

BIOCHEMICAL REGULATION OF ARGININE BIOSYNTHESIS IN PLANTS

José Alberto Urbano-Gámez¹, Jorge El-Azaz¹, Fernando de la Torre¹, Concepción Ávila¹, Francisco M. Cánovas^{1*}.

¹*Molecular Biology and Biochemistry, Sciences Faculty, University of Málaga, Málaga, Spain.*

*Corresponding author: canovas@uma.es

Arginine plays a relevant role in plant metabolism due to its importance as building block of proteins but also as precursor of multiple secondary metabolites, polyamines and nitric oxide. Importantly, arginine frequently plays an essential role as a major nitrogen storage form in seeds and other vegetative tissues and its mobilization provides an efficient flux of nitrogen for different physiological processes [1][2][3].

Despite its importance, the biochemical regulation and kinetics of the enzymes involved in arginine biosynthesis remains poorly characterized in plants. In this work, we provide new knowledge about the biochemical regulation of the three enzymes involved in the last steps of the arginine pathway: ornithine transcarbamoylase (OTC), argininosuccinate synthetase (ASSY), and argininosuccinate lyase (ASL). Our results indicate that these enzymes are regulated by the concentration of different amino acids and metabolites, including arginine, suggesting that feedback regulatory loops could play an important role in the homeostasis of this amino acid. Besides, these regulatory mechanisms seem to have been subjected to a progressive refinement during the evolution of land plants, pointing towards a coevolution with the higher requirements of arginine in seed plants.

[1] Cánovas FM, Ávila C, Cantón FR, Cañas RA, de la Torre F. (2007) *J Exp Bot.* 58:2307-2318.

[2] Todd CD, Gifford DJ. (2002) *Planta.* 215:110-118.

[3] Babst, BA, Coleman GD (2018) *Plant Sci.* 270, 268-277.

Funding:

This work was supported by grant BIO-2015-69285-R from Ministry of Science and Education and by Garantía Juvenil grant from Spanish Ministry of Work, Migration and Social Healthcare.

FURTHER INFORMATION REQUIRED

- Name & Surname of the presenting author: JOSE ALBERTO URBANO GAMEZ
- E-mail: jalbertourbano@gmail.com
- Session: 01- Metabolism and biochemistry.
- Communication (Oral or Poster): --POSTER
- Do you present your communication for the “Cátedra Luis de Camoens UC3M” award to the best FV2019’s communication by a young doctor? --NO
- Do you present your communication for the “Spanish Society of Plant Physiology” awards to the best FV2019’s communications by a doctoral student? --YES
- Do you apply for a SEFV PhD student fellowship? --YES

IMPORTANT NOTES:

- Candidates for the “Cátedra Luis de Camoens UC3M” and “Spanish Society of Plant Physiology” awards should be the presenting authors of the communications
- Presenting authors must be the first authors of the communications
- (For candidates for the “Cátedra Luis de Camoens UC3M” and “Spanish Society of Plant Physiology” awards) Even if your communication has been selected for oral presentation in FV2019, you must present your communication as poster to be evaluated by the jury.