

**João Daniel Correia Arrabaça**

Portuguese, born December 28<sup>th</sup>, 1945

- Licenciado (Biology), Faculdade de Ciências da Universidade de Lisboa, 1976
- Doctor of Philosophy (Biochemistry), University of Bristol, United Kingdom, 1981, recognized by the University of Lisbon
- Invited Assistant Professor at the Grupo de Botânica, Faculdade de Ciências, Universidade de Lisboa (FCUL), 1981
- Assistant Professor (invitation) the Departamento de Biologia Vegetal, Faculdade de Ciências, Universidade de Lisboa (FCUL), 1982 - 1998
- Associate Professor at the Departamento de Biologia Vegetal, Faculdade de Ciências, Universidade de Lisboa, since 1998

Teaching activities

- Professor of Plant Physiology at the Departamento de Biologia Vegetal (formerly Grupo de Botânica), since 1981
- Professor in the area of Bioenergetics and of Enzyme Kinetics and Regulation, responsible for its introduction in the Biology syllabus, since 1981
- Supervisor of dissertations (doctorate and master) in the area of Plant Physiology and Biochemistry (Biology)

Research interests

Bioenergetics. Oxidative phosphorylation and cyanide resistance in plant and cell respiration. Metabolic control and regulation.

Scientific goals

- Understanding the mechanisms of control of plant respiration and of electron partitioning between the cytochrome chain and the alternative, cyanide insensitive terminal oxidase (AOX)
- Understanding the physiological and metabolic functions of AOX
- Understanding the mechanisms of resistance and adaptation to biotic and abiotic stresses, in plants

Scientific activities and projects:

- Proponent and principal investigator in project “Biochemical and Physiological Aspects of the Prevention of *Bitter Pit* in the Apple Fruit”, Programa Mobilizador em Ciência e Tecnologia, partnership with Estação Agronómica Nacional, Oeiras, 1985-1990, supported by
- Principal investigator of the portuguese team in the project “Function of mitochondrial energy dissipation systems in the response to pro-apoptotic oxidative stress systems”, partnership with Laboratoire de Biologie Cellulaire et Moléculaire des Plantes, Université Pierre et Marie Curie (Paris VI), under the Protocol FCT - Embaixada de França, 2003
- Proponent and principal investigator of the research team working on “Physiology and Biochemistry of Plant Respiration” within the Centro de Engenharia Biológica/FCUL (until 2007), supported by National Board for Scientific and Technology Research, JNICT
- Proponent and principal investigator in the project “Study of the effects of water stress on the bioenergetic processes in plants and their survival, using mutants of the alternative oxidase of *Arabidopsis*” (PTDC/AGR-AAM/69614/2006), partnership with Estação Agronómica Nacional, Oeiras and Centro de Biologia Ambiental, FCUL, supported by FCT, Foundation for Science and Technology (PTDC/AGR-AAM/69614/2006)

- Scientist in the project “Role of a patatin-like lipid acyl hydrolase in membrane degradation under water deficit: Integrating molecular and physiological approaches in *Arabidopsis*” within BioFIG, supported by FCT, Foundation for Science and Technology (PTDC/AGR-AAM/103721/2008)
- Coordinator of Centro de Engenharia Biológica, Faculdade de Ciências da Universidade de Lisboa, since 2000 until 2007
- Researcher at BioFIG, Center for Biodiversity, Functional and Integrative Genomics/FCUL, supported by FCT, Foundation for Science and Technology

#### University teaching:

- 1<sup>st</sup> degree (Licenciaturas) in Biology and in Biochemistry
- Bioenergetics; Enzymology; Plant Physiology
- Master Courses in Plant Physiology and Biochemistry (M. Sc.degree by FCUL and Instituto Superior de Agronomia/UTL)
- Plant Respiration; Advanced Techniques in Biochemistry
- Master Courses on The Science of Earth and Life (Teachers of Secondary Education)  
Modules on Principles of Bioenergetics and on Enzymology

#### Thesis and postgraduate supervisions:

Has been the scientific supervisor of over 15 dissertations for the degree of Doctor (Biology, Biochemistry) and 5 of Master (Biology), by the University of Lisbon

Mentor of postgraduate fellows at CEB/FCUL

#### Publications in international refereed journals

- R. Deana, J. D. Arrabaça, Y. Mathien-Shire, J. B. Chappell, (1979) *FEBS Lett.* 106, 231-234, The Stoichiometry of Ca<sup>2+</sup> Transport in Rat Liver Mitochondria and the Effect of Inorganic Phosphate,
- J. D. Arrabaça (1981), The Mechanisms for the Transport of Calcium in Rat Liver Mitochondria, *Ph. D. Thesis*, University of Bristol, UK,
- M. C. Loureiro-Dias and J. D. Arrabaça (1982) *Zeit. Allg. Mikrobiol.*, 22, 119-122, Flow Microcalorimetry of a Respiration-deficient Mutant of *Saccharomyces cerevisiae*,
- J. D. Arrabaça and M. C. Loureiro-Dias (1982), *Zeit. Allg. Mikrobiol.*, 22, 437-442, Cyanide-resistant Respiration in a Respiration-deficient Mutant of *Saccharomyces cerevisiae*,
- J. D. Arrabaça (1983), *Rev. Biol.*, 12, 473-480, On the Mechanisms of Calcium Cycling in Mitochondria
- A. M. Tenreiro and J. D. Arrabaça (1987) in *Plant Mitochondria: Structural, Functional and Physiological Aspects*, A. L. Moore & R. B. Beechey eds., Plenum Press, New York, 85-88, The Effects of Inhibitors of the b- c<sub>1</sub> Complex on the Respiration of Mitochondria from Aged Potato Discs,
- J. D. Arrabaça, I. M. Ribeiro-Lima and A. M. Tenreiro (1992), in *Molecular, Biochemical and Physiological Aspects of Plant Respiration*, H. Lambers and L. van der Plaas eds., SPB Academic Publishing, The Hague, The Netherlands, 125-131, Interaction Between the Mechanisms of Oxidation of External NADH and NADPH in Plant Mitochondria,
- A. M. Tenreiro, V. Vaz-Pinto and J. D. Arrabaça (1992), in *Molecular, Biochemical and Physiological Aspects of Plant Respiration*, H. Lambers and L. van der Plaas eds., SPB Academic Publishing, The Hague, The Netherlands, 117-123, Simultaneous Oxidation of Substrates and the Effects of Specific Inhibitors in Mitochondria from the Spadix of *Arum italicum*,
- V. Vaz-Pinto and J. D. Arrabaça (1992), in *Molecular, Biochemical and Physiological Aspects of Plant Respiration*, H. Lambers and L. van der Plaas eds., SPB Academic Publishing, The Hague, The Netherlands, 109-116, Purification and Biochemical Characterization of Mitochondria from Carrot Roots
- P. T. Pereira, J. D. Arrabaça, and M. T. Amaral- Collaço (1996), Isolation Selection and Characterization of a Cyanide Degrading Fungus from an Industrial Effluent, *Int. Biodegrad. Biodegrad.* 37, 45-52
- S. Geraldes-Laakso and J. D. Arrabaça (1997), Respiration and Heat Production by Soybean Hypocotyl and Cotyledon Mitochondria, *Plant Physiol. Biochem.* 35, 897-903

- P. T. Pereira, M. M. Carvalho, J. D. Arrabaça, J. C. Roseira and M. T. Amaral- Collaço (1997), Alternate Respiratory System and Formamide Hydrolyase Activity as the Key Components of the Cyanide Resistant Mechanism in *Fusarium oxysporum*, *Can. J. Microbiol.* 43, 929-936
- P. Duque, M. G. Barreiro, J. D. Arrabaça (1999), *Physiol. Plant.* 107: 14-23, Respiratory metabolism during cold storage of apple fruit. I. Sucrose metabolism and glycolysis
- P. Duque, J. D. Arrabaça (1999), *Physiol. Plant.* 107: 24-31, Respiratory metabolism during cold storage of apple fruit. II. Alternative oxidase is induced at the climacteric
- A. Veiga, J. D. Arrabaça, M. C. Loureiro-Dias (2000) *FEMS Microbiol. Lett.*, 190: 93-97, Cyanide-resistant respiration is frequent, but confined to yeasts incapable of aerobic fermentation
- L. M. Marques, J. D. Arrabaça, I. Chagas (2001), *School Sci. Rev.*, 83: 100-103, An alternative way to study the role and activity of the catalase enzyme
- L. M. Marques, J. D. Arrabaça, I. Chagas (2002), *J. Biol. Edu.* 37: 36-38, A simple way to teach the physiological role of ethylene at school laboratories
- J. Davy de Virville, C. Cantrel, A.-L. Bousquet, M. Hoffelt, A.-M. Tenreiro, V. Vaz Pinto, J. D. Arrabaça, O. Caiveau, F. Moreau, A. Zachowski (2002), *Plant Cell Environ.* 25: 1289-1297, Homeoviscous and functional adaptations of mitochondrial membranes to growth temperature in soybean seedlings
- M. Carmo Barreto, R. E. Pinto, J. D. Arrabaça, M. L. Pavão (2003), *Toxicol. Lett.*, 146: 37-47, Inhibition of mouse liver respiration by *Chelidonium majus* isoquinoline alkaloids
- A. Veiga, J.D. Arrabaça, M. C.Loureiro-Dias (2003), *J. Appl. Microbiol.* 95: 364-371, Stress situations induce cyanide-resistant respiration in spoilage yeasts
- A. Veiga, J. D. Arrabaça, F. Sansonetty, P. Ludovico, M. Côrte-Real, M. C Loureiro- Loureiro-Dias (2003), *FEMS Yeast Res.*, 3, 141-148, Energy conversion coupled to cyanide-resistant respiration in the yeasts *Pichia membranifaciens* and *Debaryomyces hansenii*
- Alexandra Veiga, João D. Arrabaça, Maria C. Loureiro-Dias (2003), *FEMS Yeast Res.* 3: 239-245, Cyanide-resistant respiration, a very frequent metabolic pathway in yeasts
- M. Marques, J. D. Arrabaça, I. Chagas (2005), *J. Biol. Educ.*, 39: 131-135, The mechanism of guard cell movement
- M. M. Aranha, A. R. Matos, A. T. Mendes, V. Vaz Pinto, C. M.P. Rodrigues, J. D. Arrabaça (2007), *J. Plant Physiol.*, 164: 675—684, Dinitro-*o*-cresol induces apoptosis-like cell death but not alternative oxidase expression in soybean cells
- A. R. Matos, C. Hourton-Cabassa, D. Cicek, N. Rezé, J. D. Arrabaça, A. Zachowski, F. Moreau (2007), *Plant Cell Physiol.* 48: 856–865, Alternative Oxidase Involvement in Cold Stress Response of *Arabidopsis thaliana* fad2 and FAD3+ Cell Suspensions Altered in Membrane Lipid Composition
- A.L. Ferreira, J.D. Arrabaça, V. Vaz-Pinto, M.E. Lima-Costa (2008), *Biol. Plant.* 52: 66-71, Induction of alternative oxidase chain under salt stress conditions
- C. Hourton-Cabassa, A. R. Matos, J. D. Arrabaça, C. Demandre, A. Zachowski, F. Moreau (2009), *Plant Cell Physiol.* 50: 2084–2091, Genetically Modified *Arabidopsis thaliana* Cells Reveal the Involvement of the Mitochondrial Fatty Acid Composition in Membrane Basal and Uncoupling Protein-Mediated Proton Leaks
- A. R. Matos, A. T. Mendes, P. Scotti-Campos, J. D. Arrabaça (2009), *Physiol. Plant.* 137: 485–497, Study of the effects of salicylic acid on soybean mitochondrial lipids and respiratory properties using the alternative oxidase as a stress-reporter protein
- F. C. Lidon, J. C. Ramalho, I. P. Pais, M. J. Santos, J. D. Arrabaça, M. G. Barreiro (2012), *Int. J. Pest Manag.*, 58: 41-52, Fungistatic action of *Aureobasidium pullulans* on *Penicillium expansum* in “Rocha” pear: implications for oxidative stress during fruit storage

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