
This is the **accepted version** of the editorial:

Monte, Elena [et al.]. «Celebrating 50 Years of SEBP : The Spanish Society of Plant Biology». *Physiologia plantarum*, Vol. 177, Num. 3 (May-June 2025), art. e70320 DOI 10.1111/ppl.70320

This version is available at <https://ddd.uab.cat/record/329402>

under the terms of the  ^{IN}
COPYRIGHT license.

EDITORIAL

Celebrating 50 Years of SEBP: The Spanish Society of Plant Biology

Elena Monte^{1,2,*}, Rubén Alcázar³, Vicent Arbona⁴, Teresa Altabella^{1,3,*}

¹Centre for Research in Agricultural Genomics (CRAG) CSIC-IRTA-UAB-UB, Campus UAB, Bellaterra, Barcelona, Spain

²Consejo Superior de Investigaciones Científicas (CSIC), Barcelona, Spain

³Department of Biology, Healthcare and Environment, Section of Plant Physiology, Faculty of Pharmacy and Food Sciences, Universitat de Barcelona, Barcelona, Spain

⁴Dept. Biologia, Bioquímica i Ciències Naturals. Universitat Jaume I. Castelló de la Plana, Spain

*Corresponding authors:

e-mails: elena.monte@cragenomica.es; teresa.altabella@cragenomica.es

This special issue of *Physiologia Plantarum* commemorates the 50th anniversary of the Spanish Society of Plant Biology (“Sociedad Española de Biología de Plantas”, SEBP), honouring five decades of scientific innovation, collaboration, and community-building in plant biology. It is both a celebration of our shared history and a recognition of the colleagues who laid the foundation for what SEBP is today. Their vision and commitment continue to inspire new generations of scientists pushing the boundaries of plant biology.

To mark this milestone, SEBP members were invited to contribute original research and reviews that reflect the richness and diversity of our scientific community. The response was overwhelming and deeply appreciated. While space constraints limited the number of contributions that could be included in this special issue, we want to emphasize that every submission demonstrated the talent and dedication of our members. We extend our heartfelt thanks to all authors for their contributions, whether they appear in these pages or not, as well as to the reviewers who helped enhance the quality of this Special Issue with their feedback.

The SEBP is a scientific society that promotes research, education, and outreach in the field of plant biology. It brings together researchers from across Spain and beyond who are dedicated to understanding how plants function at all levels, from molecular and cellular processes to whole-plant physiology and interactions with the environment. SEBP organizes scientific meetings, supports early-career researchers, and fosters collaboration through its specialized scientific groups.

The scientific groups within SEBP focus on specific areas of plant biology. Each group provides a collaborative platform for researchers with shared interests to exchange ideas, organize specialized symposia, and drive progress in their respective fields. Currently, SEBP comprises eight of such groups, each contributing to the society's mission of advancing plant science through focused research and community engagement.

The **Algal Biology and Biotechnology** group focuses on the biology and biotechnological applications of algae. This includes research into algal physiology and genetics, as well as their use in sustainable technologies such as biofuels, bioplastics, and wastewater treatment.

The **Biotic Interactions** group focuses on plant interactions with other organisms, both beneficial and harmful. This includes symbiosis with microbes, plant-pathogen interactions, and herbivory, aiming to understand the molecular and ecological bases of these relationships.

The **Integration of Plant Metabolism** group investigates how different metabolic pathways in plants are coordinated and integrated. Their research spans carbon and specialized metabolism, energy balance, and the regulation of metabolic networks under various physiological conditions.

The **Mineral Nutrition** group focuses on how plants acquire and utilize mineral nutrients from the soil, and how nutrient availability affects plant health and productivity.

The **Nitrogen Metabolism** group studies nitrogen uptake, assimilation, and remobilization in plants, along with nitrogen's role in plant development and its interaction with other nutrients and environmental factors.

The **Phytohormones** group is dedicated to studying plant hormones and how hormonal signalling regulates plant growth, development, and responses to environmental stimuli. Their research includes both classical hormones and other plant growth regulators.

The **Ripening and Postharvest Physiology** group addresses the physiological and biochemical processes involved in fruit ripening and postharvest biology. Their research includes studies on fruit quality, shelf life, and the molecular regulation of ripening.

Lastly, the **Water Relations** group studies plant water relations, including water uptake, transport, and loss. They also investigate how plants respond to drought and other water-related stresses, with the aim of improving crop water use efficiency.

Each of these groups plays a crucial role in advancing knowledge within its specific area and contributes to SEBP's overarching mission of understanding and enhancing plant life in response to global challenges. The structure of these groups is dynamic, and groups may be created, redefined, or dissolved based on decisions made by the Society's members following established SEBP guidelines.

In this special issue, we present a curated collection of works that highlight the diverse perspectives and research interests of the scientific groups, along with contributions not related with a specific

group. Collectively, these contributions highlight the interdisciplinary nature of the research carried out across by SEBP members and reflect the breadth and richness of contemporary plant biology.

Algal Biology and Biotechnology

In the current climate change scenario, it is of paramount importance to understand the mechanisms underlying stress resistance and improve the biotechnological potential of photosynthetic organisms. Microalgae can be useful models to advance our knowledge on these topics. In this issue, two contributions highlight the value of *Chlamydomonas reinhardtii* as a powerful model system for both fundamental research and applied innovation in algal biology and biotechnology.

Bedera-García et al. studied responses to nutrient limitation in *Chlamydomonas reinhardtii*, using the *vip1-1* mutant deficient in the inositol hexakisphosphate kinase responsible for the synthesis of the signalling molecules inositol pyrophosphates (PP-InsPs). Under nutritional stress conditions, the authors found differences in morphology, cell size and division, chlorophyll levels and photosystem II (PSII) activity, as well as a contrasting metabolic profiles and changes in gene expression related to N assimilation controlled by the NIT2 transcription factor. These findings point to an important role of PP-InsPs in the growth adaptation to limited nitrogen supply (and possibly other nutrients), which might inform the applicability of microalgae in wastewater treatment, where nutrient availability fluctuates over time.

In parallel, **Melero-Cobo et al.** present MoCloro, a modular cloning system that extends the MoClo toolkit to enable standardized chloroplast genome engineering in *Chlamydomonas reinhardtii*. While nuclear transformation in this model alga is well established, chloroplast engineering has lacked high-throughput, flexible tools for multigene assembly. MoCloro uses the Golden Gate method and MoClo syntax to assemble standardized genetic parts (promoters, terminators, markers, and reporters) into transformation-ready constructs. A new vector, pWF.K.4, was created for targeted plastome insertion at the *petA* site, and its functionality was validated through successful transgene expression. In addition, a generic vector (pK4) was designed to expand targeting to other plastome loci. This toolkit enables efficient Design-Build-Test-Learn cycles and enhances *C. reinhardtii*'s potential as a green cell factory for sustainable production of recombinant proteins and valuable metabolites.

Together, these studies demonstrate how mechanistic insight, and technical innovation can synergize to unlock the potential of green microalgae in both ecological and industrial contexts.

Biotic interactions

Plants are constantly challenged by biotic stressors, which require critical decisions about resource allocation between growth and defense. This balance is orchestrated by complex signaling networks involving hormones, metabolic pathways, and regulatory proteins. In this special issue, two studies shed light on distinct but interconnected aspects of this trade-off, illustrating how developmental and immune pathways interact under herbivore and viroid pressure.

Garcia et al. investigated how *Arabidopsis thaliana* balances growth and defense during infestation by the pest *Tetranychus urticae*, focusing on plant growth, development, and reproduction. The findings reveal a temporal trade-off in which plants initially prioritize defenses regulated by jasmonic acid, salicylic acid, auxin, and abscisic acid. On the other hand, reduced levels of growth hormones like gibberellins, cytokinins, and brassinosteroids led to growth arrest. At later stages, growth and associated hormone levels are increased again. The study highlights that mite infestation has long-lasting negative effects on plant fitness and provides insights for developing pest management strategies that enhance resistance without compromising growth.

Silva-Valencia et al. report how the Target of Rapamycin (TOR) signaling pathway influences Potato Spindle Tuber Viroid (PSTVd) infection in tomato plants. In plants, TOR acts as a central hub that integrates signals from nutrients, energy status, hormones, and environmental cues to coordinate growth, development, and stress responses. The researchers found that PSTVd induced the accumulation of the selective autophagy receptor NBR1, inhibiting autophagy flux. However, inhibiting TOR with the drug AZD8055 reduced viroid levels, restored autophagy flux through NBR1, and boosted plant defense responses. These findings suggest that TOR plays a key role in viroid pathogenesis and that TOR inhibitors could help enhance plant resistance to viroid infections.

Integration of Plant Metabolism

Metabolism underpins all aspects of plant development, stress tolerance, and interaction with the environment. Yet, the integration of distinct metabolic pathways and their coordination across tissues and developmental stages remain only partially understood. In this special issue, two studies explore how perturbations in lipid and isoprenoid metabolism influence broader physiological processes in tomato, revealing unexpected crosstalk between metabolic branches and their downstream impact on development and stress adaptation.

López-Tubau et al. investigated the alterations in the metabolome induced by impaired sterol ester biosynthesis in tomato. Plant sterols are stored as sterol esters in cytoplasmic lipid droplets to maintain plasma membrane sterol homeostasis. The formation of these esters is catalyzed by two enzymes, phospholipid:sterol acyltransferase (PSAT) and acyl-CoA:sterol acyltransferase (ASAT), which use phospholipids and acyl-CoA, respectively, as acyl donors. Analysis of tomato lines lacking PSAT and ASAT revealed tissue-specific changes in fruit and seed metabolomes. Beyond expected alterations in free and glycosylated sterols, the study uncovered changes in lipid classes, induction of autophagy, and contrasting effects on phenylpropanoid metabolism—downregulated in fruits and upregulated in seeds. Remarkably, the mutant plants displayed enhanced fruit tolerance to *Botrytis cinerea* and early seed germination, highlighting unexpected links between sterol storage and defense or developmental programs.

Burbano-Erazo et al. explored the tissue-specific roles of geranylgeranyl diphosphate synthases (GGPPS) and phytoene synthases (PSY) in the production of carotenoids and abscisic acid (ABA) in tomato. Carotenoid biosynthesis begins with the formation of phytoene from geranylgeranyl diphosphate (GGPP), catalyzed by PSY. GGPP is synthesized by plastid-localized GGPPS enzymes. In tomato, three isoforms of GGPPS (SIG1–3) and PSY (PSY1–3) interact in a tissue-

dependent manner. The authors generated double mutants combining PSY1 or PSY2 knockouts with SIG2 or SIG3 to dissect isoform specificity. Their results confirm that SIG3 and PSY2 primarily sustain carotenoid biosynthesis in leaves, while SIG2 and PSY1 are more active in flowers and during fruit ripening. Moreover, the study shows that ABA levels in fruit correlate more strongly with PSY1 activity than with total carotenoid content, and that fruit size depends on ABA accumulation in ripe fruit. These findings provide new insights into how specific enzyme combinations regulate plastidial metabolism across developmental contexts.

Mineral Nutrition

As global agriculture faces the dual pressures of increasing food demand and environmental sustainability, optimizing mineral nutrition is a major challenge. Beyond their fundamental roles in plant development, nutrients serve as critical drivers of crop resilience, quality, and yield. This section highlights two reviews that discuss about complementary aspects of nutrient management: the deployment of emerging technologies such as biostimulants and nanofertilizers, and the intricate metabolic and hormonal regulation of carbon and nitrogen interactions that shape plant development and stress responses.

Hernández et al. review the important role of biostimulants and biofertilizers in modern agriculture, particularly their ability to enhance the assimilation of micronutrients—key elements for plant growth, development, and defense activation. The authors highlight how these tools promote plant health and reduce environmental impact. In addition, the review explores the potential of nanotechnology as a smart delivery system for fertilizers, helping prevent overuse and minimizing contamination of soils and groundwater. The integration of these approaches is presented as a critical path toward more sustainable and resilient agricultural systems.

Fañanás-Pueyo et al. review the roles of carbon and nitrogen, two major macronutrients, in regulating plant physiology, with an emphasis on their interactions under nutrient deficiencies or environmental stress. The authors describe how carbon/nitrogen balance affects growth and development through specific metabolic signals and hormonal pathways, revealing the molecular basis of plant phenotypic plasticity. By linking nutrient status with gene regulation and developmental cues, this review provides a comprehensive view of how plants coordinate resource allocation in dynamic environments.

Nitrogen Metabolism

Nitrogen is essential for plant growth, metabolism, and reproduction. However, its assimilation, distribution, and interaction with other metabolic pathways, particularly under stress, remain dynamic and complex. Recent research is uncovering how nitrogen-related processes, from symbiotic fixation to nitric oxide production and urea cycle regulation, contribute to plant performance and stress resilience. In this special issue, three studies examine distinct but interrelated aspects of nitrogen metabolism and its integration with broader physiological processes.

Rubia et al. investigated how carbon allocation changes in soybean plants in response to water availability, particularly in the context of symbiotic nitrogen fixation. Using [U-¹³C]-sucrose labelling, the study showed that under normal conditions, carbon is directed to growing leaves, whereas during drought, it is redirected to primary roots, likely to support root growth. Despite drought-induced accumulation of ureides in leaves, the results indicate that this accumulation does not cause the observed decline in nitrogen fixation under drought. These findings shed light on the metabolic reprogramming that occurs under water stress and its implications for nitrogen metabolism in legumes.

Minguillón et al. report the function of amidoxime reducing components (ARCs) *Lotus japonicus*. These enzymes were originally identified in animals for their ability to reduce compounds such as amidoximes, using electrons from the cytochrome b5/cytochrome b5 reductase (Cb/CbR) system. Although they are also present in plants, appear to have diverse and species-specific functions. While, in animals and algae, like *Chlamydomonas reinhardtii*, ARCs reduce nitrite to nitric oxide (NO), their role in vascular plants had remained unclear. This study demonstrates that cytosolic ARCs in *L. japonicus* function as NO-forming nitrite reductases (NOFNiRs) by receiving electrons from the Cb/CbR system, but do not interact with nitrate reductase as electron donors. The work points to diverse roles of the ARC enzymes in the plant kingdom.

Buezo et al. review the current understanding of the urea cycle in plants, traditionally considered incomplete due to the absence of carbamoyl phosphate synthetase I (CPS I), the enzyme that synthesizes urea from NH₄⁺ in animals. Plants instead rely on CPS II, which uses glutamine to assimilate nitrogen into the urea cycle. The authors review current knowledge of the urea cycle in plants, a biochemical pathway that is primarily linked to the metabolism of the polyamines (PA) such as putrescine or spermine. The review highlights the synthesis and accumulation of PA under a wide range of stress conditions, and their ability to enhance plant tolerance to abiotic stress when applied exogenously. Furthermore, the authors explore the potential connection between the urea cycle, polyamine metabolism and nitric oxide (NO) production, a signalling molecule with key roles in plant development and stress responses.

Phytohormones

Phytohormones orchestrate nearly every aspect of plant development and environmental adaptation, acting through tightly regulated signaling networks. In the context of stress resilience and growth optimization, modulating hormonal pathways has emerged as a powerful strategy for both basic research and agricultural innovation. This special issue includes three studies that use genetic and chemical tools to manipulate the activity of key hormonal systems, including abscisic acid (ABA), auxin, and gibberellins, to enhance drought tolerance, root development, and fruit production. These contributions offer mechanistic insights into hormone signaling and highlight novel strategies for plant improvement.

Auxins are central regulators of plant development, and their activity is tightly controlled by conjugation via GH3 IAA-amido synthetases. **Luque et al.** identify novel small-molecule inhibitors of GH3 enzymes using molecular docking and *Arabidopsis* assays. By screening a

database of food-derived metabolites, they find flavonoids that enhance root growth by interfering with IAA conjugation. This work provides new chemical tools to probe auxin homeostasis and modulate root architecture, with potential applications in agriculture to promote plant growth.

ABA is a crucial phytohormone that modulates stomatal closure and enhances drought tolerance in plants. The study by **Bono et al.** explores chemical modulation of ABA signaling in grapevine, showing that synthetic agonists iSB09 and AMF4 activate specific ABA receptors (VviPYL1, VviPYL4, VviPYL8), reduce transpiration, and improve water use efficiency in grapevine cultivars ‘Bobal’ and ‘Tempranillo’ under drought conditions. These compounds exhibit prolonged activity compared to natural ABA, offering a promising strategy for sustainable viticulture in water-limited environments.

Salazar-Sarasua et al. explore the origin and hormonal regulation of parthenocarpy in tomato. Using CRISPR/Cas9-mediated gene editing of the *SITDF1* gene (*DEFECTIVE IN TAPETAL DEVELOPMENT AND FUNCTION1*), they generated male-sterile mutants in the cultivated tomato (*Solanum lycopersicum*) and its wild relative *Solanum pimpinellifolium*. Only cultivated tomato developed parthenocarpic (seedless) fruits, correlating with gibberellin biosynthesis gene activation in the ovary. The study shows that promoter deletions in key GA biosynthesis genes, arising during domestication, may underlie fertilization-independent fruit development. These results uncover a hormonal and evolutionary basis for parthenocarpy and identify regulatory elements that could be exploited to engineer seedless fruit varieties.

Ripening and Postharvest Physiology

As the final stages of the plant life cycle, fruit maturation and postharvest performance are critical determinants of crop value, shelf life, and consumer acceptance. These processes are influenced not only by environmental conditions during growth but also by genetic and hormonal factors that mediate fruit quality and stress tolerance. In this special issue, one study provides new insight into the genetic and physiological basis of postharvest cold tolerance in zucchini.

García et al. identified a quantitative trait locus (QTL) on chromosome 17 associated with postharvest cold tolerance in *Cucurbita pepo* through GWAS. By evaluating 126 accessions under cold storage, they linked reduced weight loss and chilling injury to allelic variants in genes related to ethylene perception and pectin modification. Biochemical assays confirmed lower oxidative damage and better antioxidant maintenance in tolerant lines. This work provides genetic markers for breeding cold-resilient zucchini varieties and advances understanding of abiotic stress responses during fruit maturation.

Environmental Stress

Abiotic stresses such as drought, salinity, extreme temperatures and alkaline soils, limit plant productivity and threatens global food security. These stresses rarely occur in isolation, and climate change is accelerating their intensity and frequency. Understanding how plants respond to these environmental challenges—from molecular and cellular mechanisms to whole-plant physiology

and agronomic strategies—is essential for developing resilient cropping systems. This special issue brings together four reviews and two research articles that explore how plants perceive, respond to, and can be engineered or managed to tolerate complex environmental challenges. The contributions span mechanistic insights at the molecular level, physiological assessments in model and crop species, and agronomic innovations for climate-smart agriculture. Together, they offer a holistic view of plant responses to abiotic stress and highlight emerging tools and strategies with potential translational impact.

Multifactorial stresses, such as those induced by climate change, present unique challenges for plant productivity due to their non-additive effects. **Yoldi-Achalandabaso et al.** review the combined effect of drought, elevated temperature, and increased CO₂ levels on plants. Through a meta-analysis of available data, they identify general response patterns to this triple abiotic stress interaction, including a potential mitigation of drought effects by atmospheric carbon overfertilization. However, outcomes depend on stress intensity and experimental conditions, underscoring the complexity of predicting plant behaviour under future climate scenarios.

Terán et al. examine various strategies for mitigating the impacts of climate-related abiotic stress. Their review covers physical approaches such as improving water use efficiency and using foliar reflective materials like kaolin, chemical interventions including the exogenous application of metabolites and phytohormones (e.g., ABA, SA, JA), and biological solutions such as mycorrhizal fungi, PGPR inoculation, grafting, and genetic improvement. The authors emphasize the need for integrated, long-term strategies to support agricultural productivity in a changing climate.

Franco-Navarro et al. provide a broad and integrative review of crop adaptation to drought stress. Their article explores key physiological and morphological traits such as stomatal regulation, antioxidant defenses, root system architecture, leaf anatomy, and hormonal signalling. It also highlights molecular mechanisms including epigenetic regulation and stress-responsive transcription factors. Advances in breeding, biotechnological strategies, and agronomic innovations—such as precision irrigation, soil management, and plant–microbe interactions—are reviewed as part of a multi-scale approach to improving drought resilience.

Jiménez et al. focus on reactive oxygen, nitrogen, and sulphur species (ROS, RNS, RSS), which play dual roles in stress responses, acting both as damaging agents and signalling molecules. Their review highlights the importance of post-translational modifications (PTMs) of antioxidant proteins as a fine-tuning mechanism for redox balance, enabling plants to coordinate complex responses to oxidative stress.

Pérez-Martín et al. investigate the response of *Arabidopsis thaliana* roots to bicarbonate-induced alkaline stress. Their results identify the carbonic anhydrase isoform β CA4 as essential for early membrane hyperpolarization and activation of aquaporins and iron acquisition genes. This highlights a central role for β CA4 in apoplastic acidification and tolerance to high bicarbonate levels.

Barba-Espín et al. assess the use of the halophyte *Arthrocaulon macrostachyum* for soil salinity mitigation in tomato cropping systems. Their study shows that intercropping or rotation with this halophyte reduces soil salinity and enhances tomato photosynthesis and stress responses. A mild

oxidative stress induced in tomato is proposed as a protective mechanism that improves salinity tolerance.

Development

Beyond survival under abiotic stress, plants must continuously fine-tune their development to optimize organ function, morphogenesis, and reproductive success. Developmental transitions such as organ abscission, stomatal formation, or ovule development not only reflect intrinsic genetic programs but are also highly responsive to environmental and hormonal cues. In this special issue, four contributions explore how plant developmental processes and organelle functions are orchestrated at the molecular level: from the regulation of abscission in fruit-bearing crops, to transcriptional control of stomatal lineage progression, the modulation of reproductive development under shade conditions, and chloroplast ion homeostasis and pH regulation.

Plant organ abscission is a complex developmental process modulated by hormonal and stress signals, often associated with programmed cell death (PCD). **Briegas et al.** explore the role of sphingolipid long-chain bases (LCBs) in olive fruit abscission. They show that exogenous application of sphinganine (d18:0), but not other LCBs, promotes abscission by inducing ROS accumulation, salicylic and jasmonic acid signaling, and localized programmed cell death in the abscission zone. These findings position d18:0 as a signalling molecule coordinating sphingolipid metabolism and cell death during organ separation.

Stomatal development is governed by a tightly regulated cell lineage program, and its disruption can severely impact gas exchange and plant viability. **Illescas-Miranda et al.** engineered synthetic hypomorphic alleles of the transcription factor MUTE to investigate its role in stomatal development. These alleles partially rescued a loss of MUTE function mutant phenotype in *Arabidopsis*, allowing detailed analysis of cell lineage progression and stomatal patterning. Phenotypic and transcriptomic profiling revealed allele-specific disruptions, underscoring the importance of MUTE's bHLH domain for precise and timely developmental transitions. The study provides new insights into how stomatal development integrates molecular regulation with environmental adaptation.

Shade due to plant proximity greatly impacts plant development, most prominently by triggering elongation and flowering acceleration. Here, **Roig-Villanova et al.** investigated the direct impact of shade on seed production by examining the development of reproductive tissues in *Arabidopsis* after the onset of flowering. Their findings showed that simulated shade reduced seed production, primarily by decreasing ovule number formation. Furthermore, they found that simulated shade repressed the expression of genes that determine ovule number, and rapidly affected gene expression in the reproductive tissues. Interestingly, their results suggest a model whereby shade might affect development via distinct regulatory pathways: a rapid program affecting elongation, and one requiring prolonged shade exposure that affects ovule formation.

Photosynthetic activity is intricately linked to the regulation of cytosolic pH, which fluctuates in response to changes in light intensity. **Rodríguez-Rosales et al.** investigated the role of chloroplast envelope K^+/H^+ antiporters, KEA1 and KEA2, in modulating these pH changes in *Arabidopsis* mesophyll cells. Their findings revealed that light-to-dark transitions cause fast acidification, while the reverse produce alkalization. Notably, mutants lacking KEA1 and KEA2 displayed a more

acidic cytosol in leaf mesophyll cells, together with variations in plasma membrane potential. Their model proposes that in the absence of KEA1/2, protons that would be transported into the chloroplasts stay in the cytosol, making it more acidic. This in turn activates membrane potassium uptake channels causing membrane depolarization, which ultimately may activate the plasma membrane proton ATPase, the main regulator of cytosol pH and membrane potential, to prevent an overly acidic cytosol. These insights underscore the critical role of chloroplast envelope transporters in maintaining ion homeostasis and pH regulation, essential for optimal photosynthetic function.

Altogether these contributions underscore SEBP's enduring commitment to excellence in plant science and to fostering a vibrant and collaborative research community. We hope this special issue serves both as a scientific milestone and as an inspiration for the next generation of plant biologists.

REFERENCES

Barba-Espín, G., Jurado-Mañogil, C., Piskova, Z., Kerchev, P., Hernández, J., Diaz-Vivancos, P. (2025). Halophyte-based crop managements induce biochemical, metabolomic and proteomic changes in tomato plants under saline conditions. *Physiol. Plant.*, 177: e70060. doi: 10.13039/501100011033

Bedera-García, R., García-Gómez, M.E., Personat, J.M., Couso, I. (2025). Inositol polyphosphates regulate resilient mechanisms in the green alga *Chlamydomonas reinhardtii* to adapt to extreme nutrient conditions. *Physiol Plant.* 177(1): e70089. doi: 10.1111/ppl.70089.

Bono, M., Ferrer-Gallego, R., Pou, A., Rivera-Moreno, M., Benavente, J. L., Mayordomo, C., Deis, L., Carbonell-Bejerano, P., Pizzio, G.A., Navarro-Payá, D., Matus, J.T., Martinez-Zapater, J.M., Albert, A., Intrigliolo, D.S., Rodriguez, P. L. (2024). Chemical activation of ABA signaling in grapevine through the iSB09 and AMF4 ABA receptor agonists enhances water use efficiency. *Physiol Plant.* 176(6): e14635. doi: 10.1111/ppl.14635

Briegas, B., Camarero, M., Corbacho, J., Labrador, J., Sanchez-Vera, V., Gavilanes-Ruiz, M., Saucedo-García, M., Gomez-Jimenez, M. (2024). Sphingolipid long chain bases as mediators of cell death in olive fruit abscission. *Physiol Plant*, 177: e70061. doi:10.13039/501100011033

Buezo, J. Urrea, M., González, E.M., Alcázar, R., Marino, D., Moran, J.F. (2025). The urea cycle in connection to polyamine metabolism in higher plants: New perspectives on a central pathway. *Physiol Plant.* In press.

Burbano-Erazo, E., Ezquerro, M., Sanchez-Bel, P., Rodriguez-Concepcion, M. (2025) Specific sets of geranylgeranyl diphosphate synthases and phytoene synthases control the production of carotenoids and ABA in different tomato tissues. *Physiol plant.* In press

Fañanás-Pueyo, I., Carrera-Castaño, G., Pernas, M., Oñate-Sánchez, L. (2025). Signalling and regulation of plant development by carbon/nitrogen balance. *Physiol Plant.* 177(2): e70228. doi: 10.1111/ppl.70228

Franco-Navarro, J.D. Padilla, Y.G., Álvarez, S., Calatayud, Á., Colmenero-Flores, J.M., Gómez-Bellot, M.J., Hernández, J.A., Martínez-Alcalá, I., Penella, C., Pérez-Pérez, J.G., Sánchez-Blanco, M.J., Tasa, M., Acosta-Motos, J.R. (2025). Advancements in water-saving strategies and crop adaptation to drought: A comprehensive review. *Physiol Plant*. In press.

García, A., Castro-Cegri, A., López, A., Segura, M., Benítez, Á., Garrido, D., Palma, F., Martínez, C., Jamilena, M. (2024). A QTL on chromosome 17 identified by Genome - Wide Association Mapping controls postharvest cold tolerance of *Cucurbita pepo* L. *Physiol Plant* 176(6): e14602. doi: 10.1111/ppl.14602

Garcia, A., Talavera-Mateo, L., Petrik, I., Oklestkova, J., Novak, O., Santamaria M.E. (2024) Spider mite infestation triggers coordinated hormonal trade-offs enabling plant survival with a fitness cost. *Physiol. Plant*. 176:e14479.

Hernandez, L. E., Ruiz, J. M., Espinosa, F., Alvarez-Fernandez, A., Carvajal, M. (2024). Plant nutrition challenges for a sustainable agriculture of the future. *Physiol. Plant.*, 176(6): e70018. doi: 10.1111/ppl.70018

Illescas-Miranda, J., Saiz-Pérez, J., de Marcos, A., Fenoll, C., Mena, M. (2025). Synthetic alleles to study MUTE - dependent molecular transitions in stomatal development. *Physiol Plant* 177(1): e70072. doi: 10.1111/ppl.70072

Jiménez, A., Martí, MC., Sevilla, F. (2025) Oxidative post-translational modifications of plant antioxidant systems under environmental stress. *Physiol plant*. In press

López-Tubau, J. M., Laibach, N., Burciaga-Monge, A., Alseekh, S., Deng, C., Fernie, A. R., Altabella, T., Ferrer, A. (2025). Differential impact of impaired sterol ester biosynthesis on the metabolome of tomato fruits and seeds. *Physiol Plant*, 177(1): e70022. doi: 10.1111/ppl.70022

Luque, A., Blanes-Mira, C., Caballero, L., Martínez - Melgarejo, P. A., Nicolás-Albujer, M., Pérez-Alfocea, F., Fernández-Ballester, G., Pérez - Pérez, J. M. (2024). Identification of novel inhibitors of plant GH3 IAA-amido synthetases through molecular docking studies. *Physiol Plant* 176(6): e14612. doi: 10.1111/ppl.14612

Melero-Cobo, X., Gallemí, M., Carnicer, M., Monte, E., Planas, A., Leivar, P. (2025). MoCloro: an extension of the *Chlamydomonas reinhardtii* modular cloning toolkit for microalgal chloroplast engineering. *Physiol Plant* 177(1): e70088. doi: 10.1111/ppl.70088

Minguillón, S., Fischer-Schrader, K., Pérez-Rontomé, C., Becana, M.A. (2024) The enigmatic enzyme ‘amidoxime reducing component’ of *Lotus japonicus*. Characterization, expression, activity in plant tissues, and proposed role as a nitric oxide-forming nitrite reductase. *Physiol. plant* 176:e14438.

Pérez-Martín, L., Almira, M., Estrela-Muriel, L., Tolrà, R., Rubio, L., Poschenrieder, C., Busoms, S. (2024). A role for root carbonic anhydrase β CA4 in the bicarbonate tolerance of *Arabidopsis thaliana*. *Physiol Plant*, 176(6): e70026. doi: 10.1111/ppl.70026

Rodríguez-Rosales, M.P., Rubio, L., Pedersen, J.T., Aranda-Sicilia, M.N., Fernández, J.A., Venema, K. (2024). Chloroplast envelope K⁺/H⁺ antiporters are involved in cytosol pH regulation. *Physiol Plant.* 176(3):e14376. doi: 10.1111/ppl.14376.

Roig-Villanova, I., Torres-Montilla, S., López-Ortiz, E., Di Marzo, M., Sánchez-García, Á., Esteve-Codina, A., Gómez-Cadenas, A., Martínez-García, J.F. (2025). Plant proximity reduces seed yield in *Arabidopsis* plants by decreasing the number of ovule primordia. *Physiol Plant.* 177(2):e70220. doi: 10.1111/ppl.70220.

Rubia, M.I., Larrainzar, E., Arrese-Igor, C. (2025) Drought stress modifies the source-sink dynamics of nitrogen-fixing soybean plants prioritizing roots and nodules. *Physiol plant.* In press

Salazar-Sarasua, B., Roque, E., González-Sanz, C., Bombarely, A., Girardi, C., García-Sánchez, J., Cañas, L.A., Beltrán, J.P., Gómez-Mena, C. (2025). Male sterility-induced parthenocarpy arose during tomato domestication. *Physiol Plant.* 177(2):e70182. doi: 10.1111/ppl.70182.

Silva-Valencia, S., Vázquez Prol, F., Rodrigo, I., Lisón, P., Belda-Palazón, B. (2025) TOR Inhibition Enhances Autophagic Flux and Immune Response in Tomato Plants Against PSTVd Infection. *Physiol plant.* In press

Terán, F., Vives-Peris, V., Gómez-Cadenas, A., Pérez-Clemente, R. M. (2024). Facing climate change: plant stress mitigation strategies in agriculture. *Physiol Plant:* 176(4), e14484. doi: 10.1111/ppl.14484

Yoldi-Achalandabaso, A., Vicente, R., Muñoz-Rueda, A., Pérez-López, U. (2025). Unveiling herbaceous plant responses to future triple interaction of drought and elevated temperature and [CO₂]: systematic review and meta-analysis. *Physiol. Plant.*, 177(1): e70125. doi: 10.1111/ppl.70125