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Special Seminar 2014

Glutathione: From the chloroplast to the nucleus and back

Prof Christine Foyer

Centre for Plant Sciences, University of Leeds, UK



Date: Tuesday, 28 January 2014

Time: 4.00 - 5.00 pm

Place: Ag Lecture Theatre (G013, Agriculture North Wing)

Parking: Hackett Drive, Entrance No. 2, 3 and 4 (free parking in yellow car bays)

The low molecular weight thiol antioxidant, reduced glutathione (GSH) is a multifunctional metabolite in plants. GSH is an important redox gatekeeper that maintains redox homeostasis. It also participates in oxidative signalling pathways that regulate gene expression and determine the outcome of plant responses to stress. GSH is synthesised in chloroplasts, from where it is transported to all the compartments of the cell including the nucleus.

Mutants lacking the chloroplast GSH transporters have a low cytosolic GSH pool and have impaired responses to pathogens. Inhibition of glutathione synthesis leads to decreases in the redox potential of the cytosol and the nuclei and to marked changes in gene expression. Low GSH availability leads to failure of the apical root meristem because of an arrest of the cell cycle at G1. GSH is recruited and sequestered in the nucleus early in the cell cycle by mechanisms that remain to be identified. Interestingly, mutants in candidates for GSH binding on the nuclear pore complex show very strong repression of photosynthesis, especially under high light.

This talk will consider the functions of glutathione in cellular redox homeostasis and possible roles in signalling between the chloroplast and nucleus.

Professor Foyer is an internationally renowned research scientist, with more than 300 publications, ranking in the top 10 list of world-wide most cited authors in Plant and Animal Sciences.

She completed a PhD in Biochemistry at Kings College, University of London, and was appointed as Professor of Plant Science at Leeds University in 2009. Previous appointments include Professor of Molecular Agriculture at the University of Newcastle upon Tyne, U.K., and Research Director at the Laboratory of Plant Metabolism and Nutrition, INRA, Versailles, France.

Professor Foyer has been the external examiner for 55 PhD theses in the U.K. and abroad and has published a book called 'Photosynthesis' for students. She is the co-editor of a further six books and an associate editor for a number of scientific journals, a member of several Scientific Advisory Boards and currently holds two Marie Curie Individual Fellowships.

She also holds a fractional appointment as a Research Professor at the University of Western Australia's School of Plant Biology.

Enquiries: (08) 6488 4717

Email: ioa@uwa.edu.au

Website: ioa.uwa.edu.au