

Beatriz M. Navarro Domínguez

Education

University

- 2012-2016 **Ph.D. in Fundamentals and Systems Biology** Thesis title: *Gene expression changes associated to the presence of B chromosomes in the grasshopper Eyprepocnemis plorans (t.t).* Distinctions: *Cum Laude*, International Recognition. Supervisors: Dr. María Dolores López-León, Dr. Juan Pedro M. Camacho and Dr. Josefa Cabrero Hurtado. Department of Genetics, Universidad de Granada, 18010 Granada, Spain.
- 2010-2011 **M.Sc. in Genetics and Evolution** Thesis title: *Preliminary research on the relationship of Hsp70 and B chromosomes in Eyprepocnemis plorans (t.t).* Advisor: María Dolores López-León. Department of Genetics, Universidad de Granada, 18010 Granada, Spain.
- 2003-2009 **B. Sc. in Biology** University of Granada, 18010 Granada, (Spain).

Specialization courses

- 2012 **Perl programming. XII Edition.** Universidad de Granada, Granada, Spain.
- 2013-2014 **V Beginner Teaching Training and Improvement of Teaching Program** Universidad de Granada, Granada, Spain.

Professional career

Current Position

- 2018-present **Postdoctoral Research Associate** *Evolutionary genomics of the Segregation Distorter complex of Drosophila melanogaster.* PIs: Dr. Daven Presgraves and Dr. Amanda Larracunte. Department of Biology, University of Rochester. Rochester, New York 14627 (USA).

Previous Positions

- 2017-2018 **Postdoctoral Research Associate** *Evolution of Dosage Compensation - An empirical test using turtles with independently evolved XX/XY and ZZ/ZW chromosomes.* PI: Dr. Nicole Valenzuela. Department of Ecology, Evolution, and Organismal Biology. Iowa State University. Ames, Iowa 50011 (USA).
- 2015 **Research Assistant** *Genetic control of alternation of generations in ferns (t.t).* PI: Dr. Manuel A. Garrido Ramos. Departamento de Genética Universidad de Granada. Departamento de Genética, Universidad de Granada. 18010 Granada (Spain)..

Fellowship, grants and awards

- 2012 **International FPI mobility grant, Government of Spain** *High throughput analysis of gene expression: Microarray hybridization and data analysis*. PI: Dr. Timothy F. Sharbel. Dept. of Cytogenetics and Genome Analysis Leibniz Institute of Plant Genetics and Crop Plant Research, Gatersleben, Germany.
- 2010-2014 **Predoctoral Fellowship FPI, Government of Spain** *Unveiling the cross-talk between A and B chromosomes in the grasshopper *Eyprepocnemis plorans**. PI: Dr. Josefa Cabrero Hurtado. Departamento de Genética, Universidad de Granada. 18010 Granada (Spain)..

Collaborations

- 2016-2017 **Collaborator** *Genetic engineering as a tool for the study of the evolution of the color vision* (translated title, t.t.). PI: Dr. Miguel A. Rodríguez-Gironés. Department of Functional and Evolutionary Ecology. Estación Experimental de Zonas Áridas, CSIC. Almería (Spain).

Laboratory and bioinformatic skills

Informatics

- Operating Systems: GNU/Linux, MacOS, Windows
- Text processing: MS Word, LO Writer, Google Docs, LyX, Latex
- Spreadsheets: MS Excel, LO Calc, Gnumeric, Google Sheets
- Presentations: MS Powerpoint, LO Impress, Latex Beamer, Google Slides
- Graphic Design: Photoshop, Illustrator, Gimp, Inkscape

Data analysis and visualization

- Data Analysis: SPSS, R
- Data Visualization: R (ggplot2)
- Approximate Bayesian Computation (ABC)

Programming

- R, Bash, Perl, Python

NGS analysis

- Short-read mapping: SSAHA2, BWA, Samtools, Bowtie, Bowtie2, STAR
- Transcriptome assembly: Trinity, ABySS, TransABySS
- Repetitive DNA: RepeatExplorer, RepeatMasker, McClintock
- SNP calling and annotation: GATK, Samtools, SNPeff, VCFtools, BCFtools
- Population genomics: PopGenome, LEA, SweepFinder
- Recombination and LD: Plink, HapMap
- Genome alignment: LASTZ, LAST, Multiz, Mauve
- Comparative genomics: PHAST, Circos

Molecular biology

- Nucleic acids extraction (DNA, RNA, small RNA)
- PCR
- Molecular cloning
- Gene expression measurement: retrotranscription, relative quantification by qPCR and qRT-PCR
- Estimation of gene copy number in the genome: absolute quantification by qPCR

- Gene knockdown by means of RNA interference

Cytogenetics

- C-Banding
- FISH (Fluorescence In Situ Hybridization)
- Immunofluorescence

Primary Cell Culture

- Attached fibroblasts primary cell culture.

Publications

Peer-reviewed articles

- 2020 Lee LS*, **Navarro-Domínguez B***, Wu Z , Montiel EE, Badenhorst D, Gessler TB, Bista B & Valenzuela N. *Karyotypic evolution of Sauropsid vertebrates illuminated by optical and physical mapping of the painted turtle and slider turtle genomes*. *Genes*, 11(8), 928 (2020). *Contributed equally as first authors. ([view at publisher](#)).
- 2019 Lee LS, Montiel EE, **Navarro-Domínguez B**, Valenzuela N. *Chromosomal rearrangements during turtle evolution altered the synteny of genes involved in vertebrate sex determination*. *Cytogenetic and genome research*, 157(1-2), 77-88 (2019) ([view at publisher](#)).
- 2019 Ruiz-Ruano FJ, **Navarro-Domínguez B**, Camacho JPM, Garrido-Ramos MA. *Characterization of the satellitome in lower vascular plants: the case of the endangered fern Vandenboschia speciosa*. *Annals of Botany* 123(4), 587–599 (2019) ([view at publisher](#)).
- 2019 Ruiz-Ruano FJ, **Navarro-Domínguez B**, Camacho JPM, Garrido-Ramos MA. *Full plastome sequence in the fern Vandenboschia speciosa (Hymenophyllales): structural singularities and evolutionary insights*. *Journal of Plant Research* 132, 3–17 (2019) ([view at publisher](#)).
- 2019 **Navarro-Domínguez B**, Martín-Peciña M, Ruíz-Ruano FJ, Cabrero J, Corral JM, López-León MD, Sharbel TF & Camacho JPM. *Gene expression changes elicited by a parasitic B chromosome in the grasshopper Eyprepocnemis plorans are consistent with its phenotypic effects*. *Chromosoma* 128, 53–67 (2019). ([view at publisher](#)).
- 2017 **Navarro-Domínguez B**, Ruíz-Ruano FJ, Camacho JPM, Cabrero J & López-León MD. *Transcription of a B chromosome CAP-G pseudogene does not influence normal Condensin Complex genes in a grasshopper*. *Scientific Reports* 7, 17650 (2017) ([view at publisher](#)).
- 2017 **Navarro-Domínguez B**, Ruíz-Ruano FJ, Cabrero J, Corral JM, López-León MD, Sharbel TF & Camacho JPM. *Protein-coding genes in B chromosomes of the grasshopper Eyprepocnemis plorans*. *Scientific Reports* 7, 45200 (2017) ([view at publisher](#)).
- 2016 **Navarro-Domínguez B**, Cabrero J, Camacho JPM & López-León MD. *B-chromosome effects on Hsp70 gene expression does not occur at transcriptional level in the grasshopper Eyprepocnemis plorans*. *Molecular Genetics and Genomics*, 291(5), 1909-1917 (2016) ([view at publisher](#)).

- 2013 Cabrero J, Bakkali M, **Navarro-Domínguez B**, Ruíz-Ruano FJ, Martín-Blázquez R, López-León MD & Camacho JPM. 2013. *The Ku70 DNA-repair protein is involved in centromere function in a grasshopper species*. *Chromosome Research* 21(4), 393-406 (2013) ([view at publisher](#)).

Preprints and articles in preparation

- Ruiz-Ruano FJ, **Navarro-Domínguez B**, López-León MD, Cabrero J & Camacho JPM. *Evolutionary success of a parasitic B chromosome rests on gene content*. BioRxiv, 683417 ([view at bioRxiv](#)).
- Ruiz-Ruano FJ, **Navarro-Domínguez B**, Camacho JPM & Garrido-Ramos MA. *Most DNA sequences in the genome of the fern *Vandenboschia speciosa* are transposable elements*. Under Review in Genes.
- **Navarro-Domínguez B**, Brand CL, Chang CH, Muirhead CA, Presgraves DC & Larracuente A. *Evolutionary genomics of the Segregation Distorter supergene: drive, recombination and genetic load*. In preparation.

Publishing

- 2020 Preprint editorial team of *Proceedings of the Royal Society of London B*.
2020 Reviewer for *Molecular Ecology*.

Conferences and seminars

Talks

- 2019 *Evolutionary genomics of the Segregation Distorter gene complex*, Evolution, Ecology, Genetics and Genomics Seminar (E2G2). Rochester, NY (USA).
2019 *Population genomics of the selfish Segregation Distorter gene complex reveals the interaction of drive, recombination, and genetic load*, GLAM-Evogen. Buffalo, NY (USA).
2016 *B chromosomes contain protein-coding genes, and they are expressed! (t.t.)*, IX Seminario de Citogenética de la Sociedad Española de Genética, Toledo (Spain).
2014 *Gene expression changes associated to the presence of B chromosomes in *Eyprepocnemis plorans* (t.t.)*, VIII Seminario de Citogenética de la Sociedad Española de Genética, Alcalá de Henares (Spain).
2014 *Transcriptome and microarray analysis of B chromosome effects on gene expression in two populations of *Eyprepocnemis plorans* (t.t.)*, 3rd B-Chromosome Conference. Gatersleben (Germany).

Posters

- 2016 *Gene expression changes associated to an intragenome parasitism (t.t.)*, V Congreso de la Sociedad Española de Biología Evolutiva. Murcia (Spain), 18-21th January.
2014 *Analysis of B chromosome effects on gene expression by means of Illumina transcriptome sequencing*, 3rd B-Chromosome Conference. Gatersleben (Germany).

Others

- 2014 Organizer (student) XX Seminar of Population Genetics and Evolution (t.t.), Sociedad Española de Genética.

- 2014 Chair at the 3rd B-Chromosome Conference. 5th session: *Novel analysis methods and applications of B chromosomes*, Gatersleben, Germany.

Teaching and outreach

Lecturing

- 2013-2014 Practicum in Genetics II. Departament of Genetics, Biology, Universidad de Granada.
- 2013-2014 Practicum in Evolutionary Biology. Departament of Genetics, Biology, Universidad de Granada.
- 2012-2013 Practicum in Genetics II. Departament of Genetics, Biology, Universidad de Granada.
- 2012-2013 Practicum in Evolutionary Biology. Departament of Genetics, Biology, Universidad de Granada.

Mentoring

- 2018 PhD Rotation Student, IGG program. Zainab Riaz. *Immunodetection of DNA methylation in turtle chromosomes*, Department of Ecology, Evolution, and Organismal Biology. Iowa State University, Ames, Iowa.
- 2016-2017 Masters student supervision (Master in Genetics and Evolution Program, University of Granada). Juan Muñoz Checa. *Determination of the spatial expression pattern of the opsins in the visual system of Bombus terrestris (t.t.)*, Department of Functional and Evolutionary Ecology. Estacion Experimental de Zonas Áridas, CSIC., Almería, Spain.

Outreach

- 2015 Workshop on XVIII Science Fair: Genetics: a thousand faces of inheritance (t.t.). Parque de las Ciencias (Science Museum), Granada, Spain.
- 2015 XV Week of Science (t.t.). Departamento de Genética, Universidad de Granada. Guidance of highschool students interested in scientific careers, Granada, Spain.
- 2014 XIV Week of Science (t.t.). Departamento de Genética. Guidance of highschool students interested in scientific careers, Granada, Spain.
- 2013 Workshop on XVI Science Fair: Genetics: a thousand faces of inheritance (t.t.). Parque de las Ciencias (Science Museum), Granada, Spain.
- 2013 XIII Week of the Science (t.t.). Departamento de Genética. Guidance of highschool students interested in scientific careers, Granada, Spain.
- 2012 Workshop on XV Science Fair: *Genetics: two faces of inheritance (t. t.)*, Parque de las Ciencias (Science Museum).
- 2012 XII Week of Science (t.t.). Departamento de Genética. Guidance of highschool students interested in scientific careers, Granada.
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