Christine Helen Foyer

(born 3 October 1952) is Professor of Plant Science at the University of Leeds, Leeds, UK where she also directs the Human Health and Food Security Project in sub-Saharan Africa in the Africa Laboratory. She has published and co-authored many papers on related subjects.
Foyer's name is included in the "**Foyer-Halliwell-Asada**" pathway, a cellular process of hydrogen peroxide metabolism in plants and animals and named for the three principal discoverers.

During her PhD at King's College, University of London, she showed, for the first time, that the metabolism of ascorbate and glutathione was, in plants, located in the chloroplasts. These observations allowed her to characterize for the first time the ascorbate - glutathione cycle, today named the Foyer - Halliwell - Asada cycle, a crucial mechanism for the elimination of toxic reactive oxygen species (ROS) produced by metabolic activity in plants and animals, allowing their survival in the oxidizing environment present on Earth.

In recognition of these major contributions Christine H Foyer was elected in 1998 a Fellow of the Institute of Biology, now the Royal Society of Biology. Then in 2011 she was recognized as a Redox Pioneer because she has published an article on redox biology that has been cited more than 1000 times, four other articles that have been cited more than 500 times, and a further 12 articles that have been each cited more than 200 times (http://www.ncbi.nlm.nih.gov/pubmed/21534879).

Christine Foyer spent part of her career in France, from 1988 to 1994 at INRA in Versailles, as a Research Director. She was also a visiting professor in 2005 at the University Paris Sud (Orsay).

In 2014 she was elected **Foreign Member of the French Academy of Agriculture** (http://www.academie-agriculture.fr; Life Sciences Section, Plant Production Section).

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Education

Christine H Foyer attended Portsmouth Polytechnic (now the University of Portsmouth) from 1971–74, achieving a BSc with Class II, Division I Honours in Biology (CNAA).

From 1974–77 she attended the Department of Biochemistry, King's College London where she completed her PhD. During this time Foyer also attended a course on immunology at Chelsea College, London.

Career

1974-1977	PhD at Kings College (London, U.K.)
1977-1979	Post-doctoral fellow at the Department of Plant Sciences(Kings College, London, U.K.)
1979-1988	Researcher at the Institute of Photosynthesis Research (University of Sheffield, U.K.)
1988	Invited professor, Laboratoire de Structure et Métabolisme des Plantes, Université Paris-Sud (Orsay, France)
1988-1994	INRA Research Director, Laboratoire du Métabolisme et de la Nutrition des Plantes (INRA, Versailles, France)
1994-1998	Head of the Department Environmental Biology (Aberystwyth, U.K.)
1998-2001	Head of the Department Biochemistry & Physiology (Rothamsted, U.K.)
2001-2006	Head of the Division Crop Productivity cultures & Plant breeding (Rothamsted, U.K.)

2005	Invited Professor, laboratoire de Structure et Métabolisme des Plantes de l'Université Paris-Sud (Orsay, France)
2006-2009	Professor, University of Newcastle upon Tyne (School of Agriculture, Food and Rural Development).
since 2009	Professor, University de Leeds (U.K.), http://www.fbs.leeds.ac.uk/staff/profile.php?tag=Foyer_CH

Work

The Foyer lab is interested in the regulation of growth and development under optimal and stress (drought, chilling, high light, aphid infestation) conditions, with a particular focus on how cellular reduction/oxidation (redox) homeostasis and signalling interact with phytohormone–mediated pathways, particularly involving abscisic acid, auxin and strigolactones. Research focuses on ascorbate and glutathione as key regulators of plant responses to stress and on how redox processes associated with primary metabolism particularly photosynthesis and respiration regulate gene expression.

The Foyer lab uses multidisciplinary approaches incorporating -omics technologies, molecular and biochemical techniques and whole plant physiology to study the relationships between primary metabolism, gene expression and growth under optimal and stress conditions. The lab tackles research problems of intrinsic scientific interest but is always mindful of the needs of agriculture and food security. In addition to undertaking fundamental studies on model plant species such as Arabidopsis thaliana, research in the Foyer lab includes translational aspects, particularly in relation to enhancing stress tolerance in crop species such as soybean, maize and barley.

Christine Foyer also directs the **Human Health & Food Security in Sub-Saharan Africa** (Africa College; http://www.africacollege.leeds.ac.uk) at the University of Leeds, which works in innovative partnerships with African institutions in capacity building and the translation of research results into plant improvement programs.

Publications

https://www.researchgate.net/profile/Christine_Foyer/publications
https://scholar.google.co.uk/citations?user=zXmDA5EAAAAJ&hl=en
From ISI Web of Science (March 2016): 343 publications, >29000 citations, h-index=83
From Google Scholar Citations (March 2016): 572 publications, >44000 citations, h-index=99)
In 2014, she was in third position of the Highly Cited Researchers identified by Thomson Reuters and defined as the preeminent individual researchers in plant science.

Selected publications

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Halliwell B, Foyer CH. 1978. Properties and physiological function of a glutathione reductase purified from spinach leaves by affinity chromatography. *PLANTA* **139**, 9-17

Foyer et al. 1983. Measurement of the ascorbate content of spinach leaf protoplasts and chloroplasts during illumination. *PLANTA* **157**, 239-244

Foyer et al. 1994. Protection against oxygen radicals - an important defense mechanism studied in transgenic plants. *PLANT CELL AND ENVIRONMENT* **17**, 507-523

Foyer et al. 1994. Photooxidative stress in plants. *PHYSIOLOGIA PLANTARUM* **92**, 696-717

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Foyer, CH, Noctor G. 2000. Oxygen processing in photosynthesis: regulation and signalling. *NEW PHYTOLOGIST* **146**, 359-388

Paul MJ, Foyer CH. 2001. Sink regulation of photosynthesis. *JOURNAL OF EXPERIMENTAL BOTANY* **52**, 1383-1400

Noctor et al. 2002. Interactions between biosynthesis, compartmentation and transport in the control of glutathione homeostasis and signalling. *JOURNAL OF EXPERIMENTAL BOTANY* **53**, 1283-1304

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Noctor et al. 2007. Mitochondrial redox biology and homeostasis in plants. *TRENDS IN PLANT SCIENCE* 12, 125-134
Foyer CH, Noctor G. 2009. Redox regulation in photosynthetic organisms: signaling, acclimation, and practical implications. *ANTIOXIDANTS & REDOX SIGNALING* **11**, 861-905
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Foyer CH, Shigeoka S. 2011. Understanding oxidative stress and antioxidant functions to enhance photosynthesis. *PLANT PHYSIOLOGY* **155**, 93-100
Foyer CH et al. 2012. Photosynthetic control of electron transport and the regulation of gene expression. *JOURNAL OF EXPERIMENTAL BOTANY* **63**, 1637-1661
Munne-Bosch et al. 2013. The impact of global change factors on redox signaling underpinning stress tolerance. *PLANT PHYSIOLOGY* **161**, 5-19
Noctor et al. 2014. The roles of reactive oxygen metabolism in drought: not so cut and dried. *PLANT PHYSIOLOGY* **164**, 1636-1648
Foyer CH. 2015. Redox homeostasis: Opening up ascorbate transport. *NATURE PLANTS* **1**, 14012
Schippers et al. 2016. Redox regulation in shoot growth, SAM maintenance and flowering. *CURRENT OPINION IN PLANT BIOLOGY* **29**, 121-128