AOX –a functional marker for efficient cell reprogramming under stress?

Birgit Arnholdt-Schmitt[a,] *, José H. Costa[b] and Dirce Fernandes de Melo[b]

[a] EU Marie Curie Chair, ICAM, University of Évora, 7002-554Évora, Portugal
[b] Department of Biochemistry and Molecular Biology, Federal University of Ceará, PO Box 6029, 60455-900, Fortaleza, Ceará, Brazil

Corresponding author *: eu_chair@uevora.pt.

Abstract

Functional markers for stress tolerance can be used in plant breeding to identify genotypes with high yield stabilities under various conditions. Thus, a good marker should show a strong correlation with favourable adaptive plant behaviour. The efficient reprogramming of target cells for yield determination is currently considered to be the most important step towards defining abiotic stress tolerance. In this Opinion article, we propose a role for the alternative oxidase (AOX) gene as a marker for genetic variation in cell reprogramming and yield stability. Evidence to support this idea comes from the metabolic role of alternative respiration under stress, the link between AOX activity and differential growth, and the single nucleotide polymorphism recently observed in AOX genes. We propose an innovative, interdisciplinary and global research strategy for future experimentation on AOX genes that could have an application in plant breeding.

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