GEORGE **PACHECO**

Evolutionary Biologist

DTU Aqua / Vejlsøvej 39, 8600 Silkeborg • Denmark
ganpa@aqua.dtu.dk
+45 4088-8017

25-03-1989 | Natal, Brazil

Initially trained as a biologist in the Brazilian Northeast, I have worked on several projects in the vein of animal evolutionary genomics investigating a diverse range of taxa—from tiny Collembolans to culturally evolving killer whales, which has given me a vast experience in the molecular lab and a fair understanding of the rationale behind bioinformatic analyses. During my scientific career, I have developed a profound interest in the genomic and epigenomic architecture of complex traits. Ultimately, I have a sound interest in the molecular mechanisms implicated in the emergence and maintenance of new and adaptive cognitive traits.

ACADEMIC POSITIONS

Postdoc Researcher | *Technical University of Denmark*
Mar 2021 — Present • Denmark
Advisors: Dr. Jakob Hansen & Dr. Dorte Bekkevold
Location: *Section for Marine Living Resources* | *National Institute of Aquatic Resources*

Postdoc Researcher | *University of Copenhagen*
Jan 2020 — Jun 2020 • Denmark
Advisor: Prof. Thomas Gilbert
Location: *Section for Evolutionary Genomics* | *GLOBE Institute*

ACADEMIC EDUCATION

PhD in Evolutionary Genomics | *University of Copenhagen*
Nov 2014 — Apr 2019 • Denmark
Thesis: Flying Rats Shall No Longer Be: A Population Genomic Analysis of Fancy and Feral Pigeons
Advisor: Prof. Thomas Gilbert
Co-Advisor: Dr. Filipe Vieira
Location: *Centre for GeoGenetics* | *Natural History Museum of Denmark*

MSc in Biology | *University of Copenhagen*
Feb 2012 — Aug 2014 • Denmark
Thesis: Insights into the Feral Pigeon Global Community Gained From Population Genomics
Advisor: Prof. Thomas Gilbert
Location: *Centre for GeoGenetics* | *Natural History Museum of Denmark*

Full Licensing & BSc in Biological Sciences | *Federal University of Rio Grande do Norte*
Aug 2006 — Jul 2011 • Brazil
Thesis: Cytogenetics Characterisation of the Species *Cichlasoma orientale* (Teleostei: Cichlidae: Cichlinae)
Advisor: Prof. Wagner Molina
Location: *Laboratório de Genética de Recursos Marinhos* | *Departamento de Biologia Celular e Genética*

EXTRA LAB EXPERIENCE

Lab Assistant | *University of Copenhagen* (Remunerated)
1 Aug 2013 — June 2014
Employer: Prof. Thomas Gilbert
Location: *Section for Evolutionary Genomics* | *Natural History Museum of Denmark*

Lab Intern | *Federal University of Rio Grande do Norte* (Volunteer)
1 Aug 2007 — 1 Aug 2008
Advisor: Prof. Lucymara Fassarella Agnez-Lima
Location: *Laboratory of Molecular Biology and Genomics*

RELEVANT COURSES

Supervising BSc & MSc Students | 1 ECTS
Dec 2015 | Denmark

University Pedagogy Introduction | 1 ECTS
Oct 2015 | Denmark

Workshop on Genomics | 8 ECTS
Jan 2015 | Czech Republic

Workshop on Molecular Evolution | 8 ECTS
Feb 2015 | Czech Republic

ASSOCIATIONS

Society for the Study of Evolution
Apr 2021 — Present

Danish Society for Neuroscience
Jan 2018 — Present

European Ornithologists' Union
Jan 2018 — Present

LANGUAGES

Portuguese	● ● ● ● ● ● ● ● ● ●
English	● ● ● ● ● ● ● ● ◐ ○
Spanish	● ● ● ● ○ ○ ○ ○ ○ ○
Danish	● ● ○ ○ ○ ○ ○ ○ ○ ○
Russian	◐ ○ ○ ○ ○ ○ ○ ○ ○ ○

MY NUMBERS

40+	**18+**	**6+**
International Collaborators	Involved in Projects	Coffees per Day

GRANTS

EMBO Short-Term Fellowship | 23 Sep — 22 Dec 2019
European Molecular Biology Organization • Germany

Full PhD Abroad Scholarship | Nov 2014 — Oct 2018
Conselho Nacional de Desenvolvimento Científico e Tecnológico • Brazil

Danish Government Scholarship and Tuition Fee Waiver | Feb 2012 — Jan 2014
Ministry of Science, Innovation and Higher Education • Denmark

Student Assistant Scholarship | Mar 2010 — Apr 2011
Conselho Nacional de Desenvolvimento Científico e Tecnológico • Brazil

Scientific Initiation Scholarship | Feb 2009 — Jul 2011
Conselho Nacional de Desenvolvimento Científico e Tecnológico • Brazil

RESEARCH VISITS

Carneiro Lab | 23 Sep — 22 Dec 2019 • Portugal
Research Centre in Biodiversity and Genetic Resources | *University of Porto*

Shapiro Lab | 20 Apr — 19 May 2015 • USA
School of Biological Sciences | *The University of Utah*

TEACHING EXPERIENCE

Supervision of Several Users of the Molecular Labs | *University of Copenhagen*
Feb 2014 — Dec 2018 • Denmark
Location: *Section for Evolutionary Genomics* | *Natural History Museum of Denmark*

Student Assistant of Entomology | *Federal University of Rio Grande do Norte*
Mar 2010 — Apr 2011 • Brazil
Advisor: Prof. Ricardo Andreazze
Location: *Laboratório de Entomologia*

SELECTED SCIENTIFIC EXPEDITIONS

Logistics Activities on the *REBIO Atol das Rocas Conservation Unit*
Nov 2008 | Rio Grande do Norte State • Brazil

Collection of Avian Samples | On behalf of the *10KBird Project*
Feb 2016 | Rukanga Region • Kenya

Collection of Avian Zooarchaeological Samples
Feb 2016 | Negev Desert • Israel

Collection of Avian Samples
Nov 2015 | Tórshavn Region • Faroe Islands

SELECTED SCIENTIFIC EVENTS

II B10K Project Workshop
Feb 2020 | Copenhagen • Denmark

Genome 10K and Genome Science Conference
Aug 2017 | Norwich • England

I B10K Project Workshop
Oct 2016 | Beijing • China

XV Congress of the European Society for Evolutionary Biology
Aug 2015 | Lausanne • Switzerland

LX Brazilian Congress on Genetics
Aug 2014 | Guarujá • Brazil

FAVOURED QUOTATION

"There is grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved."
Nov 1859 — Charles Darwin

COMPUTATIONAL SKILLS

Bash	● ● ● ○ ○ ○ ○ ○ ○ ○
R	● ● ● ○ ○ ○ ○ ○ ○ ○
Python	● ● ○ ○ ○ ○ ○ ○ ○ ○
InDesign	● ● ● ● ○ ○ ○ ○ ○ ○
Illustrator	● ● ● ○ ○ ○ ○ ○ ○ ○
Photoshop	● ● ● ○ ○ ○ ○ ○ ○ ○

OTHER RELEVANT TRAINING

Participation in the XXIX Training for the Archipelago of St. Peter and St. Paul
Aug 2009 | Naval Base of Natal / Brazil

PADI Open Water Diver
Jul 2008 | Natal / Brazil

RELEVANT VOLUNTEER WORK

Science Faculty Mentor Programme
University of Copenhagen
Aug 2012 — Dec 2017 | Denmark

March for Science Copenhagen
Apr 2017 | Denmark

REFERENCES

Thomas Gilbert | Professor
University of Copenhagen | *Denmark*
tgilbert@sund.ku.dk
+45 23712519

Filipe Vieira | Senior Bioinformatician
Rigshospitalet | Denmark
filipe.garrett.vieira@regionh.dk
+45 50208262

Hein Van Grouw | Senior Curator
Natural History Museum | UK
h.van-grouw@nhm.ac.uk
+44 7792581455

HOBBIES

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LIST OF PUBLICATIONS

Peer-reviewed / In Press

The Germline Mutational Process in Rhesus Macaque and Its Implications for Phylogenetic Dating Bergeron L., Besenbacher S., Bakker J., Zheng J., Li P., **Pacheco G.**, Sinding M. S., Gilbert M. T. P., Schierup M. H. & Zhang G. ***GigaScience*** / **Vol.** 10, **pp.** 1–14 • **2021**

ROLE: I performed crucial lab work for this project, mainly working as the tutor of the leading author of this project (Dr. Lucie Bergeron) in our labs in Copenhagen, whom I introduced to some of the modern techniques that were used in this study. I also revised and approved the final version of this drafted article.

Why TRPV6 Currents Are Not Detectable in Native Cells — What Can We Learn from Bats? Wolske K, Fecher-Trost C., Wesely C., Löhr H., Philipp S., Flockerzi V., **Pacheco G.** & Wissenbach U. ***Cell Calcium*** **/ Vol.** 92, **Article Nr.** 102302 • **2020**

ROLE: I conducted some lab work for this project. I also revised and approved the final version of the drafted article.

Dense Sampling of Bird Diversity Increases Power of Comparative Genomics Feng S., Stiller J., Deng Y., Armstrong J., Fang Q., Reeve A. H., Xie D., Chen G., Guo C., Faircloth B. C., Petersen B., Wang Z., Zhou Q., Diekhans M., Chen W., Andreu-Sánchez S., Margaryan A., Howard J. T., **Pacheco G.** , Sinding M. S., Puetz L., Cavill E., Ribeiro Â. M., Fjeldså J., Hosner P. A., Brumfield R. T., Christidis L., Bertelsen M. F., Tietze D. T., Robertson B. C., Song G., Borgia G., Claramunt S., Lovette I. J., Cowen S. J., Njoroge P., Dumbacher J. P., Ryder O. A., Fuchs J., Bunce M., Burt D. W., Cracraft J., Meng G., Hackett S. J., Ryan P. G., Jønsson K. A., Jamieson I. G., da Fonseca R. R., Braun E. L., Houde P., Mirarab S., Suh A., Stervander M., Hansson B., Sigeman H., Ponnikas S., Frandsen P. B., Van der Zwan H., Balakrishnan C. N., Clark A. G., Fitzpatrick J. W., Bowman R., Chen N., Cloutier A., Sackton T. B., Foote D. J., Shakya S. .B, Sheldon F. H., Vignal A., Soares A. E. R., Shapiro B., González-Solís J., Ferrer-Obiol J., Rozas J., Riutort M., Tigano A., Friesen V., Dalén L., Urrutia A. O., Székely T., Liu Y., Campana M. G., Corvelob A., Fleischer R. C., Rutherford K. M., Gemmell N. J., Dussex N., Mouritsen H., Thiele N., Delmore K., Liedvogel M., Franke A., Hoeppner M. P., Krone O., Fudickar A. M., Milá B., Ketterson E. D., Fidler A. E., Friis G., Parody-Merino Á. M., Battley P. F., Cox M. P., Lima N. C. B., Prosdocimi F., Parchman T. L., Schlinger B. A., Loiselle B. A., Blake J. G., Lim H. C., Day L. B., Fuxjager M. J., Baldwin M. W., Braun M. J., Wirthlin M., Dikow R. B., Ryder T. B., Camenisch G., Keller L. F., DaCosta J. M., Hauber M. E., Louder M. I. M., Witt C. C., McGuire J. A., Mudge J., Megna L. C., Carling M. D., Wang B., Taylor S. A., Del-Rio G., Aleixo A., Vasconcelos A. T. R., Mello C. V., Weir J. T., Haussler D., Li Q., Yang H., Wang J., Lei F., Rahbek C., Gilbert M. T. P., Gary R. Graves, Jarvis E. D., Paten B. & Zhang G. ***Nature*** **/ Vol.** 587, **pp.** 252–257 • **2020**

ROLE: Acting as the main responsible person for this large-scale genomic project in Copenhagen, I performed a massive amount of lab work for this study. Moreover, I also contributed to the drafting of this article and approved its final version.

Phylogeny of Neotropical Seirinae (Collembola, Entomobryidae) Based on Mitochondrial Genomes Nerivania G., **Pacheco G.**, Shanlin L., Cipola N., Berbel-Filho W., Feng Z., Gilbert M. T. P. & Bellini B. ***Zoologica Scripta*** **Issue /** 0, **pp.** 1–11 • **2020**

ROLE: I was involved in this project since its conception, namely in securing a visiting PhD scholarship to the first author of this study (Dr. Nerivania Godeiro), who I helped to train in molecular techniques at our labs in Copenhagen. Then, I generated together with Neri part of the data that was used in this project. I also contributed to the article writing process and approved its final version.

Darwin's Fancy Revised: An Updated Understanding of the Genomic Constitution of Pigeon Breeds **Pacheco G.**, van Grouw H., Shapiro M. D., Gilbert M. T. P. & Vieira F. G. ***Genome Biology and Evolution*** **/ Vol.** 12, **Issue** 3, **pp.** 136–150 • **2020**

ROLE: This was one of the main articles that composed my PhD thesis, thus I acted as the leader author of this study from its commencement until its end.

Evolutionary History, Genomic Adaptation to Toxic Diet and Extinction of the Carolina Parakeet Gelabert P., Sandoval-Velasco M., Serres A., Renom P., Margaryan A., de-Dios T., Fang Q., Feng S., Mañosa S., **Pacheco G.**, Ferrando-Bernal M., Shi G., Hao F., Chen X., Stiller J., Petersen B., Navarro A., Marquès-Bonet T., Deng Y., Dalén L., Zhang G., Antunes A., Gilbert M. T. P. & Lalueza-Fox C. ***Current Biology*** **/ Vol.** 30, **pp.** 1–7 • **2019**

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ROLE: I performed crucial lab work for this project, such as DNA extractions and molecular quality checks. Naturally, I also contributed to the article writing process and approved its final version together with all other authors.

The Discovery of *Lepidosira* Schött 1925 (Collembola, Entomobryidae) in Neotropical Region and Its Systematic Position Among the Entomobryinae Nunes R. C., Godeiro, N. N., **Pacheco G.**, Liu S., Gilbert M. T. P., Alvarez-Valin F., Zhang F. & Bellini B. C. ***Zoologica Scripta* / Vol.** 48, **Issue** 6, **pp.** 783-800 • **2019**

ROLE: This was a side projected that resulted from Neri's visited to Copenhagen (see article 2), thus my role was the same here.

High-coverage Genomes to Elucidate the Evolution of Penguins Pan H., Cole T. L., Bi X., Fang M., Zhou C., Yang Z., Hart T., Bouzat J. L., Argilla L. S., Bertelsen M. F., Boersma P. D., Bost C., Cherel Y., Dann P., Fiddaman S. R., Howard P., Labuschagne K., Mattern T., Miller G., Parker P., Phillips R. A., Quillfeldt P., Ryan P. G., Taylor H., Thompson D. R., Young M. J., Ellegaard M. R., Gilbert M. T. P., Sinding M. S., **Pacheco G.**, Shepherd L. D., Tennyson A. J. D., Grosser S., Kay E., Nupen L. J., Ellenberg U., Houston D. M., Reeve A. H., Johnson K., Masello J. F., Stracke T., McKinlay B., Zhang D. X. & Zhang G. ***GigaScience*** **Vol.** 8, **Issue** 9, **pp.** 1 -17 • **2019**

ROLE: I performed crucial lab work for this project, such as sample acquisition, DNA extractions and molecular quality checks. I also contributed to the article writing process and approved its final version together with all other authors.

Killer Whale Genomes Reveal a Complex History of Recurrent Admixture and Vicariance Foote A. D., Morin P. A., Martin M. D., Gopalakrishnan S., Louis M., **Pacheco G.**, Robertson K. M., Sinding M-H. S., Sousa C. S., Amaral A. R., Baird R. W, Baker C. S., Balance L., Barlow J., Brownlow A., Collins T., Constantine R., Dabin W., Rosa L. D., Davison N. J., Durban J. W., Esteban R., Ferguson S. H., Forney K. A., Gerrodette T., Guinet C., Hanson M. B., Hoggard W., Kaschner K., Matthews C. J. D., Pitman R. L., Samarra F. I. P., de Stephanis R., Tavares S., Tixier P., Totterdell J. A., Wade P., M. Gilbert M. T. P., Wolf J. B. W. & Excoffier L. ***Molecular Ecology* / Vol.** 28, **Issue** 14, **pp.** 3427–3444 • **2019**

ROLE: I performed crucial lab work for this project, such as sample acquisition, DNA extractions and molecular quality checks. I also received the leading author of this project (Dr. Andrew Foote) at our labs in Copenhagen and introduced him to some of the modern techniques that were used in this study. I also contributed to the article writing process and approved its final version together with all other authors.

Hologenomic Adaptations Underlying the Evolution of Sanguivory in the Common Vampire Bat Mendoza M. L. Z., Xiong Z., Escalera-Zamudio M., Runge A. K., Thézé J., Streicker D., Frank H. K., Loza-Rubio E., Liu S., Ryder O. A., Castruita J. A. S., Katzourakis A., **Pacheco G.**, Taboada B., Löber U., Pybus O. G., Li Y., Rojas-Anaya E., Bohmann K., Baez A. C., Arias C. F., Liu S., Greenwood A. D., Bertelsen M. F, White N. E., Bunce M., Zhang G., Sicheritz-Pontén T. & Gilbert, M. T. ***Nature Ecology & Evolution* / Vol.** 2, **pp.** 659–668 • **2018**

ROLE: I performed crucial lab work for this project, such as DNA extractions, molecular quality checks and PCR experiments. I also contributed to the article writing process and helped its main author to finish up its final draft version based on inputs from all other collaborators.

Genomic Population Structure of Freshwater-resident and Anadromous Ide (*Leuciscus idus*) in North-western Europe Skovrind M., Olsen M. T., Vieira F. G., **Pacheco G.**, Carl H., Gilbert M. T. & Møller P. R. ***Ecology and Evolution*** **Vol.** 6, **Issue** 4, **pp.** 1064–1074 • **2016**

ROLE: I performed crucial lab work for this project, such as DNA extractions and molecular quality checks. But most importantly, I introduced the main author of this study (Dr. Mikkel Skovrind) to the modern sequencing method that was used in this project. I also contributed to the article writing process and approved its final version.

Padrões Citogenéticos de Duas Espécies de Ciclídeos de Bacias do Semi-árido do Brasil: *Crenicichla menezesi* e *Cichlasoma orientale* Molina, W. F., **Pacheco, G. A.** & Berbel Filho, W. M. ***Biota Amazônia*** • **2014**

ROLE: I conducted many of the experiments for this project and also wrote an initial drafted article version.

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Submitted / Under Review

Additive and Non-additive Epigenetic Signatures of Hybridisation Between Fish Species with Different Mating Systems Berbel-Filho W. M., Tatarenkov A., **Pacheco G.**, Espirito-Santo H. M. V., Lira M. G., de Leaniz C. G., Avise J. C., Lima S. M. Q., Rodríguez-López C. M. & Consuegra S. **/** Under revision in ***Evolution*** (***First Round of Revision***).

ROLE: I conducted several bioinformatic analyses for this project and also contrinuted to the discussion of the results and the writing of the drafted article.

Conservation Genomics of the Endangered Seychelles Magpie Robin (*Copsychus sechellarum*): A Unique Insight into the History of a Precious Endemic Bird Cavill E., Gopalakrishnan S., Puetz L., Ribeiro Â., Mak S., da Fonseca R., **Pacheco G.**, Dunlop B., Accouche W., Shah N., Zora A., Calabrese L., Genner M., Jones G., Guo C., Zhang G. & Gilbert, M. T. P **/** Under revision in ***IBIS*** (***Second Round of Revision***).

ROLE: I performed crucial lab work for this project, such as DNA extractions, molecular quality checks and PCR experiments. I also contributed to the article writing process and helped its main author to finish up its final draft version based on inputs from all other collaborators.

In Preparation

Genomic Insights into the Ubiquitous Feral Pigeon's Formation **Pacheco G.**, Vieira F. G., Martin M. D., Olsen M. T., Hulva P., Raso T. deF., Njoroge P., Salaberria C., López-Rull I., Lalueza-Fox C., Ramírez O., Ávila-Arcos M. C., Escobar P. R., Faria R., Carneiro M., Sotelo G., Danielsen J., Haddad N., Khoury F., Dor R., Halajian A., Arias M. B., Krone O., Auls S., Seneviratne S. S., Mathiaparanam K., Bunce M., Coghlan M. L., Fjeldså J. & Gilbert M. T. P.

ROLE: This was one of the main articles that composed my PhD thesis, thus I acted as the leader author of this study from its commencement until now that we are close to submitting it to publication.

Genomic Variation Among European Perch *Perca fluviatilis* Driven by Differentiated Habitat and Selection Skovrind M., **Pacheco G.**, Olsen M. T., Fietz K., Christensen E. F. A., Kragh M. A., Vieira F. G., Carl H., Gilbert M. T. P. & Møller P. R.

ROLE: I conducted several bioinformatic analyses for this project and also contrinuted to the discussion of the results as well as to the writing of the article.

Evolutionary Genomics of the Rarest Mammal in the World, the Microendemic *Cavia intermedia* (Caviidae, Mammalia Escalona M. A. R., de Manuel M., Gopalakrishnan S., **Pacheco G.**, Barreiro F. S., Ciucani M. M., Sinding M.-H. S., Margaryan A., Petersen B., Furnari N., Gava A., Cherem J., Salvador C. H., Dalén L., Gilbert M. T. P. & Bonatto S. L.

ROLE: During his visit at our labs in Copenhagen, was responsible to introduce the main author of this study (Dr. Manuel Escalona) to the sequencing techniques used in this project. Thus, together with Manuel, I carried out wet lab work for this project as well as contributed to some of the analyses and rationale applied to this project.

I am also involved in several other genomic projects — from birds to snakes, which will certainly be published in due time.