Joana L. Rocha, PhD

Email: joana_rocha@berkeley.edu

Website: https://joanocha.github.io/
ORC ID: 0000-0003-3266-6328

EDUCATION AND TRAINING

- 2021-present: Postdoctoral Researcher, University of California, Berkeley. Advisor: Peter H. Sudmant
- 2016-2021: PhD in Biodiversity, Genetics and Evolution, University of Porto. Advisors: Raquel Godinho (University of Porto), Rasmus Nielsen (University of California, Berkeley).
- 2015-2016: Research Assistant in Conservation genomics (CIBIO-InBIO, University of Porto).
- 2012-2014: MSc in Biodiversity, Genetics and Evolution, University of Porto.
- 2012-2013: Research Intern at Max Plank Institute for Evolutionary Anthropology (MPI-EVA). Mentor: Matthias Meyer.
- 2009-2012: BSc in Biology, Faculty of Sciences, University of Porto.

AWARDS AND SCOLARSHIPS

- 2022 - Best runner up talk at the Annual retreat for the Center for Computational Biology at UC-Berkeley – 100 USD
- 2016-2020 - PhD grant, Foundation for Science and Technology, FCT– 60,000 Euros.
- 2016 - Biodiversity, Genetics and Evolution Doctoral Scholarship (awarded but not accepted to receive an FCT PhD grant) – 60,000 Euros.
- 2015-2016 - Research assistant scholarship, FCT. Project: Conservation of the Giant Sable antelope of Angola (CIBIO-InBIO, University of Porto) – 9000 USD.
- 2013-2014 - Award for outstanding academic achievement during MSc degree. University of Porto – 3000 Euros.

PUBLICATIONS

*** denotes co-first author, equal authorship or contribution**

Preprints and submitted manuscripts:

2023 Tyler Linderoth, Diana AguilarGómez, Emily White, Evan Twomey, Adam Stuckert, Ke Bi, Amy Ko, Natalie Graham, **Joana L. Rocha**, Jason Chang, Matthew D. MacManes, Kyle Summers, Rasmus Nielsen (2023): Genetic basis of aposematic coloration in a mimetic radiation of poison frogs (*biorxiv*; DOI: https://doi.org/10.1101/2023.04.20.537757)

Peer-reviewed journals:

2024 Davide Bolognini* Alma Halgren*, Runyang Nicolas Lou*, Alessandro Raveane*, **Joana L. Rocha*,** Andrea Guarracino, Nicole Soranzo, Jason Chin, Erik Garrison, Peter H Sudmant (2023): Global diversity, recurrent evolution, and recent selection on amylase structural haplotypes in humans (*Nature,* DOI: https://doi.org/10.1101/2024.02.07.579378)

2024 **Joana L. Rocha*,** Runyang Nicolas Lou*, Peter H Sudmant (2024): Structural variation in humans and our primate kin in the era of T2T genomes and pangenomics (*Current Opinion in Genetics and Development*, DOI: https://doi.org/10.1016/j.gde.2024.102233)

2024 Kateryna D Makova, Brandon D Pickett, Robert S Harris, Gabrielle A Hartley, Monika Cechova, Karol Pal, Sergey Nurk, DongAhn Yoo, Qiuhui Li, Prajna Hebbar, Barbara C McGrath, Francesca Antonacci, Margaux Aubel, Arjun Biddanda, Matthew Borchers, Erich Bornberg, Gerard G Bouffard, Shelise Y Brooks, Lucia Carbone, Laura Carrel, Andrew Carroll, Pi-Chuan Chang, Chen-Shan Chin, Daniel E Cook, Sarah JC Craig, Luciana de Gennaro, Mark Diekhans, Amalia Dutra, Gage H Garcia, Patrick GS Grady, Richard E Green, Diana Haddad, Pille Hallast, William T Harvey, Glenn Hickey, David A Hillis, Savannah J Hoyt, Hyeonsoo Jeong, Kaivan Kamali, Sergei L Kosakovsky Pond, Troy M LaPolice, Charles Lee, Alexandra P Lewis, Yong-Hwee E Loh, Patrick Masterson, Rajiv C McCoy, Paul Medvedev, Karen H Miga, Katherine M Munson, Evgenia Pak, Benedict Paten, Brendan J Pinto, Tamara Potapova, Arang Rhie, **Joana L. Rocha**, Fedor Ryabov, Oliver A Ryder, Samuel Sacco, Kishwar Shafin, Valery A Shepelev, Viviane Slon, Steven J Solar, Jessica M Storer, Peter H Sudmant, Sweetalana, Alex Sweeten, Michael G Tassia, Françoise Thibaud-Nissen, Mario Ventura, Melissa A Wilson, Alice C Young, Huiqing Zeng, Xinru Zhang, Zachary A Szpiech, Christian D Huber, Jennifer L Gerton, Soojin V Yi, Michael C Schatz, Ivan A Alexandrov, Sergey Koren, Rachel J O'Neill, Evan E Eichler, Adam M Phillippy (2024): The complete sequence and comparative analysis of ape sex chromosomes (*Nature*; DOI: https://doi.org/10.1038/s41586-024-07473-2)

2023 **Joana L. Rocha**, Pedro Silva, Nuno Santos, Monia Nakamura, Sandra Afonso, Abdeljebbar Qninba, Zbyszek Boratynski, Peter H. Sudmant, Jose C. Brito, Rasmus Nielsen‡ and Raquel Godinho‡ (2023), North-African fox genomes show signatures of repeated introgression and adaptation to life in deserts (**cover** of *Nature Ecology and Evolution*; DOI: https://doi.org/10.1038/s41559-023-02094-w).

2022 **Joana L. Rocha***, Pedro Vaz Pinto*, Hans R. Siegismund, Matthias Meyer, Bettine Jansen van Vuuren, Luis Verismo, Nuno Ferrand, Raquel Godinho (2022) African Climate and geomorphology drive evolution and ghost introgression in sable antelope (**cover** of *Molecular Ecology*; DOI: https://doi.org/10.1111/mec.16427)

2021 **Joana L. Rocha**, Raquel Godinho, Jose C. Brito and Rasmus Nielsen (2021), Life in deserts: the genetic basis of mammalian desert adaptation **(***Trends and Ecology and Evolution*; DOI: https://doi.org/10.1016/j.tree.2021.03.007)

2021 **Joana L. Rocha**, Jose C. Brito, Rasmus Nielsen, and Raquel Godinho (2021), Convergent evolution of increased urine concentrating ability in desert mammals (*Mammal Review*, DOI: https://doi.org/10.1111/mam.12244)

Articles written for popular science booklets and magazines:

2016 Whole mitochondrial genome sequencing provides clues about the evolutionary history of the sable antelope and other savannah-adapted African ungulates. In: "*Next Generation Sequencing projects at CIBIO-InBIO-Evolution".* CIBIO-InBIO/UP, Porto, Portugal.

2016 Conservation of the Giant Sable Antelope of Angola. In: "*Next Generation Sequencing projects at CIBIO-InBIO-Conservation & Metagenomics*"; CIBIO-InBIO/UP, Porto, Portugal.

MEDIA HIGHLIGHTS AND PERSPECTIVES

2023 Handling the heat: Desert collaborations unveil the genetic history of how foxes have adapted to a warming climate, article by Samvardhini Sridharan for Berkeley Science Review, Fall 2023, Issue 45.
2023 Genetic variation, selection and hybridization all contribute to desert adaptation in foxes, article by Justin Jackson in Phys.org
2023 Genetics: How foxes adapted to life in the Sahara Desert, highlight by Nature Japan
2022 These rare adaptations help animals survive in the desert, article by Jason P. Dinh for Discover Magazine, Planet Earth
2020 Searching for adaptation secrets in the Sahara Desert, article by Diana Aguilar-Gomez for Berkeley QB3 News

INVITED TALKS AND PRESENTATIONS

2024 T2T meeting (UC Santa Cruz, U.S.A).
2024 Annual meeting of the Society for Molecular Biology and Evolution, SMBE (Puerto Vallarta, Mexico). Symposium: Human genetic variability in the Pangenomic era. Talk: "*PANPANGENOME: Capturing* the full spectrum of genetic variation in humans, chimpanzees and bonobos"
2023 ALUMNI Panelist at the Annual Retreat for the Center of Computational Biology at University of California, Berkeley: academia vs industry.
2023 The Biology of Genomes (Cold Spring Harbor Laboratory, U.S.A). Talk: "PAN-PANGENOMICS: Unravelling structural variation, haplotype diversity and trans-species polymorphisms in humans, chimpanzees & bonobos"
2023 CTEG seminar, The Center for Theoretical and Evolutionary Genetics (University of California, Berkeley, U.S.A). Talk: "The role of structural variation in species diversification and adaptation to environmental change: insights from desert foxes and great apes"
2022 Annual Retreat for the Center of Computational Biology at University of California, Berkeley. Talk: "A Pan-pangenome captures the full spectrum of genetic variation and ancient trans-species structural polymorphism in humans, chimpanzees and bonobos"
2022 T2T meeting (UC Santa Cruz, U.S.A). Talk: "A Pan-pangenome captures the full spectrum of genetic variation and ancient trans-species structural polymorphism in humans, chimpanzees and bonobos."
2021 Virtual Evolution. Talk: "North-African fox genomes reveal signatures of ancient introgression and adaptation to life in deserts"
2019 Bay Area Population Genetics (UC-Berkeley, California, U.S.A). Poster: "Life in the desert: the genetic basis of extreme-environment adaptation in North African foxes"
2015 Annual meeting of the Society for Molecular Biology and Evolution, SMBE (Vienna, Austria). Poster: "The maternal history of the sable antelope inferred from the genomic analysis of complete mitochondrial sequences".
2014 Student Conference on Conservation Science at the University of Cambridge, UK. Poster: "Mitogenomics of *Hippotragus niger*".

PROFESSIONAL EXPERIENCE

Academic peer reviewer

Communications Biology
Nature Ecology and Evolution
Genome Biology and Evolution
Heredity

Interdisciplinary experience

- **Field work:** campaign organization and field expeditions for sampling and phenotyping of wild mammalian species.
- **Experimental ('wet lab'):** Ancient and high-quality genomic DNA extraction and Library preparation for Next Generation Sequencing platforms (Illumina/PacBio/Oxford Nanopore Technology).
- **Computational ('dry lab'):** Bash, Python and R. Genome assembly and evolutionary genomic analyses of short-read/long-read sequencing DNA, RNA-seq, phenotypic datasets.
- **Languages:** Portuguese (Native) | English (Fluent) | Spanish (Fluent) | French (Basic)

Student Mentoring

- Alexandre LeGrand, visiting PhD student from University of Lyon (2022).
- Gonçalo Ferraz, MSc student at University of Porto (2019-2021).

Teaching

- Invited Guest lecturer for CMPBIO 98BC: "Berkeley connect in Computational Biology" (2022).
- Teaching assistant for B4038: "Molecular Methods in Biological Diversity Analysis" at the University of Porto (2015-2016).