

# CURRICULUM VITAE

## Fernando Rodriguez, Ph.D.

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### Education and Postdoctoral Training

2010 - 2015	Postdoctoral position Advisor: Irina Arkhipova	Marine Biological Laboratory
2004 - 2009	PhD, Biology, Molecular Biology and Biochemistry Program Advisors: Ana Dominguez Sanjurjo and Trinidad Perez Mendez	Universidad de Oviedo (Spain)
1998 - 2002	BS, Biology	Universidad de Oviedo (Spain)

### Professional Positions

2018 -	Research Scientist	Josephine Bay Paul Center, MBL
2015 - 2018	Research Associate	Josephine Bay Paul Center, MBL
2010 - 2015	Postdoctoral position	Josephine Bay Paul Center, MBL
2004 - 2009	Research assistant	Universidad de Oviedo (Spain)

### Teaching

2008 Lecturer (invited speaker) in MSc Courses, Universidad de Oviedo

2005 Summer Course "Conservation and genetic characterization of plant resources", Universidad de Oviedo

### Research Mentoring

2010- Graduate student supervision. Anupriya Dutta, Brown University.  
2012

- 2013 Undergraduate student supervision. Daniel DiCorpo, Brown University.
- 2014 Undergraduate student supervision. Aubrey W. Kenefick, Williams College.
- 2015 Undergraduate student supervision. Tatsiana Mello, Wellesley College.
- 2016 Undergraduate student supervision. Samantha Spear, Brown University; Brandon M. Le, Brown University; Vishok Srikanth, University of Chicago.
- 2017 Undergraduate student supervision. Jonathan N. Dow, Brown University; Brandon M. Le, Brown University; Katherine Dunham, Brown University; Laura Swain, University of Chicago
- 2018 Undergraduate student supervision. Bria Metzger, Brown University
- 2019 Undergraduate student supervision. Samuel Maffa, Brown University
- 2020 Undergraduate student supervision. Bridget Beaudoin, University of Massachusetts; Matthew Dunn, University of Massachusetts
- 2021 Undergraduate student supervision. Ahmad Alkhatin, Brown University; Anton Tarazi, Brown University

## Training Record

- 2010 - Postdoctoral research position Marine Biological Laboratory
- 2015 Projects:
- Mobile genetic elements in sexual and ancient asexual taxa
  - Reverse transcriptase-related genes and their biological significance
  - Horizontal gene transfer as a source of evolutionary innovation in metazoans
- 2004 - Graduate Research Assistant Universidad de Oviedo (Spain)
- 2009 Project: Ternera Asturiana Beef Traceability based on DNA fingerprinting
- 2004 - PhD fellow
- 2009 Project: Phylogeography and evolutionary history in genus *Rupicapra* based on mitochondrial DNA Universidad de Oviedo (Spain)
- 2002- Msc in Biology
- 2004 Project: Evolution of mitochondrial cytochrome b gene and its corresponding nuclear pseudogene in the chamois (*Rupicapra* spp.). Universidad de Oviedo (Spain)

## Workshops attended

- 2013 - Writing about Science for the Public: A Hands-On Workshop for Scientists. Woods Hole, MA, USA.

2013 - 2013 GMOD Summer School. NESCent. Durham, NC, USA.  
2013 - Statistical Analysis and Graphics with R. MBL. Woods Hole, MA, USA.  
2011 - CCV Bioinformatics Workshop. Brown University, RI, USA.  
2011 - Genome Assembly Special Forces Workshop. Brown University, RI, USA.  
2010 - Next-Generation Sequencing Data Analysis. Brown University, RI, USA.  
2010 - Programmatic Access to Biological Databases (Perl). EMBL-EBI. Hinxton, UK.

## **Publications** (PDF copies available at <https://rodriguezf.org/cv>)

### Original Research in Peer-Reviewed Journals

**Fernando Rodriguez**, Irina A. Yushenova, Daniel DiCorpo, Irina R. Arkhipova. (2022). Bacterial N4-methylcytosine as an epigenetic mark in eukaryotic DNA. *Nature Communications* (Accepted with minor). InReview.

Ruslan Kalendar, Francois Sabot, **Fernando Rodriguez**, Karine Alix, Lucia Natali and Gennady I. Karlov. (2021). Editorial: Mobile Elements and Plant Genome Evolution, Comparative Analyses, and Computational Tools. *Frontiers in plant science* vol. 12 735134. Pubmed.

Rory J. Craig, Irina A. Yushenova, **Fernando Rodriguez**, Irina R. Arkhipova. (2021). An Ancient Clade of Penelope-Like Retroelements with Permuted Domains Is Present in the Green Lineage and Protists, and Dominates Many Invertebrate Genomes. *Molecular Biology and Evolution*. Oct 27;38(11):5005-5020. Pubmed.

**Fernando Rodriguez**, Isa Schön, Matthew Dunn, Koen Martens, Michael Shribak, Irina R. Arkhipova. (2021). A Survey of Transposon Landscapes in the Putative Ancient Asexual Ostracod *Darwinula stevensoni*. *Genes*, 12(3), 401. Pubmed.

Reuben W Nowell, Christopher G Wilson, Pedro Almeida, Philipp H Schiffer, Diego Fontaneto, Lutz Becks, **Fernando Rodriguez**, Irina R Arkhipova, Timothy G Barraclough. (2021). Evolutionary dynamics of transposable elements in bdelloid rotifers. *Elife* Feb 5;10:e63194. Pubmed.

Olga A. Vakhrusheva, Elena A. Mnatsakanova, Yan R. Galimov, Tatiana V. Neretina, Evgeny S. Gerasimov, Sergey A. Naumenko, Svetlana G. Ozerova, Arthur O. Zalevsky, Irina A. Yushenova, **Fernando Rodriguez**, Irina R. Arkhipova, Aleksey A. Penin, Maria D. Logacheva, Georgii A. Bazykin & Alexey S. Kondrashov. (2020). Genomic signatures of recombination in a natural population of the bdelloid rotifer *Adineta vaga*. *Nature Communications* volume 11, Article number: 6421. Pubmed.

Artem V. Nedoluzhko, Fedor S. Sharko, Brandon M. Lê, Svetlana V. Tsygankova, Eugenia S. Boulygina, Sergey M. Rastorguev, Alexey S. Sokolov, **Fernando Rodriguez**, Alexander M. Mazur, Alexey A. Polilov, Richard Benton, Michael B. Evgen'ev, Irina R. Arkhipova, Egor B. Prokhortchouk, Konstantin G. Skryabin1. (2019). A partial genome assembly of the miniature parasitoid wasp, *Megaphragma amalphantum*. *PLOS ONE* Dec 23;14(12):e0226485. Pubmed.

**Fernando Rodriguez** and Irina R. Arkhipova. Transposable elements and polyploid evolution in animals (2018). *Current Opinion in Genetics & Development*. 49:115-123. Pubmed.

Pérez T, **Rodriguez F**, Fernández M, Albornoz J, Domínguez A. Ancient mitochondrial pseudogenes reveal hybridization between distant lineages in the evolution of the *Rupicapra* genus. (2017). *Gene*. 1119(17):30546-2. Pubmed.

Arkhipova IR, Yushenova IA, **Rodriguez F**. (2017) Giant reverse transcriptase-encoding transposable elements at telomeres. *Mol Biol Evol*. 34(9):2245-2257. Pubmed.

**Rodriguez F**, Kenefick AW, Arkhipova IR. LTR-Retrotransposons from Bdelloid Rotifers Capture Additional ORFs Shared between Highly Diverse Retroelement Types.(2017). *Viruses*. 11;9(4). Pubmed.

**Rodriguez F**, Arkhipova I. (2016). Multitasking of the piRNA Silencing Machinery: Targeting Transposable Elements and Foreign Genes in the Bdelloid Rotifer *Adineta vaga*. *Genetics*. 203(1):255-268. Pubmed. Selected article in *Genetics Spotlight 2016*.

Arkhipova IR, Yushenova IA, **Rodriguez F**. (2013). Endonuclease-containing Penelope retrotransposons in the bdelloid rotifer *Adineta vaga* exhibit unusual structural features and play a role in expansion of host gene families. *Mobile DNA*. 4:19. Pubmed.

Flot JF, Hespels B, Li X, Noel B, Arkhipova I, Danchin EG, Hejnol A, Henrissat B, Koszul R, Aury JM, Barbe V, Barthélémy RM, Bast J, Bazykin GA, Chabrol O, Couloux A, Da Rocha M, Da Silva C, Gladyshev E, Gouret P, Hallatschek O, Hecox-Lea B, Labadie K, Lejeune B, Piskurek O, Poulain J, **Rodriguez F**, Ryan JF, Vakhrusheva OA, Wajnberg E, Wirth B, Yushenova I, Kellis M, Kondrashov AS, Mark Welch DB, Pontarotti P, Weissenbach J, Wincker P, Jaillon O, Van Doninck K.(2013). Genomic evidence for ameiotic evolution in the bdelloid rotifer *Adineta vaga*. *Nature*. 500:453-457. Pubmed.

Arkhipova IR, **Rodriguez F**. (2013). Genetic and epigenetic changes involving (retro)transposons in animal hybrids and polyploids. *Cytogenet Genome Res*. 140: 295-311. Pubmed.

**Rodriguez F**, Pérez T, Hammer S, Albornoz J, Domínguez A. (2010). Integrating phylogeographic patterns of microsatellite and mtDNA divergence to infer the evolutionary history of chamois (genus *Rupicapra*). *BMC Evolutionary Biology*. 10:222. Pubmed.

**Rodriguez F**, Hammer S, Pérez T, Suchentrunk F, Lorenzini R, Michallet J, Martinkova N, Albornoz J, Domínguez A. (2009). Cytochrome b phylogeography of chamois (*Rupicapra* spp.). Population contractions, expansions and hybridizations governed the diversification of the genus. *Journal of heredity*. 100: 47-55. Pubmed.

**Rodriguez F**, Albornoz J, Domínguez A. (2007). Cytochrome b pseudogene originated from a highly divergent mitochondrial lineage in genus *Rupicapra*. *Journal of Heredity*. 98: 243-249. Pubmed.

## Reviews, Articles, Books, Book Chapters

**Rodríguez F**, Arkhipova I. Multitasking of the piRNA Silencing Machinery: Targeting Transposable Elements and Foreign Genes in the Bdelloid Rotifer *Adineta vaga*. Genetics Spotlight 2016.

Ana Domínguez Sanjurjo , **Fernando Rodríguez Vazquez**, Jesús Albornoz Pons, Trinidad Pérez Méndez. Book Chapter: El rebeco cantábrico, filogeografía e historia evolutiva. In: El Rebeco Cantábrico (*Rupicapra pyrenaica parva*), "Conservación y gestión de sus poblaciones". Edited by Pérez-Barbería, F.J. & Palacios, B. Colección Naturaleza y Parques Nacionales. Serie Técnica. 2009.

**Rodríguez F**, Hammer S, Pérez T, Suchentrunk F, Lorenzini R, Michallet J, Martinkova N, Albornoz J, Domínguez A. (2008). Cytochrome b phylogeography of chamois (*Rupicapra* spp.): Population contractions, expansions and hybridizations characterize the diversification of the genus. 82nd Annual Meeting of the German Society of Mammalogy. Vienna, 14-18 September 2008. Mammalian Biology. 73 [Suppl. 1]: 16.

Domínguez, A. and **Rodríguez, F.** (2004). Beef traceability based on DNA fingerprinting. Feedinfo News Service.

## In prep

**Rodríguez F**, Arkhipova I. Phylogenetic classification and bioinformatic detection of TEs . In "Transposable elements: methods and protocols" for the series Methods in Molecular Biology. Springer Nature.

Hugo Darras, Natalia de Souza Araujo, Lyam Baudry, Nadège Guiglielmoni, Pedro Lorite, Martial Marbouty, **Fernando Rodríguez**, Irina Arkhipova, Romain Koszul, Jean-François Flot, Serge Aron. Chromosome-level genome assembly and annotation of two lineages of the ant *Cataglyphis hispanica*: steppingstones towards genomic studies of hybridogenesis and thermal adaptation in desert ants. Preprint.

## Meetings and Conferences Presentations (summary-all)

TITLE: An ancient clade of Penelope-like retroelements with permuted domains is present in many invertebrate genomes with exceptionally high copy numbers.

AUTHORS: **Rodríguez F**, Craig R, Yushenova I, Arkhipova I.

The Mobile DNA Conference (FASEB), virtual, 2021.

TITLE: Non-canonical epigenetic system of bacterial origin in aquatic micro-invertebrates.

AUTHORS: **Rodríguez F**, Yushenova I, Arkhipova I.

National Shellfisheries Association 113 annual Meeting, virtual, 2021.

TITLE: Transposon Landscapes in the Putative Ancient Asexual Ostracod *Darwinula stevensoni*.

AUTHORS: **Rodríguez F**, Schön I, Dunn M, Martens K, Shribak M, Arkhipova I.

4th Uppsala Transposon Symposium, virtual, 2020.

TITLE: Non-canonical epigenetic system of bacterial origin in aquatic micro-invertebrates.

AUTHORS: **Rodriguez F**, Yushenova I, Arkhipova I.

National Shellfisheries Association 112 annual Meeting (canceled due to COVID-19), Baltimore, MD, USA, 2020.

TITLE: Non-canonical base modifications of bacterial origin in a eukaryotic genome.

AUTHORS: **Rodriguez F**, Yushenova I, Arkhipova I.

The Mobile DNA Conference (FASEB), Palm Springs, CA, USA, 2019.

TITLE: Transposon silencing and non-canonical base modifications of bacterial origin in a eukaryotes.

AUTHORS: **Rodriguez F**, Yushenova I, Arkhipova I.

Mobile Genetic Elements in Woods Hole, MA, USA, 2019.

TITLE: The epigenetic landscape in the bdelloid rotifer *Adineta*.

AUTHORS: **Rodriguez F**, Arkhipova I.

Transposable Elements, CSHL, Cold Spring Harbor, NY, USA, 2018.

TITLE: The epigenetic landscape in the bdelloid rotifer *Adineta*.

AUTHORS: **Rodriguez F**, Arkhipova I.

GIGA III, Global Invertebrate Genomics Alliance, Curacao, 2018.

TITLE: N6-methyladenine and N4-methylcytosine: amino-methylation as an epigenetic mark in rotifers.

AUTHORS: **Rodriguez F**, Arkhipova I.

Mobile Genetic Elements in Woods Hole, MA, USA, 2017.

TITLE: N6-methyladenine and N4-methylcytosine base modifications are broadly distributed in the bdelloid *rotifer Adineta*.

AUTHORS: **Rodriguez F**, Arkhipova I.

Transposable Elements, CSHL, Cold Spring Harbor, NY, USA, 2016.

TITLE: Transposable elements in the bdelloid rotifer *Adineta vaga*: how to invite them to a party but not let them spoil it.

AUTHORS: **Rodriguez F**, Arkhipova I.

Mobile Genetic Elements in Woods Hole, MA, USA, 2015.

TITLE: Phylogenetic relationships in diverse superfamilies of eukaryotic transposable elements.

AUTHORS: Arkhipova IR, Yushenova IA, **Rodriguez F**.

Contributions to the 4th Moscow International Conference "Molecular Phylogenetics" (MolPhy-4). Moscow, Russia, 2014.

TITLE: Diversified coding potential of retroelements from bdelloid rotifers reveals multiple links to the viral world.  
AUTHORS: Arkhipova IR, Yushenova IA, **Rodriguez F**.  
Abstracts, Keystone Symposium "Mobile Genetic Elements and Genome Evolution", Santa Fe, NM, USA, 2014.

TITLE: piRNA-mediated silencing in the bdelloid rotifer *Adineta vaga* targets transposons as well as genes of foreign origin.  
AUTHORS: **Rodriguez F**, Arkhipova I.  
Regional Meeting on Mobile Genetic Elements, CSHL, Cold Spring Harbor, NY, USA, 2013.

TITLE: Loss of let-7 and miR-100 and possible compensation through editing of miR-125.  
AUTHORS: Dutta A, **Rodriguez F**, Sperling EA, Peterson KJ, Mark Welch DB.  
The Biology of Post-Transcriptional Gene Regulation, Gordon Research Conference, Newport, RI, USA, 2012.

TITLE: Use of phylogenetic approaches to study horizontal gene transfer and evolutionary history of gene families.  
AUTHORS: Gladyshev EA, **Rodriguez F**, Yushenova IA, Arkhipova IR.  
3rd Moscow International Conference Molecular Phylogenetics, Moscow, Russia, 2012.

TITLE: An increase in relative abundance of pi-like RNAs in response to ionizing radiation in the bdelloid rotifer *Adineta vaga*.  
AUTHORS: **Rodriguez F**, Arkhipova I.  
Genomic Impact of Eukaryotic Transposable Elements, Asilomar, CA, USA, 2012.

TITLE: Initial characterization of PIWI-interacting RNAs in *Adineta vaga*.  
AUTHORS: **Rodriguez F**, Arkhipova I.  
North East Mobile Genetic Element Meeting, Woods Hole, MA, USA, 2011.

TITLE: Microsatellite and mt-DNA phylogenies of the chamois (genus *Rupicapra*) and taxonomic implications.  
AUTHORS: **Rodriguez F**, Pérez T, Hammer S, Albornoz J, Domínguez A.  
V World Conference on Mountain Ungulates, Granada, Spain, 2009.

TITLE: Diversification of the chamois (genus *Rupicapra*). Discordance between microsatellite and mt-DNA phylogenies.  
AUTHORS: **Rodriguez F**, Pérez T, Hammer S, Albornoz J, Domínguez A.  
XII Congress European Society for Evolutionary Biology, Turin, Italy, 2009

TITLE: Filogeografía y diversificación del género *Rupicapra*.  
AUTHORS: **Rodriguez F**, Hammer S, Pérez T, Suchentrunk F, Lorenzini R, Michallet J, Martinkova N,

Albornoz J, Domínguez A.

XVII Seminario de Genética de Poblaciones y Evolución, Ribadesella, Spain, 2008.

TITLE: Cytochrome b Phylogeography of Chamois (*Rupicapra* spp.): Population Contractions, Expansions and Hybridizations characterize the Diversification of the Genus.

AUTHORS: **Rodríguez F**, Hammer S, Pérez T, Suchentrunk F, Lorenzini R, Michallet J, Albornoz J, Domínguez A.

82nd Annual meeting of the German Society of Mammalogy, Vienna, Austria, 2008.

TITLE: Filogeografía mitocondrial del rebeco (*Rupicapra* spp.) basada en el citocromo b.

AUTHORS: **Rodríguez F**, Hammer S, Pérez T, Suchentrunk F, Lorenzini R, Michallet J, Albornoz J, Domínguez A.

XXXVI Congreso de la Sociedad Española de genética, León, Spain, 2007.

TITLE: Mitochondrial Phylogeography of chamois (*Rupicapra* spp.) based on cytb.

AUTHORS: **Rodríguez F**, Hammer S Pérez T, Suchentrunk F, Lorenzini R, Michallet J, Albornoz J, Domínguez A.

XI Congress European Society for Evolutionary Biology, Uppsala, Sweden, 2007.

TITLE: Evolución del gen citocromo b y su correspondiente pseudogen nuclear en el rebeco (*Rupicapra* spp.).

AUTHORS: **Rodríguez F**, Albornoz J, Domínguez A.

XXXV Congreso de la Sociedad Española de genética, Almería, Spain, 2005.

## **Professional Service and Memberships**

### Invited Reviewer for:

BMC Plant Biology journal, PeerJ, Molecular Biology and Evolution, Scientific Reports , Frontiers in Microbiology, Nucleid Acid Research, Mobile DNA. (<https://publons.com/a/1320478>).

### Invited Guest Associate Editor for:

-Frontiers in Plant Systems and Synthetic Biology (Research topic: Mobile Elements and Plant Genome Evolution, Comparative Analyzes and Computational Tools).

-Genes (Basel).

### Memberships:

- The Genetics Society of America. 2010 – present.



- AAAS/Science membership. Full membership in AAAS (the American Association for the Advancement of Science) sponsored by AAAS/Science Program for Excellence in Science (2 years full membership). 2015 – present.
- The Marine Biological Laboratory (MBL) Society. 2018 – present.
- The Global Invertebrate Genomics Alliance (GIGA). 2018 – present.
- The National Shellfisheries Association. 2020 – present.