

CURRICULUM VITAE

Part A. PERSONAL INFORMATION

CV date 23/11/2023

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|---|------------------------------|--|------------|
| First name | Rubén | | |
| Family name | Vicente Pérez | | |
| Gender | Male | Birth date | 11/08/1986 |
| ID number | 70889525Y | URL Web: https://www.itqb.unl.pt/research/plant-sciences/plant-ecophysiology-and-metabolism | |
| e-mail | vicenteperez.ruben@gmail.com | | |
| Open Researcher and Contributor ID (ORCID) | | 0000-0001-5469-2645 | |

A.1. Current position

| | | | |
|--------------------------|---|--|------------------|
| Position | Principal Investigator, Head of Plant Ecophysiology and Metabolism Lab | | |
| Initial date | 01/02/2020 | | |
| Institution | Universidade Nova de Lisboa (UNL) | | |
| Department/Center | Plant Division | Instituto de Tecnologia Química e Biológica Antonio Xavier (ITQB NOVA) | |
| Country | Portugal | Teleph. number | (+351) 214469627 |
| Key words | crop improvement, climate change, abiotic stress, phenotyping, photosynthesis, carbon/nitrogen metabolism, source-sink dynamics, cereals, trehalose 6-phosphate, breeding | | |

A.2. Previous positions

| Period | Position/Institution/Country/Interruption cause |
|-----------------|--|
| 06/2017-01/2020 | Postdoctoral Researcher, Department of System Regulation, Max Planck Institute of Molecular Plant Physiology (Germany) |
| 01/2016-05/2017 | Postdoctoral Researcher, Integrative Crop Ecophysiology Group, University of Barcelona (Spain) |
| 11/2018-12/2018 | Visiting Researcher, University of Campania L. Vanvitelli (Italy) |
| 08/2013-10/2013 | Visiting Researcher, RWTH Aachen University (Germany) |
| 06/2013-08/2013 | Visiting Researcher, Max Planck Inst. Mol. Plant Physiology (Germany) |
| 04/2012-06/2012 | Visiting Researcher at the RWTH Aachen University (Germany) |
| 10/2010-12/2015 | Predocctoral Researcher, Institute of Natural Resources and Agrobiology of Salamanca, IRNASA-CSIC (Spain) |

A.3. Education

| PhD, Licensed, Graduate | University/Country | Year |
|---|----------------------------------|------|
| Ph.D. in Plant Biotechnology | University of Salamanca | 2015 |
| M.Sc. in Plant Biotechnology | University of Salamanca | 2011 |
| M.Sc. in Occupational Risk Prevention | Instituto Madrileño de Formación | 2009 |
| Expert in Renewable Energies & Ener. Efficiency | University of Salamanca | 2008 |
| Postgraduate Certificate in Education | University of Salamanca | 2008 |
| B.Sc. in Environmental Sciences | University of Salamanca | 2008 |

Part B. CV SUMMARY

My research career has been focused on understanding C/N coordination, source-sink dynamics, and responses to abiotic stress for crop improvement and resilience. I did my PhD thesis (**FPI-MICINN fellowship**) under the supervision of Dr. Rosa Morcuende at **IRNASA-CSIC** (Spain). We demonstrated that long-term exposition to **elevated CO₂** caused a **photosynthetic acclimation in wheat due to an inhibition of N assimilation** in leaves and roots, being more exacerbated with a low N supply. We also showed that the negative effects of high temperatures can be partially compensated by elevated CO₂ in field conditions, but depends on N fertilisation. We contributed to the progress of **wheat transcriptomics** by developing a quantitative RT-PCR platform and the first *de novo* RNA sequencing analysis in durum wheat under future climate change scenario, allowing us to identify key target genes for crop improvement. Moreover, I was awarded with 8 **student grants** to present my work in 5

congresses and to assist to 3 Summer Schools abroad (EMBL-EBI, United Kingdom; Teagasc-Oak Park, Ireland; FZ Jülich, Germany). Overall, my PhD thesis led to the publication of **6 papers as first author**, obtained *Summa Cum Laude* grade, International Mention, and the **Extraordinary Doctorate Award** at the University of Salamanca. Then, as **Postdoctoral Researcher at the University of Barcelona** (Spain) under the supervision of Prof. J. L. Araus, I complemented my skills in plant physiology, biochemistry and molecular biology with **high-throughput phenotyping** techniques. This allowed me to develop multidisciplinary, holistic approaches to study stress responses from canopy to organ and cell level, nutrient use efficiency, and their relation to grain yield and quality, collaborating in breeding programmes. Later, I started as **Postdoctoral Researcher at the Max Planck Institute for Molecular Physiology** (Germany), under the supervision of Prof. Mark Stitt and Dr. John Lunn. I studied the key role of the signal molecule **trehalose 6-phosphate** regulating plant central metabolism. I found it induces several key C and N enzymes for the coordinated synthesis of organic acids for plant growth. In 2020, I joined **ITQB NOVA** (Universidade Nova de Lisboa, Portugal) as the **Head of Plant Ecophysiology and Metabolism Laboratory**. We perform multidisciplinary approaches, from field high-throughput phenotyping to omics technologies and biochemical analyses, with the aim to understand the coordination of C-N metabolism at the whole plant level during grain filling to promote crop improvement and resilience in Mediterranean environments. I carried out 4 stays abroad as a visiting researcher that, together with my work in three different countries, led to broaden my **network of internationally recognised collaborators** (Prof. Mark Stitt, Dr. John Lunn, Prof. Aleksandra Skirycz, Prof. José Luis Araus, Prof. Elena Baena-González, Dr. Iker Aranjuelo, and Prof. Petronia Carillo, among others). My career track demonstrates my dedication to scientific excellence with an **h-index of 17/18/19 and 674/772/1017 citations in the Web of Science, SCOPUS and Google Scholar, respectively**. I have published 6 research articles in books and proceedings, and **34 research articles** in peer-review journals: 30 Q1, 11 as first author, 6 as last author, and 10 as corresponding author. I have participated in **42 national and international congresses**, contributing with 25 oral presentations (including 13 as the speaker and 2 as keynote talks) and 23 posters. I participated actively in **25 projects**, funded at regional (4, total=579k€), national (11, total=12.2M€) and European (5, total=27.6M€) level, as well as 5 contracts with the private sector (total=145k€). Of this, I set up my research group with 430k€ for a pioneering phenotyping platform, my contract as Principal Investigator, 2-year postdoc contract, two 4-year PhD contracts, 50k€ for other expenses, and 162k€ obtained from my participation as ITQB representative in two projects of the **European Commission**. I am also the leader of a project with the Oeiras City Hall for Citizen Science and one project with the private sector. Recently in 2023, I was awarded with the **contract “Ramón y Cajal”** from MICINN, obtaining the 5th position in Agricultural and Agri-Food Sciences (97.5/100) and the Talent Attraction award, as well as the **Certificate R3 – Established Researcher**. I supervised 2 postdoctoral researchers, 7 PhD students (3 during short-stays), 4 MSc students, 10 BSc students, 4 lab technicians, and 30 High School students. Apart from leading my own group, I am (i) member of the Research Units of Excellence in Castile and León since 2018 and Basque Country from 2022, (ii) Professor in the international PhD programme Plants for Life at ITQB NOVA, (iii) Editor in *Frontiers in Plant Science* and Associate Editor in *Planta* (>55 manuscripts edited), (iv) member of Doctoral Thesis Committees, and (v) responsible of the phenotyping facilities at my institution.

Part C. RELEVANT MERITS

C.1. Publications

1. Martínez-Peña R, [...] Aparicio N (CA), **Vicente R** (CA). 2023. Genotype-by-environment interaction for grain yield and quality traits in durum wheat: identification of ideotypes adapted to the Spanish region of Castile and León. *European Journal of Agronomy* 151: 126951. doi: [10.1016/j.eja.2023.126951](https://doi.org/10.1016/j.eja.2023.126951). Impact factor: 5.2 (Q1, rank 12/88 Agronomy).
2. Martínez-Peña R, Schlereth A, Höhne M, [...] **Vicente R** (CA). 2022. Source-sink dynamics in field-grown durum wheat under contrasting nitrogen supplies: key role of non-foliar organs during grain filling. *Frontiers in Plant Science* 13: 869680. My position/total authors: 9/9. doi: [10.3389/fpls.2022.869680](https://doi.org/10.3389/fpls.2022.869680). Impact factor: 6.627 (Q1, rank 17/235 Plant Sciences).
3. Peixoto B, Moraes TA, Mengin V, [...] Baena-González E (CA). 2021. Impact of SnRK1 protein kinase on sucrose homeostasis and the transcriptome during the diel cycle. *Plant Physiology* 187: 1357-1373. My position/total authors: 5/12. doi: [10.1093/plphys/kiab350](https://doi.org/10.1093/plphys/kiab350). Impact factor: 8.340 (Q1, rank 9/325 Plant Sciences).
4. Moreno JC, Rojas B, **Vicente R**, [...] Skirycz A (CA). 2021. Tyr-Asp inhibition of glyceraldehyde 3-phosphate dehydrogenase affects plant redox metabolism. *EMBO Journal* 40: e106800. My

position/total authors: 3/19. doi: [10.15252/embi.2020106800](https://doi.org/10.15252/embi.2020106800). Impact factor: 11.598 (Q1, rank 22/295 Biomechistry and Molecular Biology).

5. Sánchez-Bragado R, **Vicente R**, Molero G, Serret MD, Maydup ML, Araus JL (CA). 2020. New avenues for increasing yield and stability in C₃ cereals: exploring the ear photosynthesis. *Current Opinion in Plant Biology* 56: 223-234. doi: [10.1016/j.pbi.2020.01.001](https://doi.org/10.1016/j.pbi.2020.01.001). Impact factor: 7.834 (Q1, rank 10/235 Plant Sciences).

6. **Vicente R** (CA), Bolger AM, Martínez-Carrasco R, Pérez P, Gutiérrez E, Usadel B, Morcuende R (CA). 2019. *De novo* transcriptome analysis of durum wheat flag leaves provides new insights into the regulatory response to elevated CO₂ and high temperature. *Frontiers in Plant Science* 10: 1605. doi: [10.3389/fpls.2019.01605](https://doi.org/10.3389/fpls.2019.01605). Impact factor: 4.402 (Q1, rank 19/235 Plant Sciences).

7. **Vicente R**, Vergara-Díaz O, Kerfal S, [...] Araus JL (CA), Kefauver SC. 2019. Identification of traits associated with barley yield performance using contrasting nitrogen fertilizations and genotypes. *Plant Science* 282: 83-94. My position/total authors: 1/9. doi: [10.1016/j.plantsci.2018.10.002](https://doi.org/10.1016/j.plantsci.2018.10.002). Impact factor: 3.591 (Q1, rank 37/234 Plant Sciences).

8. **Vicente R**, Vergara-Díaz O, Medina S, [...] Araus JL (CA). 2018. Durum wheat ears perform better than the flag leaves under water stress: gene expression and physiological evidence. *Environmental and Experimental Botany* 153: 271-285. My position/total authors: 1/9. doi: [10.1016/j.envexpbot.2018.06.004](https://doi.org/10.1016/j.envexpbot.2018.06.004). Impact factor: 3.712 (Q1, rank 29/228 Plant Sciences).

9. **Vicente R**, Pérez P, Martínez-Carrasco R, [...] Morcuende R (CA). 2016. Metabolic and transcriptional analysis of durum wheat responses to elevated CO₂ at low and high nitrate supply. *Plant and Cell Physiology* 57: 2133-2146. My position/total authors: 1/10. doi: [10.1093/pcp/pcw131](https://doi.org/10.1093/pcp/pcw131). Impact factor: 4.760 (Q1, rank 16/212 Plant Sciences).

10. **Vicente R**, Pérez P, Martínez-Carrasco R, Usadel B, Kostadinova S, Morcuende R (CA). 2015. Quantitative RT-PCR platform to measure transcript levels of C and N metabolism-related genes in durum wheat: transcript profiles in elevated [CO₂] and high temperature at different N supplies. *Plant and Cell Physiology* 56: 1556-1573. doi: [10.1093/pcp/pcv079](https://doi.org/10.1093/pcp/pcv079). Impact factor: 4.319 (Q1, rank 17/209 Plant Sciences).

The rest of my publications can be found in my [ORCID](#), [ResearchGate](#) and [GoogleScholar](#).

C.2. Congress

1. Invited talk. **Vicente R** (CA). COLife Meeting 2022. 19/09/2022, Oeiras, Portugal.

2. Invited keynote talk. **Vicente R** (CA). XV Portuguese-Spanish Symposium on Plant Water Relations. 26-28/01/2022, Lisbon, Portugal.

3. Invited talk. **Vicente R** (CA), Vergara-Díaz O, Martínez-Peña R, [...] Araus JL. Encontro Ciência '21. 28-30/06/2021, Lisbon, Portugal.

4. Oral presentation. **Vicente R** (CA), Torralbo F, González-Murua C, Aranjuelo I, Morcuende R. 3rd Spanish Symposium on Physiology and Breeding of Cereals. 17-18/10/2020, Pamplona, Spain.

5. Oral presentation. **Vicente R** (CA), Vergara-Díaz O, Morcuende R, [...] Araus JL. 2nd Spanish Symposium on Physiology and Breeding of Cereals. 6-7/03/2019, Córdoba, Spain.

6. Poster. **Vicente R** (CA), Arrivault S, Feil R, Fichtner F, Schlereth A, Stitt M, Lunn J. ISPR meeting: Photosynthesis from Light to Life. 17-20/07/2018, Montreal, Canada.

7. Oral presentation. **Vicente R** (CA), Pérez P, Martínez-Carrasco R, [...] Morcuende R. XIV Hispanic-Portuguese Congress of Plant Physiology. 14-17/06/2015, Toledo, Spain.

8. Oral presentation. **Vicente R** (CA), Pérez P, Martínez-Carrasco R, Usadel B, Morcuende R. XII National Meeting of Nitrogen Metabolism. 7-9/07/2014, Bilbao, Spain.

9. Oral presentation. **Vicente R** (CA), Pérez P, Martínez-Carrasco R, Usadel B, Morcuende R. XIII Hispanic-Portuguese Congress Plant Physiology. 24-27/07/2013, Lisbon, Portugal.

10. Oral presentation. **Vicente R** (CA), Morcuende R, Babiano J. Conference Food/Feed Quality, Safety and Risks in Agriculture. 25-28/10/2011, Tallin, Estonia.

C.3. Research projects

1. Ref. RYC2022-037887-I. **Ramón y Cajal Contract**, entitled “**Regulation of carbon and nitrogen metabolism as a key player for source-sink dynamics, abiotic stress responses, and crop improvement and resilience**”. Awarded in the 5th position in the area of Agricultural and Agri-Food Sciences and the 1st with the Talent Attraction Grant. Funded by Spanish Ministry of Science and Innovation. Funding: 50.000€ (Ramón y Cajal) + 70.000€ (Talent Attraction).

2. Ref. 101094587. **Tools and methods for extended plant PHENotyping and EnviroTyping services of European Research Infrastructures, PHENET**. Funded by European Commission, Call

[HORIZON-INFRA-2022-TECH-01](#). Coordinated by Institut National de Recherche pour l'Agriculture, INRAE (France). 2023-2027. Funding: 11,132,235€. Role: Researcher and representative of ITQB NOVA (93,625€ budget).

3. Ref. 101058020. **Integrated SERvices supporting a sustainable AGROecological transition, AgroServ.** Funded by European Commission, Call [HORIZON-INFRA-2021-SERV-01](#). Coordinated by Centre National de la Recherche Scientifique (France). 2022-2027. Funding: 15,000,000€. Role: Researcher and representative of ITQB NOVA (68,930€ budget).

4. Ref. CSI260P20. **Effect of nitrogen availability in grain yield and bioactive compound composition in durum wheat varieties grown under elevated CO₂ and high temperatures.** Funded by Junta de Castilla y León, Call for [Research Projects cofinanced by the European Regional Development Fund](#). PI: Dr. Rosa Morcuende (IRNASA-CSIC). 01/01/2021-31/12/2023. Funding: 172,000€. Role: Researcher.

5. Refs. UIDB/04551/2020, UIDP/04551/2020. **R&D Unit GREEN-IT – Bioresources for Sustainability.** Funded by FCT - Fundação para a Ciência e a Tecnologia, Portugal. Participants: ITQB NOVA (Coordinator), IGC, iBET, INIAV, and INSA. 2020-2023. Funding: 1,881,300€. Role: Beneficiary for the creation of my group, involving 50,000€ budget, 2-year postdoc contract, 2 4-year PhD student fellowships, and 430,000€ for building a phenotyping platform.

6. Ref. PID2019-107154RB-100. **Variability in wheat species response to water deficit under elevated CO₂ and temperature: impact on primary, secondary and antioxidant metabolism and grain quality, WHEATERMET.** Funded by Spanish National Plan R+D+i of the Ministry of Science and Innovation, [R&D&I Projects Oriented to the Challenges of Society](#). PI: Dr. Rosa Morcuende and Juan Arellano (IRNASA-CSIC). 01/06/2020-31/05/2024. Funding: 169,500€. Role: Researcher.

7. Ref. PID2019-106650RB-C21. **Multiscale wheat phenotyping: from ideotype to regional adaptation, WheatPhenoScale.** Funded by Spanish National Plan R+D+i of the Ministry of Science and Innovation, [R&D&I Projects Oriented to the Challenges of Society](#). PI: Dr. J.L. Araus. 01/06/2020-31/05/2023. Funding: 232,320€. Role: Researcher.

8. Ref. AGL2016-76527-R. **Phenotyping in durum wheat: physiological basis, selection criteria and evaluation platforms, FENOTRIGO.** Funded by Spanish Nat. Plan R+D+i of the Ministry of Economy and Competitiveness, [R&D&I Projects for Research Challenges](#). PI: Dr. J.L. Araus. 2017-2019. Funding: 254,100€. Role: Researcher.

9. Ref. AGL2009-11987. **Integration of gene expression with metabolism and photosynthesis for assessing the impacts on durum wheat of the increases in CO₂ and temperature foreseen with climate change.** Funded by Spanish National Plan R+D+i of the Ministry of Economy and Competitiveness, [Projects of Fundamental Research](#). PI: Dr. Rosa Morcuende. 01/01/2010-31/07/2013. Funding: 145,200€. Role: Researcher (PhD fellowship associated with the project).

10. Ref. 229827. **Food and feed laboratory of varied and outstanding research in Estonia, FLAVOURE.** Funded by European Commission, Call [EU-FP7-REGPOT-2008-1](#). Coordinated by Estonian Research Institute of Agriculture (Estonia). 2009-2012. Funding: 843,270€. Role: Researcher.

C.4. Contracts, technological or transfer merits

1. **Oeiras Experimenta: Participatory laboratory.** Funding Company: Oeiras City Hall ([Ciência + Cidadã Programme](#)). Principal Investigator: **Dr. Rubén Vicente** (Universidade Nova de Lisboa). 01/01/2023-31/12/2023. Funding: facilities and field trials for Citizen Science.

2. **Assessing grain yield, quality and resilience of tritordeum as a sustainable strategy for climate change in Portugal (TritorPT).** Funding Company: [Vivagran SL](#). Principal Investigator: **Dr. Rubén Vicente** (Universidade Nova de Lisboa). 01/01/2023-31/12/2024 (starting the second year, with the idea of extending for more years). Funding: 6,000€.

3. **Develop high-throughput phenotyping in Syngenta's network of trials throughout Spain.** Funding Company: [Syngenta España S.A.](#) Principal Investigator: Dr. Shawn C. Kefauver and Dr. María Dolors Serret (University of Barcelona). Project renewed for three consecutive years: (1) 23/10/2017-22/10/2018, funding: 20,000€; (2) 23/10/2016-22/10/2017, funding: 40,000€; and (3) 23/12/2015-22/10/2016, funding: 35,000€.