

Francisco X. Castellanos

GENETICIST · MS · PHD STUDENT

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Summary

I have +6 years of experience in the study of evolutionary genetics, and movement ecology. I have specialized in genomics and currently applying machine learning to modernize phylogenetic analyses as a way to resolve intricate evolutionary histories. My research encompasses studies from the evolution of transposable elements to the ecology, behavior and habitat occupancy of large mammals including Andean bears, foxes and tapirs in Ecuador.

Education

Texas Tech University

Lubbock, USA

PHD STUDENT IN BIOLOGY

Jan. 2024 – Present

- Dissertation Title: From SINEs to Chromosomes: Integrating Genomic, Molecular, and Cytological Methods to Unravel Phylogenetic Discrepancies in Bats.

Texas Tech University

Lubbock, USA

MASTER OF SCIENCE IN BIOLOGY

Dec. 2023

- Thesis: A Comparative Genomics Approach to Unravel the Evolutionary Dynamics of Transposable Elements and Innate Immune Genes in Chiroptera.

Universidad Nacional de Misiones

Posadas, Argentina

B.S. IN GENETICS

Nov. 2020

- Thesis: Cytogenetic and molecular studies in some species of the genus *Myotis* (Chiroptera: Vespertilionidae: Myotinae) in Northern Argentina

Skills

Lab skills C- and G-banding, NOR, DAPI/CMA₃, FISH, PCR

Programming R, Bash, Python, LaTeX, Julia

Languages Spanish (native), English (fluent), French (A1)

Research Experience

The Ray Lab (2021 - Present)

Lubbock, USA

COLLABORATOR

- Ecuadorian bats: A key to investigating aging and metabolic trade-offs based on feeding habits and transposable element evolution
- Bat1K: An international effort to sequence and assemble the genomes of every extant bat species.
- RAPID: Immunological adaptations in bats to moderate the effect of coronavirus infection.
- RoL: FELS: EAGER: Collaborative Research: Genomics of exceptions to scaling of longevity to body size.

Instituto Nacional de Biodiversidad (2020 - Present)

Quito, Ecuador

ASSOCIATED RESEARCHER

- Employed novel bioinformatic methods to understand how mammals make use of their natural habitat and what resources impact on how they move across their home ranges.
- Used multivariate analysis methods and machine learning to assess discrimination levels among rodent taxa.

Fundación Oso Andino (2020 - Present)

Quito, Ecuador

SCIENTIFIC DIRECTOR

- As part of the Large Mammals Project in Parque Nacional Cayambe Coca, I assisted in ecotourism projects and tracking of mammals.
- We work with INABIO on several projects related to home range estimation of mammals habitats and behavior patterns using GPS data.
- We have teamed up with colombian institutions to study how Andean bears select their environments and assess environmental diet preferences.

Professional Experience

Bat1K

REGIONAL CHAIR

Jun. 2023 – Present

- I bridge connections between one of the most important worldwide bat consortia and institutions in Ecuador to make them part of cutting-edge genome research.
- These efforts are expanding the consortium's reach to local students and professionals.

Quiport Corporation

SCIENTIFIC CONSULTANT

Quito, Ecuador

Dec. 2023

- I analyzed GPS data of two Andean foxes captured in the vicinities of the Mariscal Sucre International Airport in Quito Ecuador.
- I assessed if the animal presented any harm to itself, the public or any aircrafts by estimating their monthly and seasonal home ranges, and resource selection functions using the R programming language.

Universidad Distrital Francisco José de Caldas

THESIS EVALUATING COMMITTEE

Bogotá, Colombia

2021

- Undergraduate Thesis: "Biological knowledge status of the subfamily Stenodermatinae (Gervais, 1856): a cytogenetic revision within an evolutionary framework".

Laboratorio de Genética Evolutiva, Universidad Nacional de Misiones

FIELD AND RESEARCH ASSISTANT

Posadas, Argentina

Aug. 2014 – Apr. 2016

- I was part of collection campaigns with the goal of obtaining biological samples from bats for several genetic and ecological projects.
- As an undergraduate student I was trained in cytogenetic and molecular methods to study the evolution.

Publications

IN PREPARATION

Reference genomes and fossils rewrite bat family-level phylogeny and global biogeography

2026

Morales, A., Liang, Y., Thomas, W.R., Leushkin, E.V., **Castellanos, F. X.**, [...], Ray, D.A., Vernes, S.C., Davalos, L. M., Hiller, M., Teeling E.C. **To be submitted to Nature in January 2026.**

From dawn to dens: Rethinking the diel patterns and movement ecology of the Andean bear *Tremarctos ornatus* in the Ecuadorian Andes

2026

Castellanos, F. X., Jackson, D., Mezzini, S., Brito, J., Castellanos, A. **To be submitted to PLOS One in February 2026.**

PUBLISHED

Mamíferos grandes y medianos en Ecuador: recomendaciones para su captura y manejo

2025

Castellanos, A., Arias, L., Ascanta, M., Dadone, L., Pukazhenth, B., Martínez, E., **Castellanos, F. X.**, Brito, J. *Mammalia Aequatorialis*, 8(1), 103–136. DOI: <https://doi.org/10.59763/mam.aeq.v8i1.133>

Reducción del área de vida de *Tapirus terrestris* criado por la comunidad de Sarayaku, Pastaza, Ecuador

2025

Noboa, M., **Castellanos, F. X.**, Machoa, D., Castellanos, A. *Mammalia Aequatorialis*, 8(1), 137–141. DOI: <https://doi.org/10.59763/mam.aeq.v8i1.148>

Revisiting the taxonomy and biogeography of the largest sigmodontine rodent (Rodentia, Cricetidae) through ancient DNA

2025

Bover, P., Brito, J., **Castellanos, F. X.**, Cuéllar-Soto, E., Hutterer, R., Alfaro-Ibáñez, M.P., Martín-González, M.E., Tammone, M.N., Pardiñas, U.F.J. *Zoological Journal of the Linnean Society*, 205(4). DOI: <https://doi.org/10.1093/zoolinnean/zlaf167>

New altitudinal record of *Myotis moratellii* Novaes et al., 2021 (Chiroptera, Vespertilionidae) in the northwestern foothills of Ecuador

2025

Castellanos, F. X., Simba, L., Brito, J. *Check List* 21(2). DOI: <https://doi.org/10.15560/21.3.506>

Two new species of *Thomasomys* (Cricetidae, Sigmodontinae) from the western Andes of Ecuador, and a phylogenetic update for the genus.

2024

Brito, J., García, R., **Castellanos, F. X.**, Gabriela Gavilanes, Jenny Curay, Julio Carrión, Daniela Reyes, Juan M.

Guayasamin, Jorge Salazar-Bravo, and Pinto, M. Vertebrate Zoology 74: 709-734. DOI:

<https://doi.org/10.3897/vz.74.e128528>.

The evolution of antimicrobial peptides in Chiroptera

2023

Castellanos, F. X., Moreno-Santillan, D., Hughes, G.M., [...], Ray, D.A. and Dávalos, L.M. Frontiers in Immunology 14.

DOI: <https://doi.org/10.3389/fimmu.2023.1250229>

New species of the Spiny Mouse genus *Neacomys* (Cricetidae, Sigmodontinae) from northwestern Ecuador

2023

Tinoco, N., Koch, C., Colmenares J., **Castellanos, F. X.**, and Brito, J. Zookeys 1175:187–221. DOI:

<https://doi.org/10.3897/zookeys.1175.106113>

A pilot study on the home range and movement patterns of the Andean Fox *Lycalopex culpaeus* (Molina, 1782) in Cotopaxi National Park, Ecuador

2021

Castellanos, A., **Castellanos, F. X.**, Kays, R. and Brito, J. Mammalia. 6(1), 22–26. DOI:

<https://doi.org/10.1515/mammalia-2020-0195>

Glyphoncteris, O. Thomas, 1896 (Chiroptera: Phyllostomidae: Glyphoncterinae), a new genus of bats for Argentina, with commentary on its karyotype

2019

Sánchez, M.S., Labaroni C.A., **Castellanos, F. X.** and Baldo, D.J. Mastozoología Neotropical, 26(2):420–429. DOI:

<https://doi.org/10.31687/saremMN.19.26.2.0.12>

Panthera onca

2019

Castellanos, A., **Castellanos, F. X.**, and Vallejo, A.F. In: Brito, J., Camacho, M. A., Romero, V. Vallejo, A. F. (eds).

Mamíferos del Ecuador. Version 2018.0. Zoology Museum, Pontificia Universidad Católica del Ecuador. Online access:

<https://bioweb.bio/faunaweb/mammaliaweb/FichaEspecie/Panthera%20onca>

Artibeus lituratus

2019

Sánchez, Mariano S., **Castellanos, F. X.**, Sandoval, María Leonor. En: SAYDS–SAREM (eds.) Categorización 2019 de los mamíferos de Argentina según su riesgo de extinción. Lista Roja de los mamíferos de Argentina. Digital version:

<http://cma.sarem.org.ar>.

Carollia perspicillata

2019

Castellanos, F. X., Sánchez, Mariano S., Sandoval, María Leonor. En: SAYDS–SAREM (eds.) Categorización 2019 de los mamíferos de Argentina según su riesgo de extinción. Lista Roja de los mamíferos de Argentina. Digital version:

<http://cma.sarem.org.ar>.

PRE-PRINT

The search behavior of terrestrial mammals

2023

Michael J. Noonan, Ricardo Martinez-Garcia, Christen H. Fleming, ... **Castellanos, F. X.**..., William F. Fagan, and Justin

M. Calabrese. bioRxiv. DOI: <https://doi.org/10.1101/2022.12.31.521874>

Teaching Experience

Introduction to Telemetry and Ecology of Large Mammals

Online

FUNDACIÓN OSO ANDINO – INABIO

2022 – 2025

- Basic level introduction to R language, basic statistics and data visualization.
- Intermediate-level students were introduced to home range estimation methods using the adehabitat package.
- Advanced students learned to visualize animal movement with the movevis package and to estimate home ranges using the Convex Hull method with T-LoCoH, and the autocorrelated kernel density estimate with ctmm.

Genomes and Genome Evolution

DEPARTMENT OF BIOLOGICAL SCIENCES, TEXAS TECH UNIVERSITY

- Teaching Assistant.
- Guided graduate students through exercises performed through the Unix command line to analyze genome assemblies via several tools.
- Created a tutorial to annotate eukaryotic genomes using BRAKER3.

Lubbock, USA

2022 – 2024

Biology I (Cell and Molecular biology)

DEPARTMENT OF BIOLOGICAL SCIENCES, TEXAS TECH UNIVERSITY

- Laboratory Teaching Assistant.
- Lab course designed to develop scientific skills: critical thinking, hypothesis testing, T-test.
- Guided students to perform microscopy, spectrophotometry, and fermentation experiments.

Lubbock, USA

2021 – 2022

Biology II (Evolution, Ecology and Physiology)

DEPARTMENT OF BIOLOGICAL SCIENCES, TEXAS TECH UNIVERSITY

- Laboratory Teaching Assistant.
- Dissection labs are performed besides an independent investigation project in which students present a scientific article draft as a final project.
- Led a preparatory session training novice graduate teaching assistants in dissecting and identifying key anatomical structures of various invertebrate specimens.

Lubbock, USA

2022 – 2023

Genetics

DEPARTMENT OF BIOLOGICAL SCIENCES, TEXAS TECH UNIVERSITY

- Laboratory Teaching Assistant.
- Taught topics that included Mendelian genetics, fly crosses to replicate Thomas Morgan’s experiments, and chi-square to understand statistical significance of expected and observed breeding results.

Lubbock, USA

Summer 2022

Professional Associations and Affiliations

Scientific Director, Fundación Oso Andino.

2020 – Present

Regional Chair, Bat1K.

2023 – Present

Member, Society for Molecular Biology and Evolution.

2021 – Present

Awards & Funding

2025	J. Knox Jones, Jr., Memorial Endowed Scholarship. \$1,000 USD	Lubbock, USA
2024	IBA Conference Travel Grant Award. \$2,500 USD	Edmonton, Canada
2023	Bat Biology Foundation Research Award. \$58,000 USD	Lubbock, USA
2023	Short Summer Research Award. \$250 USD	Lubbock, USA
2022	General Fellowships for New and Continuing Graduate Students. \$4,100 USD	Lubbock, USA
2022	Study Abroad Competitive Scholarship. \$1,000 USD	Lubbock, USA
2019	Science and Technology Scholarship. \$100 USD	Posadas, Argentina

Internships

Karyological analyses as a tool for clinical diagnosis of human hereditary diseases

Quito, Ecuador

HOSPITAL CARLOS ANDRADE MARIN, GENETICS AND MOLECULAR UNIT

Feb. 2020

- I was in charge of growing cells from cancer patients for subsequent karyotyping, and determining chromosomal rearrangements through G-banding and FISH.

Conferences

52nd NASBR

Guadalajara, Mexico

BEST ORAL PRESENTATION [KARL KOOPMAN AWARD]

Oct. 2024

- A SINE-based method to reconstruct concordant phylogenies across Chiroptera

28th IBA Conference

Edmonton, Canada

ORAL PRESENTATION

Sept. 2024

- New insights into Andean bear movement ecology across the Ecuadorian Andes

Evolution 2023

Albuquerque, USA

ORAL PRESENTATION

Jun. 2023

- deAMPlifying the Immune Response? Antimicrobial Peptides Evolution in Chiroptera

11th Texas Tech Annual Biological Sciences Symposium.

Lubbock, USA

BEST ORAL PRESENTATION

April 2023

- deAMPlifying the Immune Response? Antimicrobial Peptides Evolution in Chiroptera

XXXI Argentine Conference of Mastozoology

La Rioja, Argentina

POSTER

Apr. 2023

- Chromosomal studies in some species of the genus *Myotis* (Chiroptera: Vespertilionidae) from Northern Argentina.

Writing

Introducción a la Telemetría de Grandes Mamíferos

Quarto Book

FOUNDER & WRITER

2024

- I created an open source and interactive book that includes all the content of the online course taught by Fundación Oso Andino. Available at https://xacfran.github.io/intro_telemetry_r/