

Daucus carota L. – An old model for cell reprogramming gains new importance through a novel expansion pattern of alternative oxidase (AOX) genes

This article is dedicated to Prof. Dr. emeritus Karl-Hermann Neumann.

J.H. Costa^a, H.G. Cardoso^b, M.D. Campos^b, A. Zavattieri^c, A.M. Frederico^b, D. Fernandes de Melo^a
and B. Arnholdt-Schmitt^{b,*}

^a Department of Biochemistry and Molecular Biology, Federal University of Ceará, PO Box 6029, 60455-900, Fortaleza, Ceará, Brazil

^b EU Marie Curie Chair, ICAM, University of Évora, Apartado 94, 7002-554 Évora, Portugal

^c Laboratory of Plant Breeding and Biotechnology, ICAM, University of Évora, 7002-554 Évora, Portugal

* Corresponding author * e-mail address: eu_chair@uevora.pt

Abstract

The paper highlights *Daucus carota* L. as an ideal model to complement plant stress research on *Arabidopsis thaliana* L. Recently, alternative oxidase (AOX) is discussed as functional marker candidate for cell reprogramming upon stress. Carrot is the most studied species for cell reprogramming and our current research reveals that it is the only one that has expanded both AOX sub-family genes. We point to recently published, but not discussed results on conserved differences in the vicinity of the most active functional site of AOX1 and AOX2, which indicate the importance of studying AOX sequence polymorphism, structure and functionality. Thus, stress-inducible experimental systems of *D. carota* are especially appropriate to bring research on stress tolerance a significant step forward.

Received 17 March 2008, Accepted 24 March 2009; Available online 1 April 2009

DOI: 10.1016/j.plaphy.2009.03.011

Full article available: <http://www.sciencedirect.com>