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Current position

Associate Professor, Technical University of Madrid (UPM).

Areas of specialization

Genomic-assisted breeding • Predictive Breeding • Plant breeding • Quantitative genetics • Statistical genomics • Cereals • Plant Biology

Appointments held

2025–Current Associate Professor, UPM.
Dec 2024 Researcher, Centre for Plant Biotechnology and Genomics (CBGP).
2020–2024 Senior Beatriz Galindo (Distinguished Researcher), CBGP–UPM.
2015–2020 Lecturer, University College Dublin (UCD).
Jun 2015 Postdoctoral Fellow, Cornell University, USA.
2011–2012 Postdoctoral Fellow, Natural Sciences and Engineering Research Council of Canada (NSERC).
2009–2011 Postdoctoral Fellow, SPARC Centre, Saskatchewan, Canada.
2007–2008 Research Technician, CSIC, Armilla, Granada, Spain.
2003–2007 Doctoral studies, University of Granada.

Education

2017 Professional Teaching Certificate & Continuing Professional Development Certificate, University College Dublin.
2015 M.Sc. in Plant Breeding, Cornell University (USA).
2008 Ph.D. in Crop Physiology, University of Granada (Spain).
2005 M.Sc. in Agrobiology, University of Granada (Spain).
2001 B.Sc. in Biology, University of Seville (Spain).

Research grants and projects

2025–2028 **European Grant: DADR-2024-029390, Breed-E-Omics**. *Approche génomique d'un projet Épeautre pour une agriculture durable face au réchauffement climatique. €96K.*

2025–2027 **Spanish Grant: Consolidation 2024**. *Combining genomic approaches to study host–pathogen relationships in wheat and Septoria.* Ref: CNS2024-154812. *€144K.*

2022–2025 **Spanish Grant: Proyectos de Generación de Conocimiento 2021**. *Mejora asistida por genómica para la agricultura sostenible: Un enfoque de referencia* (PID2021-123718OB-I00). *€127K.*

2022–2026 **Spanish Grant: UPM-PhD Plan Propio PREDOC-21-GCCS6G-62-2B65BK**. *Machine learning approaches applied to genomic-assisted breeding* (DOI). *€74K.*

2022 **Spanish Grant: Industrial Doctorate**. *Aplicación de herramientas de mejora asistida por genómica al programa de mejora de girasol de Syngenta. €25K.*

2021–2024 **Spanish Grant: Strategic Lines**. *WheatRes: Identification of new sources of horizontal resistance to Septoria and rust in durum wheat* (PLEC2021-007930). *€190K.*

2021–2023 **Spanish Grant: Research and Development (Madrid)**. *Breeding tools to harness yield productivity by applying genomic selection. €144K.*

2019–2024 **H2020 European Grant**. *Next generation variety testing for improved cropping on European farmland (InnoVar)* (DOI). *€319K.* Deputy WP2 leader; tasks in WP2, WP3, WP4, WP7.

2020–Current **Spanish Grant: Oat PanGenome**. Consortium to generate a pan-genome for hexaploid oat. *€36K.* Member; responsible for WGS of variety OT380.

2020–Current **Spanish Grant: Svevo Platinum Genome**. Member, international consortium to improve the reference durum wheat variety Svevo. *€10K.*

2020–2023 **Interreg European Grant**. *Healthy Oats – innovation in oat product development.* UCD, IBERS, Swansea University, Teagasc. *€2 million.* Project Coordinators: Julio Isidro Sánchez & Fiona Doohan.

2019–2023 **Spanish Grant**. *Improving the accuracy and efficiency of selection for complex traits in wheat breeding for Mediterranean environments through MAS and GS* (PID2019-109089RB-C32, TRENDING_Wheat). *€165K.* PI: José Miguel Soriano. Role: GS implementation strategy.

2019–2022 **European Grant**. *WheatSustain: Knowledge-driven genomic predictions for sustainable disease resistance in wheat* (DOI). *€174K.* PI; WP1 lead: Julio Isidro-Sánchez.

2017–2022 **Irish Grant**. *CONSUS: Crop Optimisation through Sensing, Understanding & Visualisation. €4 million.* PI: Prof. Gregory O'Hare. Role: Funded Investigator for Ph.D. (*€96K*).

2017–2022 **Irish Grant**. *Oats for the future: deciphering host resistance and RNAi to minimise mycotoxin contamination under present and future climate scenarios. €87K.* PIs: Fiona Doohan, Julio Isidro-Sánchez, Naresh Magan, Ángel Medina.

2019–2022 **Irish Grant**. *Developing multi-use barley to improve the organic Irish market.* Irish Research Council. *€96K.* PI: Julio Isidro-Sánchez.

2018–2020 **European Grant**. *Effect of soil water content on seedling emergence in small-grain cereals.* European Plant Phenotyping Network (EPPN). PI: Julio Isidro-Sánchez.

2016 **Irish Grant**. *PICS: Physiology Infrastructure for Crop Stress. €295K.* PI: Julio Isidro-Sánchez.

2015–2019 **Canadian Grant**. *Canadian Triticum Applied Genomics (CTAG).* Design of genomic selection program. *$10 million.*

2012–2017 **Canadian Grant**. *Improving Wheat Productivity under Conditions of Abiotic Stress* (NRC Wheat Flagship; Canadian Wheat Improvement Consortium). *$14 million.* Postdoctoral project.

2009–2011 **European Grant**. *Identification and selection of traits that maximize biomass production and enhance conversion efficiency for viable biorefineries* (AGRNEX2008N0475). Postdoctoral project.

2002–2006 **European Grant**. *Improving durum wheat for water-use efficiency and yield stability through physiological and molecular approaches (IDuWUE)* (ICFPN502A3PR03; ICA3NCTN2002N10085). *€963K*. Research team member.

2006–2009 **Spanish Grant**. *Nuevas vías para mejorar la adaptación del trigo duro (*Triticum turgidum *L. var.* durum*) a ambientes mediterráneos* (AGL2006-09226-C02-02/AGR). *€45K*. Research team member.

2005–2008 **Spanish Grant**. *Fisiología del tritórdeo en condiciones mediterráneas: enfoque multidisciplinar para una colaboración transmediterránea* (AGL2005-07257-C04-04). *€28K*. Research team member.

2003–2008 **Spanish Grant**. *Aproximación multidisciplinar al incremento de la eficacia en la mejora del trigo duro: integración de técnicas ecofisiológicas y moleculares* (AGL2002-04285-C03-02). *€65K*. Ph.D. project.

Publications & science outreach

Journal articles

2025 Menor de Gaspar, J., Domínguez Rondón, A., García-Abadillo, J., Knox, R., Bokore, F. E., Boyle, K., Ammar, K., Huerta-Espino, J., Beraies, S., Meyer, B., Zhang, W., Cuthbert, R. D., Pierre, F., Ruan, Y., & Isidro y Sánchez, J. (2025). Mapping novel yellow and leaf rust loci and predicting resistance in cross derived Canadian durum wheat. *The Plant Genome* ***IF: 3.9, Q1***. DOI

2025 Fernández-González, J. and **Isidro y Sánchez, J**. Optimizing fully efficient two-stage models for genomic selection using open-source software. *Plant Methods*. **IF: 5.1, Q1**. DOI.

2025 Avni et al. A pangenome and pantranscriptome of hexaploid oats. *Nature*. **IF: 50.5, Q1**. DOI

2025 Wubi et al. Global genomic population structure of wild and cultivated oat reveals signatures of chromosome rearrangements. *Nature Communications*. **IF: 14.7, Q1**. DOI.

2025 Viviani et al. Priority actions for Fusarium head blight resistance in durum wheat: insights from the Wheat Initiative. *The Plant Genome* 18(1):e20539. **IF: 3.9, Q1**. DOI.

2024 Morales, L., Akdemir, D., Girard, A.L., Neumayer, A., Reddy Nannuru, V.K., Shahinnia, F., Stadlmeier, M., Hartl, L., Holzapfel, J., **Isidro Sánchez, J.** and Kempf, H. Leveraging trait and QTL covariates to improve genomic prediction of resistance to Fusarium head blight in Central European winter wheat. *Frontiers in Plant Science*. **IF: 5.8,Q1**. DOI.

2024 López-Fernández, M., Chozas, A., Benavente, E., Alonso-Rueda, E., **Isidro y Sánchez, J.**, Pascual, L. and Giraldo, P. Genome-wide association mapping of end-use gluten properties in bread wheat landraces (*Triticum aestivum* L.). *Journal of Cereal Science*.**IF: 3.9, Q2**. DOI.

2024 García-Abadillo, J., Adunola, P., Aguilar, F.S., Trujillo-Montenegro, J.H., Riascos, J.J., Persa, R., **Isidro y Sánchez, J.** and Jarquín, D. Sparse testing designs for optimizing predictive ability in sugarcane populations. *Frontiers in Plant Science*. **IF: 5.8, Q1**. DOI.

2024 Fanelli Carvalho, H., Rio, S., García-Abadillo, J., **Isidro y Sánchez, J**. Revisiting su-

periority and stability metrics of cultivar performances using genomic data: derivations of new estimators. *Plant Methods*. DOI **IF: 5.1, Q1**.

2024 Abebe, A.A., Åstrand, J., Montesinos-López, O.A., **Isidro-Sánchez, J.**, Fernández-Gónzalez, J., Tadesse, W., Vetukuri, R.R., Carlsson, A.S., Ceplitis, A., Crossa, J., Ortiz, R., Chawade, A. Genomic selection in plant breeding: Key factors shaping two decades of progress. *Molecular Plant*. DOI. **IF: 27.5, Q1**.

2024 Din, A., Gul, R., Khan, H., García-Abadillo Velasco, J., Persa, R., **Isidro y Sánchez, J.**, Jarquín, D. Assessing genotype-by-environment (G×E) interaction in desi chickpea via the Bayesian AMMI model. *Agriculture* 14:215. DOI. **IF: 3.6, Q2**.

2024 García-Abadillo, J., Barba, P., Carvalho, T., Sosa-Zuñiga, V., Lozano, R., Carvalho, H.F., García-Rojas, M., Salazar, E., **Isidro y Sánchez, J**. Dissecting the complex genetic basis of pre- and post-harvest traits in *Vitis vinifera* L. using GWAS. *Horticulture Research*. DOI. **IF: 8.7, Q1**.

2024 Fernández-Gónzalez, J., Haquin, B., Combes, E., Bernard, K., Allard, A., **Isidro y Sánchez, J**. Maximizing efficiency in sunflower breeding through historical data optimization. *Plant Methods*. DOI. **IF: 5.1, Q1**.

2023 Akdemir, D., Somo, M., **Isidro-Sanchéz, J**. An expectation–maximization algorithm for combining a sample of partially overlapping covariance matrices. *Axioms* 12:161. DOI. **IF: 2.6, Q2**.

2022 García-Abadillo, J., Morales, L., Buerstmayr, H., Michel, S., Lillemo, M., Holzapfel, J., Hartl, L., Akdemir, D., Carvalho, H.F., and Isidro-Sánchez, J. Alternative scoring methods for Fusarium head blight resistance in genomic-assisted breeding. *Frontiers in Plant Science*. DOI. **IF: 6.627, Q1**.

2022 Fernández-Gónzalez, J., Akdemir, D., Isidro y Sánchez, J. A comparison of methods for training population optimization in genomic selection. *Theoretical and Applied Genetics*. DOI. **IF: 5.574, Q1**.

2022 Shahinnia, F., **Isidro y Sánchez, J.** et al. Genome-wide association study and genomic prediction of resistance to stripe rust in current Central and Northern European winter wheat germplasm. *Theoretical and Applied Genetics*. DOI. **IF: 5.574, Q1**.

2021 Rio, S., Akdemir, D., **Isidro y Sánchez, J**. Assessment of genomic prediction reliability and optimization of experimental designs in multi-environment trials. *Theoretical and Applied Genetics*. DOI. **IF: 5.574, Q1**.

2021 **Isidro y Sánchez, J.** and Akdemir, D. Training set optimization for sparse phenotyping in genomic selection. *Frontiers in Plant Science* 12:715910. DOI. **IF: 6.627, Q1**.

2021 Rio, S., Gallego-Sánchez, L., Montilla-Bascón, G., Canales, F.J., **Isidro y Sánchez, J.** and Prats, E. Genomic prediction and training set optimization in a structured Mediterranean oat population. *Theoretical and Applied Genetics* 134:3595–3609. DOI. **IF: 5.574, Q1**.

2021 Hilmarsson, H.S., Rio, S., **Isidro y Sánchez, J**. Genotype-by-environment interaction analysis of agronomic spring barley traits in Iceland using AMMI, factorial regression, and linear mixed models. *Agronomy* 11:499. DOI. **IF: 2.650, Q2**.

2021 Akdemir, D., Rio, S., **Isidro y Sánchez, J**. TrainSel: an R package for selection of training populations. *Frontiers in Genetics*. DOI. **IF: 4.772, Q1**.

2020 **Isidro-Sánchez, J.**, D'Arcy Cusack, K., Verheecke-Vaessen, C., Kahla, A., Bekele, W., Doohan, F., Magan, N. and Medina, A. Genome-wide association mapping of *Fusarium langsethiae* infection and mycotoxin accumulation in oat (*Avena sativa* L.). *The Plant Genome* 13(2):e20023. DOI. **IF: 4.089, Q2**.

2020 Akdemir, D., Knox, R., **Isidro-Sánchez, J**. Combining partially overlapping multi-omics data in databases using relationship matrices. *Frontiers in Plant Science* 11:947. DOI. **IF: 5.754, Q1**.

2019 Akdemir, D., **Isidro-Sánchez, J**. Design of training populations for genomic predic-

tion. *Scientific Reports* 9:1446. DOI. **IF: 3.998, Q1**.

2019 Gul, A., Diepenbrock, C., et al., **Isidro-Sánchez, J**. Mark E. Sorrells: Plant breeder, geneticist, innovator, mentor. *Plant Breeding Reviews* 42:1–38. DOI. **IF: 1.662, Q1**.

2019 Akdemir, D., Beavis, W., Fritsche-Neto, R., Singh, A.K., **Isidro-Sánchez, J**. Multi-objective optimized genomic breeding strategies for sustainable food improvement. *Heredity*. DOI. **IF: 3.436, Q1**.

2018 Kumar, S., Knox, R., Singh, A.K., DePauw, R., Campbell, H., **Isidro-Sánchez, J** et al. High-density genetic mapping of a major QTL for resistance to multiple races of loose smut in a tetraploid wheat cross. *PLOS ONE* 13:2. DOI. **IF: 2.776, Q2**.

2017 **Isidro-Sánchez, J.**, Perry, B., Singh, A.K., Wang, H., DePauw, R.M., et al. Effects of seeding rate on durum crop production and physiological responses. *Agronomy Journal* 109:1981–1990. DOI. **IF: 1.897, Q2**.

2017 Akdemir, D., Jannink, J.-L., **Isidro-Sánchez, J**. Locally epistatic models for genome-wide prediction and association by importance sampling. *Genetics Selection Evolution*. DOI. **IF: 3.743, Q1**.

2016 Akdemir, D., **Isidro-Sánchez, J**. Efficient breeding by genomic mating. *Frontiers in Genetics* 7:210. DOI. **IF: 3.789, Q1**.

2015 **Isidro-Sánchez, J.**, Jannink, J.-L., Akdemir, D., Poland, J., Heslot, N., Sorrells, M.E. Training set optimization under population structure in genomic selection. *Theoretical and Applied Genetics* 128(1):145–158. DOI. **IF: 3.900, Q1**.

2015 Akdemir, D., **Isidro-Sánchez, J.**, Jannink, J.-L. Optimization of genomic selection training populations with a genetic algorithm. *Genetics Selection Evolution* 47(1):38. link. **IF: 2.895, Q1**.

2012 **Isidro-Sánchez, J.**, Knox, R., Singh, A.K., Clarke, F.R., Krishna, P., DePauw, R.M., Clarke, J.M., Somers, D. Brassinosteroid leaf unrolling QTL mapping in durum wheat. *Planta* 236(1):273–281. DOI. **IF: 3.347, Q1**.

2012 **Isidro-Sánchez, J.**, Knox, R., Singh, A.K., Clarke, F.R., DePauw, R.M., Clarke, J.M., Somers, D. Quantitative genetic analysis and mapping of leaf angle in durum wheat. *Planta* 236(6):1713–1723. DOI. **IF: 3.347, Q1**.

2011 **Isidro-Sánchez, J.**, Álvaro, F., Royo, C., Villegas, D., Miralles, D., García del Moral, L.F. Changes in the duration of developmental phases of durum wheat caused by breeding in Spain and Italy during the 20th century and its impact on yield. *Annals of Botany* 107(8):1355–1366. DOI. **IF: 4.030, Q1**.

2008 Álvaro, F., **Isidro-Sánchez, J.**, Villegas, D., García del Moral, L.F., Royo, C. Old and modern Italian and Spanish durum wheat varieties differ in spike components. *Field Crops Research*. DOI. **IF: 2.032, Q1**.

2008 Álvaro, F., **Isidro-Sánchez, J.**, Villegas, D., García del Moral, L.F., Royo, C. Breeding effects on grain filling, biomass partitioning and remobilization in Mediterranean durum wheat. *Agronomy Journal*. DOI. **IF: 1.532, Q2**.

2007 Royo, C., Álvaro, F., Martos, V., Ramdani, A., **Isidro-Sánchez, J.**, Villegas, D., García del Moral, L.F. Genetic changes in durum wheat yield components and associated traits in Italy and Spain during the 20th century. *Euphytica*. DOI. **IF: 1.050, Q2**.

Books

2022 **Isidro-Sánchez, J.**, Rio, S., Akdemir, D. "Hands-on training optimization in genomic selection." In *Genomic Selection in Plants: A Guide for Breeders*. CRC Press. ISBN 9781032103501. DOI.

2020 **Isidro-Sánchez, J.**, Prats, E., Howarth, C., Langdon, T., Montilla-Bascón, G. "Genomic approaches for climate-resilience breeding in oats." In *Genomic Designing of*

Climate-Smart Cereal Crops, pp. 133–169. Springer, Cham. DOI.

2017 **Isidro-Sánchez, J.**, Akdemir, D., Montilla-Bascón, G. "Genome-wide association analysis using R in oat." In *Methods and Protocols*. Springer. DOI.

2017 Montilla-Bascón, G., Broeckling, C.D., Hoekenga, O., Prats, E., Sorrells, M., **Isidro-Sánchez, J**. "Chromatographic methods to quantify nutritional components in oat." In *Methods and Protocols*. Springer. DOI.

2016 **Isidro-Sánchez, J.**, Akdemir, D., Burke, J. "Genomic Selection." In *The World Wheat Book*, Vol. III. Lavoisier, Paris. DOI.

Presentations and talks

2025 7th 19th Meeting of the EUCARPIA Section Biometrics in Plant Breeding 2025 *A novel framework to control genetic diversity for optimal genomic mating.* Maetwally S , Fernández-González J, Isidro y Sánchez, J **Speaker**.

2025 7th 19th Meeting of the EUCARPIA Section Biometrics in Plant Breeding 2025 *Why REML variance estimates have no biological meaning and how to solve it.* Fernández-Gonzalez, J., Maetwally S., Isidro y Sánchez, J., **Speaker**.

2025 7th 19th Meeting of the EUCARPIA Section Biometrics in Plant Breeding 2025 *Genetic control of Wheat Flour End-Use Quality and Rheology via Genome-Wide Association Studies.* Menor de Gaspar J, Cuthbert R, Ruan Y, Knox R , Fu BX, Wang K, Sangah J, Berraies S, Meyer B, Bokore F, Isidro y Sánchez J. **Poster**.

2025 7th International Conference of Quantitative Genetics, Vienna, Austria, 22–26 July 2024. "Integrating Host–Pathogen Genomics to Enhance Wheat Resistance Against *Septoria tritici* Blotch." Domínguez Rondón, A., Isidro y Sánchez, J., Sánchez-Vallet, A. **Poster**.

2024 7th International Conference of Quantitative Genetics, Vienna, Austria, 22–26 July 2024. "Integrating Host–Pathogen Genomics to Enhance Wheat Resistance Against *Septoria tritici* Blotch." Domínguez Rondón, A., Isidro y Sánchez, J., Sánchez-Vallet, A. **Poster**.

2024 7th International Conference of Quantitative Genetics, Vienna, Austria, 22–26 July 2024. "Empirical insights into training set optimization for AAFC's wheat breeding program." Menor de Gaspar, J., Knox, R., Cuthbert, R., Ruan, Y., Bokore, F., Meyer, B., Isidro y Sánchez, J. **Poster**.

2024 7th International Conference of Quantitative Genetics, Vienna, Austria, 22–26 July 2024. "The role of sparse designs and advanced modelling in improving genomic selection for plant breeding." Fernández-González, J., Allard, A., Comadran, J., Haquin, B., Combes, E., Bernard, K., Isidro y Sánchez, J. **Poster**.

2024 3rd International Wheat Conference, Perth, Australia, 22–27 September. "InnoVar project outcomes: how genomics can characterize and increase the breeding value of durum varieties." Bozzoli, M. et al. **Poster**. https://www.iwc2024.com/program/

2024 Plant & Animal Genomes Conference (PAG), San Diego, CA, 12–17 January 2024. "Advancing durum wheat genomic resources: from the platinum-quality Svevo genome assembly to the tetraploid wheat pangenome." Cattivelli et al. **Poster**. https://pag.confex.com/pag/31/work/papers/index.cgi?username=51788&password=682037

2024 PAG, San Diego, CA, 12–17 January 2024. "Global oat diversity." Bekele et al. **Poster**. https://pag.confex.com/pag/31/work/papers/index.cgi?username=53886&password=865075

2024 PAG, San Diego, CA, 12–17 January 2024. "Integration of functional genomics and transcriptomics to elucidate gene-regulatory networks in durum wheat development and stress responses." Forestan, C. et al. **Poster**. https://pag.confex.com/pag/31/

work/papers/index.cgi?username=51837&password=319191

2024 PAG, San Diego, CA, 12–17 January 2024. "Upgrading the durum wheat genomic resources: from the platinum-quality Svevo genome assembly to the tetraploid wheat pangenome." Cattivelli, L. et al. **Poster**.

2022 From Seed to Pasta IV, Bologna (Italy), 26–29 Oct 2022. **Invited speaker**. Program: https://bit.ly/3UmKLRp | Website: https://www.fromseedtopasta.com/

2022 11th International Oat Conference, Perth, Australia. "Genome-wide association mapping of *Fusarium langsethiae* infection and mycotoxin accumulation in oat." **Invited speaker**. Program: https://bit.ly/3WwB1FU | Website: https://www.internationaloat.com

2022 11th International Oat Conference, Perth, Australia. "Genomic prediction and training set optimization in a structured Mediterranean oat population." **Invited speaker**.

2022 XIII International Symposium on Grapevine Breeding and Genetics, Landau/Pfalz, Germany, 10–15 Jul 2022. "GWAS using table grape breeding families provides new QTL for berry, seed, and cluster traits." **Poster**. https://ojs.openagrar.de/index.php/VITIS/issue/view/2481

2022 XVIIIth Eucarpia Biometrics in Plant Breeding Conference, Gif-sur-Yvette (France), 21–23 Sep 2022. **Invited speaker**. https://eucarpiabiom22.sciencesconf.org/resource/page/id/2

2020 XVIIIth Monogram Network Meeting, James Hutton Institute, 28–30 Apr 2020. "Adventures in multi-omics I: combining heterogeneous datasets via relationship matrices." **Invited speaker**.

2019 II Simposio Español de Fisiología y Mejora de Cereales, Córdoba, 6–7 Mar 2019. **Poster and talk**. http://sefimec.csic.es/

2019 IRTA, Lleida. "Genomic-assisted breeding for crop improvement." **Invited seminar**. 18 Jul 2019.

2019 University of Galway. "Genomic selection: a tool for crop improvement." **Invited seminar**. https://twitter.com/PABC_Galway/status/1095460889807998976

2018 Irish Cereals Improvement Network, 7 Mar 2018. "Cereal research and breeding for resistance: GWAS in wheat." **Invited speaker**.

2018 Plant & Animal Genome XXVI, 13–17 Jan 2018. "Multi-objective optimized breeding strategies." Akdemir D., Beavis W., Singh A., Fritsche-Neto R., **Isidro-Sánchez J**. **Poster**. https://pag.confex.com/pag/xxvi/meetingapp.cgi/Paper/29030

2017 Monogram Network Meeting, University of Bristol, 2–4 Jul 2017. "Selecting training populations for GS using STPGA." **Invited speaker**. https://monogram.ac.uk

2016 10th International Oat Conference, 11–15 Jul 2016. "How should I select individuals of my training population to make selection in GS?" **Invited speaker**. http://oats2016.org/files/29739_farexpo_program.pdf

2015 Plant & Animal Genome XXII, 10–14 Jan 2015. "Optimization of training population under population structure in GS." **Poster**.

2014 2nd Canadian Wheat Symposium, Saskatoon, 8–11 Jun 2014. "Field evaluation of wheat lines under irrigated and rain-fed conditions in semi-arid Saskatchewan." Poster.

2014 ITMI Joint Conference, Wernigerode, Germany, 29 Jun–4 Jul 2014. "Environmental effects on estimating yield genetic gains of Mediterranean durum wheat."

2013 Plant & Animal Genome XXI, 12–16 Jan 2013. "QTL for chlorophyll content in durum wheat." **Poster**.

2012 Plant & Animal Genome XX, 14–18 Jan 2012. "Relationship of leaf angle and brassinosteroid response loci in durum wheat." **Poster**.

2012 Plant & Animal Genome XV, 10–18 Jan 2012. "Genomic regions determining grain quality and agronomic traits in durum wheat." **Poster**.

2011 1st Congress of Cereal Biotechnology and Breeding, Szeged, 24–27 May 2011. "Brassi-

nosteroid leaf unrolling QTL mapping in durum wheat." **Poster**.

2011 12th International Symposium on Pre-Harvest Sprouting in Cereals, Red Deer, Canada, 24–27 Jul 2011. "Evaluating methods to measure PHS resistance in durum wheat." Oral presentation and poster.

2011 1st Canadian Wheat Symposium, Winnipeg, 30 Nov–2 Dec 2011. "Mapping QTL for leaf angle in durum wheat." **Poster**.

2011 1st Canadian Wheat Symposium, Winnipeg, 30 Nov–2 Dec 2011. "Effects of plant density on durum production." **Poster**.

2007 Plant & Animal Genomes XV, San Diego, 13–17 Jan 2007. "Improving durum wheat adaptation to drought-prone Mediterranean environments via association mapping." **Poster**.

2007 Plant & Animal Genomes XV, 13–17 Jan 2007. "QTLs for drought-related morpho-physiological traits in a durum wheat population under Mediterranean environments." **Poster**.

2007 XVII SEFV / XI Hispano-Luso Congress, Alcalá de Henares, 18–21 Sep 2007. "Evolución del contenido de lisina durante el crecimiento del grano...". **Poster**.

2006 Plant Genomics European Meetings, Venice (Italy), 11–14 Oct 2006. "Chromosome regions controlling drought-related traits in durum wheat germplasm across water regimes." **Poster**.

2006 Plant Genomics European Meetings, Venice (Italy), 11–14 Oct 2006. "Identification of QTLs for drought-related traits in a durum wheat population across water regimes." **Poster**.

2006 University of Buenos Aires (Seminarios de Cereales), Dec 2006. "Eco-physiological and molecular impact of genetic improvement of durum wheat on yield and grain composition." **Oral**.

2006 Eucarpia, Lleida (Spain), 13–17 Nov 2006. "Environmental determination of amino-acid composition in durum wheat grain under Mediterranean conditions." **Poster**.

2006 Eucarpia, Lleida (Spain), 13–17 Nov 2006. "Durum wheat productivity in sustainable Mediterranean agro-ecosystems: yield components and morpho-physiological traits." **Poster**.

2004 International Workshop: Modelling quality traits and their genetic variability for wheat, Clermont-Ferrand (France), 18–21 Jul 2004. "Amino-acid content in durum wheat as affected by water regime in southern Spain." **Poster**.

2004 II Congreso de Mejora Genética de Plantas, León, 21–24 Sep 2004. "Formación del rendimiento en trigo duro en dos ambientes con distinto régimen hídrico: análisis por coeficientes de sendero." **Poster**.

Media articles / science outreach

2022 *Hora 25* (Cadena SER): "Semillas". http://bit.ly/3tc1viu

2019 Dublin Native Scientist — Promoting Science and Language Learning. https://www.nativescientist.com/about

2019 Isidro Sánchez, J. "Winter organic naked barley trial in Co. Wexford." *Organic Matters* (Ireland). http://www.irishorganicassociation.ie/about/organic-matters-magazine/

2019 *Punto de Enlace* (RTVE): "Julio Isidro-Sánchez investiga en Irlanda la selección genética de los cultivos." http://bit.ly/2QQePa6

2018 Gestiona Radio: "Investigadores por el mundo." http://bit.ly/2TlJKfZ

Open-source R packages

2025 **MateR**. https://github.com/TheRocinante-lab/MateR
2024 GE metrics in R. https://github.com/TheRocinante-lab/GEmetrics
2021 TrainSel. https://github.com/TheRocinante-lab/TrainSel
2020 CovCombR. https://cran.r-project.org/web/packages/CovCombR/CovCombR.pdf
2018 GenomicMating. https://cran.r-project.org/web/packages/GenomicMating/GenomicMating.pdf

Peer review

2015–Current Reviewer: *Nature*, *Crop Science*, *Euphytica*, *The Plant Genome*, *Irish Journal of Agricultural and Food Research*, *Heredity*, *Theoretical and Applied Genetics*, *Frontiers in Plant Science*, *Agronomy*, *Plant Breeding*, *Genetics Selection Evolution*.
2018–2024 Associate Editor, section "Plant Breeding, Genetics and Genetic Resources," *Spanish Journal of Agricultural Research*.

Teaching

2023–2024 CIHEAM Zaragoza (Spain): Evaluation of Selection Strategies.
2020–Current Genomic-Assisted Breeding (Master in Computational Biology, Spain).
2020–Current Molecular markers and their application in plant breeding (Master in Biotecnología Agroforestal, Spain).
2020–Current Breeding for abiotic/biotic and quality traits (Master in Biotechnology applied to Plant Breeding, Spain).
2015–2020 Introduction to Crop Science — CPSC10010 (Ireland).
2015–2020 Crop Breeding — CPSC30090 (Ireland).
2016–2020 Organic Agriculture — CPSC30050 (Ireland).
2015–2020 Fundamentals of Arable Crop Production — CPSC20090 (Ireland).
2016–2018 Emerging Crop Pathogens — CPSC30100 (Ireland).
2017–2018 Plant Physiology Ecology — CPSC20040 (Ireland).
2017–2018 Current Developments in Plant Biology — BOTN40200 (Ireland).
2017 Invited instructor, "Bioinformatics to Advance Wheat Breeding" course, Bologna (Italy), 13–14 Nov 2017.
2015–Current Coordinator and instructor, international course on Genomic Selection. https://www.gscourse.com
2014–2015 Teaching Assistant, "Genetic Improvement of Crop Plants" (PBLR4030), Cornell University (USA).
2005–2007 Lab Instructor, Crop Physiology, University of Granada.

Theses supervised

2017–2019 **M.Res.** Kane D'Arcy Cusack. *Association mapping analysis of hexaploid oat (*Avena sativa*) cultivars for resistance to Fusarium mycotoxins.*

2017–2019 **M.Res.** Simone Pasqualin. *Effect of rate and timing of nitrogen application on agronomic and quality traits of* Eragrostis tef.

2019–2022 **Ph.D.** Eogan Curran. *Prediction of disease outbreaks based on wheat cultivar and pathogen genomic models.*

2019–2022 **Ph.D.** Laura Paire. *Developing multi-use barley to improve the organic Irish market.*

2020–2021 **M.Sc.** Javier Fernández-González. *Training optimization in genomic selection: A comparison of algorithms.* https://oa.upm.es/69610/

2020–2021 **M.Sc.** Pablo Atienza. *Detección de variaciones en el número de copias en germoplasma de* Zea mays *adaptado a la altitud.* https://oa.upm.es/69167/

2022–2026 **Ph.D.** Javier Fernández-González. *Genomic-assisted breeding applied to Syngenta's sunflower breeding program.*

2022–2026 **Ph.D.** Julián García-Abadillo. *Machine learning approaches applied to genomic-assisted breeding.*

2023–2024 **M.Sc.** Alejandro Domínguez Rondón. *Integrating genomics and genomic selection to enhance wheat resistance against* Septoria tritici. https://oa.upm.es/83753/

2023–2024 **M.Sc.** Juan Martín Menor de Gaspar. *Empirical data analysis for training population selection in wheat breeding.* https://oa.upm.es/83822/

2024–2028 **Ph.D.** Juan Martín Menor de Gaspar. *Genomic-assisted breeding applied to a public wheat breeding program.*

2024–2028 **Ph.D.** Alejandro Domínguez Rondón. *Data-driven plant breeding: computational methods and applications.*

2024–2025 **M.Sc.** Seifelden Metwally. *Enhancing plant-breeding accuracy through GWAS and genomic prediction models.*

Grants, honors & awards

2020 Senior Beatriz Galindo scholarship (*Investigador Distinguido*) to work at CBGP (from May 2020).

2020 Member (Vocal) of Agricultura Digitalizada y Sostenible para el Desarrollo de la Sociedad y la Bioeconomía (UPM).

2018–Current Vice-President, Spanish Research Society in Ireland.

2012 Talentia Fellowship, Government of Andalusia (Spain).

2009 Postdoctoral scholarship, Ministry of Education and Science (Spain).

2003 Ph.D. scholarship, Ministry of Education and Science (Spain).

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Research and development stays

1999–2001 Internal student, Department of Microbiology, University of Seville.

2004 University of Lleida (Spain), training in AFLP molecular markers. Supervisor: Conxita Royo Calpe.

2005 Near-infrared spectroscopy (NIRS) training, Córdoba (Spain). Supervisor: Prof. Ana Garrido.

2005 SPARC (Canada): molecular markers in durum wheat (doctoral research). Supervisor: Ron Knox.

2006 University of Buenos Aires (Argentina): three-month doctoral stay; research on apical development of durum wheat. Supervisor: Prof. Daniel Miralles.

2007 University of Buenos Aires (Argentina): three-month doctoral stay; research on apical development of durum wheat. Supervisor: Prof. Daniel Miralles.