



Prof. Dr. Ludovic Orlando, HDR, PhD, Agrégé, Normalien

Director, Centre for Anthropobiology & Genomics of Toulouse, CAGT

Université Paul Sabatier Toulouse III, France

Born in Marseille (France), January 24th 1977 (47 years old)

Married, three children

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Scientific Areas

Ancient DNA, Animal Domestication, Molecular Anthropology, Evolutionary Biology, Statistical Genomics

Scientific Achievements

- Led the international teams that:
 - Bridged western and Indigenous science by revisiting the history of First Nations horses [*Science* 2023]
 - Identified the domestication homelands of horses [*Science* 2018; *Nature* 2021, 2024] and donkeys [*Science* 2022]
 - Reconstructed the genomic history of horse domestication [*Science* 2017, *Cell* 2019]
 - Described the first ancient epigenome [*Genome Research* 2014, *Science* 2014]
 - Sequenced the first Middle Pleistocene genome [*Nature* 2013]
 - Tracked the genetic consequences of the last great Megafauna extinction [*Nature* 2011]
- Contributed to the international teams that:
 - Assessed the environmental consequences of global climate change in the Arctic [*Nature* 2014, 2016, 2020]
 - Sequenced 2000+ ancient human genomes [*Nature* 2014ab, 2015, 2018ab, 2024; *Science* 2014, 2017, 2018ab]
 - Sequenced the first ancient human genome [*Nature* 2010]

Track Record of Early Achievements

As of Aug 1st 2024, I have co-authored 220 articles in international peer-reviewed journals (70, ~32 %, of which since 2019). These appeared in *Nature* (24), *Science* (16), *Cell* (4), *PNAS* (12), as well as top-specialist journals in the field of genomics (*Genome Res*), evolutionary biology (*Mol Biol Evol*, *Mol Ecol*), computational biology (*Bioinformatics*) and archaeological science (*J Arc Sci*). I have also published 9 Book Chapters, 3 books and multiple reviews in high-impact journals, including in *Nat Rev* (2015, 2020, 2021) and the *Annual Reviews* series (2014, 2017, 2020, 2021). I have been invited to write opinion articles for *Nature* (2023), *Science* (2023), *Cell* (2020), *PNAS* (2016, 2018, 2023), *Curr Biol* (2015), *Genome Biology* (2015) and *Bioessays* (2014, 2020). Collectively, my papers have attracted 42,925 citations (Google Scholar), 18,540 (~43%) of which since 2021, and my H-index is 100. I have co-organized 11 international conferences, chaired/co-organized 7 sessions (including at Cold Spring Harbor *Biology of Genomes* and UISPP) and been the opponent for 23 international PhD committees in 7 countries, including at high-rank universities such as Oxford. I have lectured 1,500+ hours at all university levels and tutored 13 international workshops. I have won 1 ERC Consolidator and 1 ERC Synergy grant, plus multiple Danish, French and European grants, totaling 16.6 M€. I am an Academic Editor for *Scientific Reports* and *PeerJ*, and Editor-in-Chief of *Science and Technology for Archaeological Research*. I have been awarded several internationally recognized scientific prizes, including the CNRS Silver Medal (2023) and the AAAS Newcomb Cleveland Prize (2024). I have supervised 12 PhD students and 22 post-doctoral researchers, and have been acting since Jan 1st 2021 as the founding director of the Centre for Anthropobiology and Genomics of Toulouse, a transdisciplinary centre combining the expertise of 60+ staff to research our global evolutionary past.

Education

Dec 14 th 2009	Professorial thesis (HDR) , ENS Lyon, France
July 7 th 2003	PhD with highest honors. University of Lyon, France
July 2000	MSc in Development, Genetics and Immunology, University of Lyon, France (ranking: 1 st)
July 1999	Agrégation of Life and Earth Sciences (ranking: 4 th / >2,000 applicants)
Sept 1996–July 1998	Magistère of Cellular and Molecular Biology, ENS Lyon, France
Sept 15 th 1996	Admitted after national competitive examination of >2,000 applicants as Normalien at ENS Lyon

Prizes & Awards

Feb 2024	AAAS Newcomb Cleveland Prize
Nov 2023	CNRS Silver Medal
Nov 2023	Cadre Noir Award (Pegasus Academy) for the best popular science book on horses
Jan 2018, 2020	Highly Cited Researcher List 2018, 2020
2004	Annual Academic Award <i>Le Monde</i> de la Recherche Scientifique

Academic Positions

Jan 2021–now	Director , CNRS CAGT Laboratory, Univ. Paul Sabatier, Toulouse, France
Jan 2020–Dec 2020	Director , CNRS AMIS Laboratory, Univ. Paul Sabatier, Toulouse, France
Oct 2016–Jun 2020	Deputy Director , CNRS AMIS Laboratory, Univ. Paul Sabatier, Toulouse, France Research Director , CNRS, Univ. Paul Sabatier, Toulouse, France Professor of Molecular Archaeology, CGG, Copenhagen, Denmark (20% full-time equivalent)
Jan 2015–Sept 2016	Invited Professor , IDEX Chair of Excellence, Univ. Toulouse (20% full-time equivalent)
Mar 2016–Sept 2016	Professor of Molecular Archaeology, CGG, Copenhagen, Denmark Curator of the National Cryobank, Natural History Museum of Denmark
Jul 2014–Jul 2015	Curator of the Paleontology collection, Natural History Museum of Denmark
Jul 2013–Jul 2015	Curator of the Quaternary Zoology collections, Natural History Museum of Denmark
Apr 2010–now	Group Leader
Apr 2010–Feb 2016	Associate Professor of Molecular Archaeology, CGG, Copenhagen, Denmark
Sep 2005–Mar 2010	Assistant Professor , ENS Lyon, Institute for Functional Genomics of Lyon (IGFL), France

Professional Service

2024	ERC , “Assessing the ERC Impact on Scientific Progress”, Evaluation Expert
Dec 2017	HCERES Evaluation committee, ISYEB, Committee President
Apr 2017–now	Editorial Board , Associate Editor, <i>PeerJ</i>
Sep 2016–now	Editorial Board , Associate Editor, <i>Scientific Reports</i>
2015, 2016	Expert Member of the Institut Universitaire de France, Young Scientist panel
2014–now	Editorial Board , Editor-in-Chief, <i>Science and Technology of Archaeological Research</i>
2012–2020	Editorial Board , Academic Editor, <i>PLoS ONE</i>
2012–2013	Expert Member of the SVSE7 Evaluation Committee of the French National Agency for Research
2009–2011	Expert Member of the French RTP CNRS “ <i>Paleogenetics of ancient humans and their environment</i> ”
2007–2009	Scientific Council of the Institute for Functional Genomics, ENS Lyon (CNRS UMR 5242)

Research Supervision and Research Funding

- **Group Leader of a research group currently consisting of 23 staff members**, including:
 - 1 CNRS Research Director
 - 1 Professor
 - 1 Associate Professor
 - 3 CNRS Researchers
 - 2 CNRS Research Engineers
 - 1 INRAE Research Engineer
 - 2 CNRS Assistant Engineers
 - 2 Univ. Paul Sabatier Assistant Engineers
 - 4 Post-doctoral researchers
 - 6 PhD students
- **Main Supervisor of 22 post-doctoral researchers, 12 PhD students, 19 MSc students**
- **Attracted 25 international post-doctoral researchers since 2011**, representing ~3.31 M€ and including:
 - 2025–2027: 3 MSCA-PF fellowships, **211,754.88€**, **211,754.88€** and **195,914.88€**
 - 2021–2023: 2 MSCA-IF fellowships, **196,707.84€** and **184,707.84€**
 - 2020–2021 : 1 Fondation Simone & Cino Del Duca, **50,000€**.
 - 2022–2024: 2 MSCA-IF fellowships, **184,707.84€** and **195,914.88€**
 - 2020–2023: 1 MSCA-IF fellowship, **186,876.96€**
 - 2020, 2023: 2 Postdoctoral Exchange Fellowship Program of the China Postdoctoral Council, **77,000€**
 - 2018–2020: 1 MSCA-IF fellowship, **173,076€**
 - 2017–2019: 1 MSCA-IF fellowship, **200,194.8€**
 - 2016–2017: 1 EMBO long-term fellowship, **791,076.6 DKK+6,018.62 €**
 - 2015–2017: 1 MSCA-IF fellowship, **200,194.8€**
 - 2014–2016: 1 Marie-Curie FP7-PEOPLE-IEF fellowship, **221,154.6€**)
 - 2015–2016: 1 VillumFonden Blokstipendier, **1,090,916 DKK**
 - 2012–2014: 2 Marie-Curie FP7-PEOPLE-IEF fellowships, **228,082.6 €** and **218,560.2 €**
 - 2012–2014: 1 AXA Research Fund fellowship, **120,000€**
- **Main Investigator for 23 grants representing ~16.6 M€**
 - 2024–2027: BasicExtinct, TIRIS Scaling Up Science Programme, **325,822€**
 - 2023–2029: ERC SyG Horse Power, **10,478,093€** [<https://www.horsepowerproject.org/>]
 - 2021–2025: CNRS IRP AnimalFarm, **50,000€**

- 2022–2023: MARENGO, France Génomique Appel à Grand Projet, 30 S4 lanes for the NovaSeq 6000 instrument
- 2020–2021: Foundation Simone & Cino Del Duca, **125,000€**
- 2020–2021: CNRS MITI **40,000 €**
- 2019–2020: ANR MRSEI AnimalFarm, **29,970€**
- 2017–2020: GENCI A0050310593, 1M CPU hours on HPC servers
- 2017–2021: ANR LifeChange, **492,032€**
- 2016–2021: ERC-Consolidator, **1,999,555€**
- 2016–2019: *Villum Fonden Research Project*, **5,995,928 DKK**
- 2017–2018: BUCEPHALE, France Génomique Appel à Grand Projet, 32 flow-cells for the HiSeq 4000 instrument
- 2015–2017: Chaire d'attractivité, IDEX, Univ. Toulouse, France **750,000€**
- 2015: EU Synthesis-3 Programme, **2,000€**
- 2014–2017: *DFF Danish Research Foundation, Major Research Project*, **5,218,917DKK**
- 2014: *DASI International Network Programme*, **222,507 DKK**
- 2014–2016: *Villum Fondens Blokstipendier*, **1,090,916 DKK**
- 2014–2015: *Int Research Group Program (IRG14-08), Deanship of Scientific Research*, King Saud Univ, **75,000€**
- 2012–2015: *Marie-Curie FP7-PEOPLE-CIG*, **100,000€**
- 2012–2015: *DFF FNU Minor Research Project*, **1,958,400 DKK**
- 2012: GEUS/Geogenetics/Geocenter, **975,000 DKK**
- 2008–2009: *French-Australian Science and Technology linkage*, **12,000€**
- 2011, 2012: *French-Danish Co-operation from the French Embassy*, **45,000 DKK**
- **Co-Investigator for 14 Grants** since 2010 (including 4 ANR, 1 ANRS & 2 Marie Curie ITN *EUROTAST* & *ArchSci2020*)

Selection of 10 Peer-Reviewed Publications (see <https://cagt.cnrs.fr/orlando-ludovic/> for a full list)

- 1) Librado P, [139 co-authors], Orlando L. **2024**. Widespread horse-based mobility arose around 2,200 BCE in Eurasia. **Nature** 631, 819-825
- 2) Taylor WT, [87 co-authors], **Orlando L. 2023**. Early dispersal of domestic horses into the Great Plains and Northern Rockies. **Science** 379, 1316-1323
- 3) Todd ET, [47 co-authors], **Orlando L. 2022**. The genomic history and global expansion of domestic donkeys. **Science** 377:1172-80
- 4) Librado P, [161 co-authors], **Orlando L. 2021**. The origins and spread of domestic horses from the Western Eurasian steppes. **Nature** 598:634-640
- 5) Fages A, [119 co-authors], **Orlando L. 2019**. Tracking Five Millennia of Horse Management with Extensive Ancient Genome Time Series. **Cell** 2019 Apr 26. pii: S0092-8674(19)30384-8
- 6) Gaunitz C, [45 co-authors], **Orlando L. 2018**. Ancient genomes revisit the ancestry of domestic and Przewalski's horses. **Science** 360:111-114
- 7) Librado P, [31 co-authors], **Orlando L. 2017**. Ancient genomic changes associated with domestication of the horse. **Science** 356:442-5
- 8) Der Sarkissian C, [24 co-authors], **Orlando L. 2015**. Evolutionary genomics and conservation of the endangered Przewalski's horse. **Curr Biol** 25:2577-83
- 9) Pedersen JS, [19 co-authors], **Orlando L. 2014**. Genome-wide nucleosome map and cytosine methylation levels of an ancient human genome. **Genome Res** 24:454-66
- 10) **Orlando L.**, [54 co-authors], Willerslev E. **2013**. Recalibrating *Equus* evolution using the genome sequence of an early Middle Pleistocene horse. **Nature** 499:74-8

Research Production, Summary

- H-index: **100** [Google Scholar]
- Citations: **42,925** [Google Scholar]
- **220 publications** in peer-reviewed journals (24 **Nature**, 16 **Science**, 4 **Cell**, 12 **PNAS**, 10 **Curr Biol**, 3 **Genome Res**)
- **3 Books**, **9 Book chapters**
- **Referee** for 250+ Articles (~10 per year), including *Nature*, *Science*, *Cell*, *PNAS* and *Curr Biol*
- **189 Invited Seminars and Conferences across 29 countries**
- Invited lecturer in **13 international workshops**:
 - Jul 2024: Institute of Animal Science, Chinese Academy of Agricultural Science, Beijing
 - Feb 2020: Workshop on Population and Speciation Genomics, Český Krumlov
 - Feb 2018: Workshop on Population and Speciation Genomics, Český Krumlov
 - Dec 2016: Italian Society for Evolutionary Biology, Ferrara, Italy
 - May 2016: Spring School in Bioinformatics and Population Genomics. Leukerbad, Switzerland, May 2016
 - Feb 2016: Workshop on Population and Speciation Genomics, Český Krumlov
 - Mar 2016: Max Planck Institute for the Science of Human History, Jena
 - Jun 2015: Mathematical and Computational Evolutionary Biology, Porquerolles

- Dec 2013: Computing for NGS analyses, Toulouse
- Nov 2013: Adelaide Bioinformatics Workshop, Adelaide
- Nov 2012: Adelaide Bioinformatics Workshop, Adelaide
- Jun 2012: Gulbenkian Training Program in Bioinformatics, Lisbon
- Oct 2011: Paleogenomics summer school, Cargese
- Organization of **11 international conferences**:
 - 14th International Havemeyer Horse Genome Workshop 2024
 - SPAAM 2016
 - UISPP 2018
 - ISBA 2018
 - AnimalFarm 2019
 - AIEM 2019
 - ISBA 2020
 - SMBE 2012
 - INQUA 2011
 - SBME 2010
 - ISBA 2010
- Participation to **23 international PhD** (AUS 2; DK 4; FR 10; SP 2; CH 1; IE: 1; SW 1; PT 1; UK 1) and **5 Habilitation** committees (French Professorial Thesis, 2016, 2017, 2018, 2020, 2022)

Selection of 10 Invited Scientific Communications (see <https://cagt.cnrs.fr/orlando-ludovic/> for a full list of 189)

01/10/2024	Plenary. In: IEIDCXII 2024. Deauville, France
12/07/2023	Hilgendorf Lecture. Tuebingen, Germany
13/12/2022	Harrison Lecture. The genomic history of the domestic horse. Cornell University, Ithaca, USA
25/07/2022	Plenary. In: Havemeyer 13 th International Horse Genome Workshop. Ithaca, USA
11/01/2022	Plenary. In: Plant and Animal Genomics XXIX. San Diego, USA
20/02/2020	Keynote. In: Inauguration day of the Centre for Palaeogenetics, Swedish Museum of Natural history, Stockholm
17/06/2019	Keynote. International Society for Applied Biological Sciences. Split, Croatia
30/03/2019	Keynote. Reconstructing the Human Past - Using Ancient and Modern Genomics. EMBL Heidelberg, Germany
04/11/2018	Keynote. In: Australian Genomic Technologies Association (AGTA) Annual Meeting, Adelaide, Australia
18/04/2018	Keynote. In: 1 st AsiaEvo Conference, Shenzhen, China

Communication & Outreach [Short selection]

Radio & TV/Videos

18/04/2024	BBC Science in Action , Roland Pease [https://www.bbc.co.uk/programmes/w3ct5vcl , 21:40]
01/03/2023	Ancient DNA reveals history of hunter-gatherers in Europe. The New York Times , Carl Zimmer
01/05/2022	Marilyn: her final secret. Documentary , François Pomès https://www.sbs.com.au/ondemand/video/2045259843619/marilyn-her-final-secret
26/08/2023	La conquête du cheval : une révolution. France Culture , Carbone 14. https://www.radiofrance.fr/franceculture/podcasts/carbone-14-le-magazine-de-l-archeologie/la-conquete-du-cheval-une-revolution-8587248
27/05/2023	The horse is the first instrument of globalization. LUMA Foundation , Arles. https://www.luma.org/en/live/watch/ludovic-orlando-itw-578c4477-a261-4985-9351-344b94fef776.html
13/01/2021	L'ADN remonte le temps. Arte 28 minutes, Elisabeth Kein.
22/10/2021	Whoa Nelly! Modern horses come from ancestors we improved 4,000 years ago. CBC Radio , Bob McDonald, Quirks & Quarks https://www.cbc.ca/radio/quirks/oct-23-vikings-in-newfoundland-new-rocks-from-the-moon-making-wood-better-and-more-1.6219865/whoa-nelly-modern-horses-come-from-ancestors-we-improved-4-000-years-ago-1.6219867
14/05/2019	The first horse warriors. NOVA , documentary by Dr Niobe Thompson
09/05/2019	5000 ans d'histoire du cheval. France Inter La tête au carré, Mathieu Vidard
22/02/2018	Why the last wild horses really aren't. National Public Radio , Nell Freenfieldboyce https://www.npr.org/sections/thetwo-way/2018/02/22/587755920/why-the-last-wild-horses-really-arent

International Press

06/06/2024	Origins of modern horses traced to breeding revolution 4200 years ago. NewScientist , Christa Lesté-Lassère
14/03/2023	At long last, a donkey family tree. The New York Times , Franz Lidz
14/01/2022	Ancient Mesopotamians bred horselike hybrids. The Scientist , Chris Baranluk
22/10/2021	Ancient DNA points to origins of modern domestic horses. Nature , Tosin Thompson

20/10/2021 The horse you rode in on May have been made in Southern Russia. **The New York Times**, Sabrina Imbler
 17/02/2021 Mammoth molars yield the oldest DNA ever sequenced. **Science**, Michael Price
 02/05/2019 Speedy horses evolved only recently. **National Geographic**, Jason Bittel
 02/05/2019 Ancient DNA reveals two lost lineages of horses—but not their elusive origins. **Science**, Elisabeth Pennisi
 27/04/2017 Long-frozen DNA shows how humans made horses faster. **Washington Post**, Ben Guarino
 28/12/2015 The horse that can endure Siberian winters. **BBC Earth**, Jane Palmer

Open Conferences & Exhibitions [Non-scientific audience]

03/06/2024 La conquête du cheval : un voyage génétique à travers le temps. Musée de l'Homme, Paris
<https://www.youtube.com/watch?v=6qp7uYSEuw4>
 31/05/2024 La conquête du cheval : une histoire génétique. Fédération Française d'Équitation, Lamotte-Beuvron
<https://www.youtube.com/watch?v=mEXzIlevRww>
 17/05/2023 L'origine du cheval, un voyage génétique dans le temps. École des courses hippiques AFASEC, Mont-de-Marsan; <https://www.youtube.com/watch?v=MWIEXdRv50>
 20/03/2023 L'histoire de l'humanité vue sous l'angle de la paléogénomique. Collège de France, Paris
<https://www.youtube.com/watch?v=McJm-J5F6Qo>
 28/11/2023 La conquête du cheval - Une histoire génétique. Cœur des sciences – UQAM, Montréal
<https://www.youtube.com/watch?v=n2Kx0Pb6s9U>
 25/12/2021 World of Antiquity Youtube Channel. Who domesticated the horse?
<https://www.youtube.com/watch?v=HwQQM6NvKsG&t=2463s>
 26/10/2021 L'ADN des fossiles, une machine à remonter dans le temps. AFIS.
<https://www.youtube.com/watch?v=6x1-cH8chMw>
 15/09/2021 XXVIèmes Estivales de Malepère, Arzens. Voyager dans le temps avec l'ADN fossile
<https://www.youtube.com/watch?v=nIvm9Q214pE>
 20/05/2021 Festival L'Histoire à Venir. L'ADN dans tous ses états
<https://www.youtube.com/watch?v=xu6HjB33HLE&feature=youtu.be>
 14/05/2019 Les grands séminaires de l'Observatoire Midi-Pyrénées. L'origine et l'impact du cheval dans l'histoire de l'humanité, Toulouse
https://www.youtube.com/watch?v=ztXD_JPQcFE

Cover pictures of 18 Scientific Journals:

- 2014, 2018, 2022, 2023: Science (3)
- 2014, 2015, 2019: Cell (3)
- 2010, 2011, 2021: Nature (3)
- 2015: Nat Rev Genet (1)
- 2014, 2015: PNAS (2)
- 2014: Genome Res (1)
- 2016: Genetics (1)
- Mol Ecol (2)
- Mol Ecol Res (2)