I. \*, Louis Jr., E.E., Irwin, M.T., Kamilar, J.M., & Bradley, B.J. (2021). Ecology and opsin variation underscore the evolution of hair phenotypes across Indriidae lemurs—implications for human evolution. *American Journal of Biological Anthropology* 174(S71). *Winner of the joint American Journal of Physical Anthropology & Journal of Human Evolution Best Student Presentation Award.*

**Tapanes, E.,** Irwin, M.T., Spriggs, A.N., Kamilar, J.M., & Bradley, B.J. (2017). Subtle sexual dichromatism and dimorphism detected in wild *Propithecus diadema*. *American Journal of Physical Anthropology*. 165(S64).

Bradley, B.J., Kamilar, J.M., Spriggs, A.N., **Tapanes, E.,** Wilhelm, B.C., & Walsh, S. (2017). Pigmentation in a comparative context: Factors shaping variation and convergence in primate pelage patterns. *American Journal of Physical Anthropology* 165(S64). Poster.

**Tapanes, E. \***, & Evans, S. (2015). The significance of allogrooming to pair-bonded owl monkeys (*Aotus* spp.). *American Journal of Physical Anthropology* 160(S60). Poster.

Jefferson, J.P., **Tapanes, E.,** & Evans, S. (2012). Owl monkeys (*Aotus* spp.) socially anoint. *American Journal of Primatology* 74(S1).

**Tapanes, E.,** Wolovich, C.K., & Evans, S. (2007). Leaping into the night: when owl monkeys (*Aotus* spp.) awake. *American Journal of Primatology* 72(S1).

#### **OTHER SELECTED CONFERENCE PRESENTATIONS**

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**Tapanes, E. \***, Kamilar, J.M., Nukala, M. \*, Irwin, M.T., & Bradley, B.J. (2021). Ecological and social factors underlying pelage pigmentation in a wild sifaka (*Propithecus diadema*) population. *American Society of Naturalists*.

**Tapanes, E. \***, Jacobs, R.L., Harryman, I. \*, Louis Jr., E.E., Irwin, M.T., Kamilar, J.M., & Bradley, B.J. (2020). Ecology and opsin variation underscore the evolution of hair phenotypes across Indriidae lemurs – implications for human evolution. *Northeastern Evolutionary Primatologists*.

**Tapanes, E.,** Kamilar, J.M., Irwin, M.T., Mundy, N.I., & Bradley, B.J. (Accepted). Understanding convergent phenotypes in mammalian pelage: insights from natural primate populations. *Genetics Society of America*. Accepted. \*\*not presented due to COVID19\*\*

**Tapanes, E. \***, Irwin, M.T., Kamilar, J.M., & Bradley, B.J. (2019). Evolution of pelage in a wild lemur population. *Northeastern Evolutionary Primatologists*.

**Tapanes, E. \***, Kamilar, J.M., & Bradley, B.J. (2019). Pigmentation changes are (sort of) related to ageing in chimpanzees. *American Society of Mammalogists*.

**Tapanes, E. \***, & Detwiler, K.M. (2016). Phenotypic diversity and mating in Gombe National Park's *Cercopithecus* hybrid zone: implications for conservation. *International Primatological Society*.

Wolovich, C.K., **Tapanes, E.,** & Evans, S. (2016). Patterns of allogrooming in male-female pairs of captive owl monkeys (*Aotus nancymae*). *International Primatological Society*. Podium.

**Tapanes, E. \***, & Detwiler, K.M. (2015). Testing methods for studying color objectively in wild arboreal

primates. *South Florida Primatology*. Podium.

## **TEACHING**

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### **Instructor of Record**

2019 Summer Introduction to Biological Anthropology, The George Washington University

### **Graduate Teaching Assistant**

2018 Spring Introduction to Biological Anthropology, The George Washington University

2017 Fall Your Place in Nature, The George Washington University

2017 Spring Biological Basis of Human Behavior, The George Washington University

2016 Fall Introduction to Biological Anthropology, The George Washington University

2016 Spring Philosophy, Florida Atlantic University

2015 Fall Introduction to Anthropology, Florida Atlantic University

2015 Spring Philosophy, Florida Atlantic University

2014 Spring Introduction to Biological Anthropology, Florida Atlantic University

2013 Fall Introduction to Biological Anthropology, Florida Atlantic University

### **Other Teaching Experience**

2021 Summer Science Curriculum Specialist, John Hopkins University's Center for Talented Youth

2016 Summer Instructor, Primate Biology, Duke University's Talent Identification Program

2012 Summer Teaching Assistant, Primate Biology, Duke University's Talent Identification Program

### **Guest Lectures**

2019 Fall Great Ape Behavior and Evolution, The George Washington University, "Genetic Basis of Evolutionary Change"

## **INVITED TALKS**

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2021 San Diego Zoo Wildlife Alliance, Conservation Genetics Department  
"Evolution of phenotypic diversity in wild vertebrates"

2019 Penn State University, Department of Anthropology  
"The evolution of primate pelage: from genome to phenome"

2019 The George Washington University, Department of Biology

“The evolution of mammalian pelage: from genome to phenome”

2019 The George Washington University, Great Ape Behavior and Evolution Class  
“The genetic basis of evolutionary change”

#### **MENTORING AND TRAINING EXPERIENCE**

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##### **Ongoing**

2021-Pres. Vishwa Pandya, BS student, University of California San Diego  
Project: “*Genomic basis of divergent pigment patterns in threespine stickleback*”

2021-Pres. Brandon Tsai, BS/MS student, University of California San Diego  
Project: “*Characterizing evolutionary divergence in threespine stickleback*”

##### **Previous**

2021 WarrenKevin Henderson, MS student, The George Washington University  
Project: “*Examining convergence in equids and ursids to understand potential hominin adaptiveness to the cold*”  
Current position: Ph.D. candidate at Boston University, Anthropology

2019-2021 Alejandra Paredes Marin, BS student, The George Washington University  
Current position: Research Associate, Mount Sinai

2018-2019 Ian Harryman, post-MS student, The George Washington University  
Project: “*Hair diversity across Indriidae lemurs*”  
Current position: Ph.D. student, Stanford University, Earth System Science

2017-2019 Maanas Nukala, BS student, The George Washington University  
Project: “*Ecological niche modeling of the Critically Endangered diademed sifaka (Propithecus diadema)*”  
Current position: Data Specialist, World Resources Institute

2016-2017 Lauren Anderson, BS student, The George Washington University  
Project: “*Opsin gene variation in wild sifaka lemurs*”  
Current position: Ph.D. student, Rockefeller University, Molecular Biology

#### **MOST RELEVANT COURSEWORK TAKEN IN THE LIFE SCIENCES**

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Credit based graduate-level courses: Methods in Molecular Anthropology; Anthropological Genetics; Topics in Behavioral Ecology; Analytical Methods [using R]; Color Evolution Readings; Photographic Methods in Field Primatology; Public Understanding of Science Internship; Laboratory rotation in RNA-seq and Exome-seq in the lab of Dr. Anelia Horvath at The George Washington University

Non-credit graduate-level courses (certificate based): [Genetics of] Endangered Populations & Non-model Organisms (University of Washington, Summer Institute of Statistical Genetics); Population Genetics (University of Washington, Summer Institute of Statistical Genetics); Quantitative Genetics

(University of Washington, Summer Institute of Statistical Genetics); Python Data Structures (Coursera); Python for Everybody (Coursera)

Workshops: De Novo Genome Assembly Workshop (American Society of Mammologists), Applied Genomics in Anthropological Research (American Association of Anthropological Genetics), Introduction to Genomics & Bioinformatics (University of Maryland, Institute for Genome Sciences)

Credit based undergraduate-level courses: General Biology I & associated laboratory; General Biology II & laboratory; Ecology; Global Environment & Society; Evolution; Immunology; Genetics & associated laboratory; Cell Biology & associated laboratory; Earth Ethics; Conservation Biology; Ecology of South Florida; Animal Physiology; Histology & associated laboratory; Great Ape Conservation; Primate Biology

## **OUTREACH EXPERIENCE**

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### **Invited Outreach Activities**

- 2019 *Scientist-Is-In: Evolution of hair*, Smithsonian Natural History Museum
- 2019 *Build A Lemur*, Smithsonian Natural History Museum
- 2018 *Scientist-Is-In: Evolution of Hair*, Smithsonian Natural History Museum
- 2017 *Scientist-Is-In: Evolution of Hair*, Smithsonian Natural History Museum
- 2018 *NSF Funded Projects in Human Evolution*, USA Science and Engineering Festival in Washington, D.C.
- 2017 *World Lemur Festival*, Yale Peabody Museum of Natural History

### **Other Outreach Activities**

- 2019 – 2020 *Bi-lingual outreach* on evolutionary biology, Wheeler Road Elementary, MD
- 2019 *Lives of Scientists* (virtual), Shutesbury Elementary School, MA
- 2019 *Development of an NGSS 3<sup>rd</sup>-5<sup>th</sup> grade lesson plan* aimed to teach concepts in biological diversity, co-led with Christine Ramirez at Discovery
- 2019 *Skype-A-Scientist*, Shutesbury Elementary School (MA)
- 2018 *Panelist for 'What's Your 'Ology?'*, STEM for Her
- 2016 *Volunteer for 'BePolished' Educational Visit* to GWU Science facilities

## **PROFESSIONAL SERVICE**

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### **Peer Review**

*7 reviews total:* Scientific Reports, Ecology & Evolution, Evolutionary Anthropology, Data in Brief, African Journal of Ecology

### **Other Service**

- 2016 – 2021 Student Representative, Curriculum Committee for the Human Paleobiology Graduate Program, The George Washington University
- 2019 Student Liaison, Conservation Earth Day Symposium, The George Washington University. Cancelled due to Covid19.

2019 – 2021 Peer Advocate, Anthropology Department, The George Washington University

2016 – 2019 Committee Member, Diversity in Science (DIS) group in the Human Paleobiology Program, The George Washington University

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**NON-ENGLISH LANGUAGES SPOKEN**

Spanish (native/bilingual), Malagasy (elementary), Swahili (elementary)

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**REFERENCES**

**Diana J. Rennison, Ph.D.**

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**Brenda J. Bradley, Ph.D.**

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The George Washington University  
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**Timothy H. Webster, Ph.D.**

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**Jason M. Kamilar, Ph.D.**

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