Centre for Plant Sciences
A centre of excellence in cellular and molecular plant sciences at the University of Leeds
Report 2016
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Overview

The Centre for Plant Sciences (CPS) is a peak of research excellence at the University of Leeds. It is one of the major research groups of the Faculty of Biological Sciences at Leeds in terms of research income and publication outputs and is a major plant science research unit in the UK.

New staff: Twelve academic staff head research groups in cell & molecular plant sciences and currently CPS has over 30 postgraduates, 20 postdoctoral researchers and 9 research technicians. We are in an expansive phase welcoming, through the University of Leeds Great Minds scheme, the arrival in 2015 of Dr Katie Field working on plant-mycorrhizal symbioses and, in October 2016, Dr Thomas Bennett studying root growth – both as University Academic Fellows (UAFs). We also welcomed to our team in 2016 an in-house senior bioinformatician Dr Michael Wilson who is providing valuable input into our projects.

Major CPS research areas of international and global significance include developing resistance to the nematode pests of crops, plant genetic structures & regulation, developmental biology, plant stress biology and plant glycobiology/cell walls.

We pursue our mission of excellence and the highest standards in plant science through interdisciplinary interactions with colleagues in the Faculty of Biological Sciences, the Astbury Centre for Structural Molecular Biology, Schools of Food Science, Chemistry, Environment and Physics and use the resources of the University of Leeds farm.

CPS staff are partners in a range of current EU consortia and programmes including Crop Life, EcoSeed, Epigenome NOE and Sysflo.

Our fundamental plant science and strategic science makes us ideally placed to develop partnerships and collaborative research addressing global challenges and current agenda concerning crops and food security.

The following pages provide snapshots of the current activities of our groups, our research activities, grant funding and publications.

Full details at www.plants.leeds.ac.uk
Contact: plants@leeds.ac.uk
Follow us on twitter @plantscileeds

This report is online at: www.plants.leeds.ac.uk/rep16
Summary of achievements

Research Funding
Since 2011 our CPS research funding portfolio has achieved an income of over £11 million and the breakdown of this is shown schematically here. Most funding is currently being obtained from the UK Biotechnology & Biosciences Research Council (BBSRC) with some in-roads into other research council funding from the Natural Environment Research Council (NERC) and the Engineering and Physical Sciences Research Council (EPSRC). Funding from EU programmes including Marie Curie initiatives remain as a significant component. Individual grant awards are detailed later in the report.

Publication and citations metrics
CPS research groups maintain and extend a high level of outputs in terms of publications. CPS researchers have averaged over 39 publications/year since 2011. In this period our publications have received over 4,900 citations thus averaging ~20 citations/article. We also congratulate Professor Christine Foyer for passing the h-index of 100 milestone on Google Citations in April 2016.

CPS global connections
In this report we highlight the internationality of our research activities and the graphic here indicates the number of publications in the last 5-year period with collaborators in Leeds, the White Rose consortium of Yorkshire universities, the rest of the UK, Europe and the rest of the World.

Recent publication highlights are included in the research group reports that follow and all our publications since 2011 are listed at the end of the report.
Research group reports 2016

Prof. Alison Baker

Membrane transport & organelles | Peroxisomes | Protein trafficking
Chemical Biology | Phosphate transport | ABC D subfamily transporters

My group is interested in membrane protein transport processes in plants. Much of our work has focused on peroxisomes, essential cellular organelles that are involved in an extraordinarily wide range of processes from primary metabolism, signalling and defence responses. We have used a range of biochemical, cell biological, genomic and chemical biology approaches to address the mechanism of transport of both proteins and metabolites across the peroxisome membrane. In the latter case we have identified and characterized a peroxisomal ABC transporter which acts as the primary transport route for fatty acids and pro-hormones into peroxisomes and shown that it possesses a novel thioesterase activity that cleaves acyl CoA substrates upon transport. We have recently initiated a new area of research studying the families of membrane proteins involved in uptake and transport of phosphate with emphasis on structure-function relationships, to help understand whether these proteins play a role in phosphorus use efficiency.

Links
http://www.plants.leeds.ac.uk/people/groups_bak.php

Recent publications
Dr. Yoselin Benitez-Alfonso

Plasmodesmata I Cell-to-cell communication I Root architecture I Callose metabolism I Organ development I Composite materials

Plasmodesmata are intercellular channels that transport proteins, metabolites and RNAs between cells regulating plant responses to developmental and environmental cues. Our research focuses on the mechanisms that control plasmodesmata form and function. We use cell biology, genetics and cell wall biophysics to determine the factors that regulate plasmodesmata transport and their influence on the initiation and development of root organs. We study the metabolism, structure and molecular interactions of callose, a cell wall glycan that plays a major role in plasmodesmata regulation. We are also interested in characterizing the molecular pathways that regulate plasmodesmata transport in roots in response to soil nutrition and nitrogen-fixing bacteria. Results from our research demonstrate the importance of callose in cell wall regulation during the initiation of lateral root organs. It also highlights the potential of using this biopolymer in the design of novel cellulose-based composite materials.

Links
https://benitezalfonso.wordpress.com/

Recent publications


Dr. Andrew Cuming

Gene targeting | Physcomitrella patens | DNA repair and transgene integration | Dehydration tolerance | Abscisic acid | Comparative functional genomics

The model bryophyte *Physcomitrella patens* represents one of the earliest diverging lineages following the transition of plants from an aquatic to a terrestrial environment. We use the remarkable ability of *P. patens* to integrate transgenes at predetermined loci by “gene targeting” to probe the functions of conserved and bryophyte-specific genes. We focus on two features: (i) the way in which genes responsible for the repair of DNA-double-strand breaks participate in targeted transgene insertion, and (ii) the abscisic acid (ABA) and dehydration-stress-response pathway. We are using both “forward” and “reverse genetic” approaches to identify conserved and novel bryophyte-specific functions inherent to these processes, and recently reported the discovery of a novel regulator of ABA responses in the “lower” plants, but absent from vascular plants. We also collaborate with the wider research community, using comparative genomic approaches to explore the evolution of plant gene function. The image illustrates the accumulation of giant peroxisomes following targeted knockout of the *PEX11* peroxisome biogenesis gene, in a collaboration with Alison Baker.

Recently, we launched a contract moss transformation service (Contact ACC for details!) to enable researchers to access our skills via grant funding.

![Peroxisomes and ER visualised in moss protonemata by RFP- and GFP- fusions](image1)

**Links**

[www.plants.leeds.ac.uk/people/groups_cum.php](http://www.plants.leeds.ac.uk/people/groups_cum.php)

**Recent publications**


We are interested in how plants develop and how plant development is modified by the environment. There are three broad areas of research, all linked by a common theme of regulating gene expression to influence how plants grow and develop. We study flowering and flower development, the processes that provide our food. Projects in this area include understanding the robustness of flowering in a variable environment and how temperature is sensed by plants. We also study how two alternative types of gene regulatory mechanisms link to development. In one case we have identified novel regulatory elements that selectively alter the stability of specific mRNAs, allowing plants to alter gene expression rapidly in response to environmental changes. In another project we are using both mechanistic and evolutionary approaches to study how a common ‘hub’ of repression has been independently co-opted multiple times by a wide range of transcription factors to regulate numerous plant processes.

**Recent publications**


**Links**
[www.plants.leeds.ac.uk/people/groups_dav.php](http://www.plants.leeds.ac.uk/people/groups_dav.php)
We study the secretory pathway, a group of membrane bound organelles that play key functions in virtually every process of eukaryotic life. Our research is mainly curiosity- and hypothesis-driven, and we use biochemical transport assays, cellular engineering, and in vivo imaging techniques to capture the exciting microcosmos of plant cells. We aim to understand complete transport processes so that each step can be explained via bio-molecular interactions, conformational changes, molecular switches and the principle of recycling. More recently, we have become interested in harnessing the plant secretory pathway for the renewable production of food, energy and materials from plants.

Links
www.plants.leeds.ac.uk/jd/
www.facebook.com/DeneckeLab

Recent publications


The nutritional symbioses formed between the vast majority of land plants and soil fungi dates back to when plants first colonized Earth’s land masses, more than 475 million years ago. These associations are known as ‘mycorrhizas’ or ‘mycorrhiza-like’ in plants without roots. We work with a range of land plant lineages and their fungal partners, investigating how the efficiency by which plant-fixed carbon is exchanged for fungal-acquired nutrients is affected by environmental perturbation, such as changes in atmospheric CO₂. Using a variety of physiological tools including isotope tracing and environmental metabolomics, our research aims to shed new light on the role fungal symbionts may have played a role in the development of Earth’s ecosystems and to expand our understanding of crop-mycorrhiza-environment interactions in sustainable agricultural systems.
Prof. Christine Foyer

Stress Tolerance | Redox signalling and antioxidants | Photosynthesis | Plant growth & development | Cystatin technology | Low temperature | Drought | High light | Aphid resistance

Our research concerns how primary processes (photosynthesis, respiration) alter the reduction/oxidation (redox) status of the cell and how redox signals interact with phytohormone–mediated pathways to regulate growth and defence responses. We study responses to aphid infestation, drought, chilling and high light stress, as well as combined biotic and abiotic stress conditions. We use multidisciplinary approaches to study the relationships between primary metabolism, gene expression and growth under optimal and stress conditions. My lab tackles fundamental 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 my lab is undertaken to enhance stress tolerance in a range of crop species particularly soybean, faba bean, barley and wheat.

Links
www.plants.leeds.ac.uk/people/groups_foy.php

Recent publications


Dr. Stefan Kepinski

Auxin signalling & auxin-regulated development | Auxin perception & signalling | Novel auxinic chemistry | Gravitropism | Gravitropic setpoint angle control | Epidermal patterning

We are interested in understanding how the plant hormone auxin controls such a remarkable range of developmental events. Auxin regulates both patterning and growth and our projects reflect this broad division. For patterning we are investigating how the spatial control of auxin responsiveness in the root epidermis contributes to the formation of hair and non-hair cells. For growth we are studying how root and shoot branch angles are set and maintained with respect to gravity (so called gravitropic setpoint angles). We have discovered a novel role for auxin in the maintenance of non-vertical branch GSAs which are an important determinant of the plant’s ability to capture resources above and below ground. These projects are based on genetic and molecular genetic analysis integrated with computational approaches.

We also have projects focused on the earliest events of auxin perception where we are using biophysical, thermodynamic and structural techniques to characterise the docking and binding of auxin and Aux/IAA proteins to the TIR1/AFB auxin co-receptors.

This work is providing a platform for the development of next-generation auxinic agrochemicals.

Links
www.plants.leeds.ac.uk/people/groups_kep.php

Recent publications


Prof. Paul Knox

Plant & algal cell walls | Plant glycobiology | Polysaccharides | Microscale analytical platforms | Growth & development | Bioenergy crops & Cell wall deconstruction | Brown algae polysaccharides

Our interests focus on the structure-function relations of the matrix glycans of plant & algal cell walls and extend from model systems to fruit, vegetable, fibre & bioenergy crops. Our strategy involves the development of monoclonal antibody probes for defined oligosaccharides and to use these to understand cell wall matrix polymer developmental dynamics. Our probes are used for in situ fluorescence imaging & in novel microscale chromatographic separations that can identify sub-populations and inter-polysaccharide links. Recent highlights have included the isolation of new sets of monoclonal antibodies to brown algal polysaccharides of the sulphated fucan/fucoidan class – an important set of bioactive polymers. Our antibodies are available through PlantProbes.

Fluorescent tagged fucans in Fucus vesiculosus

Links
www.plantcellwalls.net
www.plantprobes.net
t: @plantprobes

Recent publications


Prof. Peter Meyer

Plant epigenetics | DNA methylation | Abiotic stress | Gene expression | Adaptation

We are interested in the role that DNA methylation plays in regulating plant gene expression, development and adaptation to abiotic stress. We especially focus on dense methylation patterns that are controlled by DNA methyltransferase MET1. In recent years, we have extended the functional analysis of MET1 and its target genes from Arabidopsis into crop species. We have used the mammalian DNA demethylase TET3 to induce heritable DNA methylation changes, producing novel epigenetic variants. Epigenetic variants are investigated for correlation between individual phenotypes and the ectopic expression of individual genes that have become hypomethylated.

Links
www.personal.leeds.ac.uk/~genpme/

Recent publications

Examples of epigenetic tomato lines with heritable phenotypes induced by DNA demethylation: Left: Lines with delayed or inhibited shoot apical meristem development. Right: A line displaying a terminal flower phenotype
Prof. P.E. Urwin

Plant nematology | Crops | Plant pathology | Nematology | Comparative genomics

Plant parasitic nematodes (PPNs) cause >$100 billion annual losses to world agriculture of which cyst and root-knot nematodes contribute over 80%. Their management involves crop rotation and host resistance, which provide incomplete control, and chemical nematicides, which are the most toxicological and environmentally damaging pesticides in widespread use posing considerable risk to aquatic ecosystems and drinking water supplies. The approaches taken by the group to overcome this challenge include developing biofumigation to replace the withdrawn nematicides and utilising well established anti-feedant technology as well as newly developed behavioural repellents and RNAi to provide plant based resistance to nematodes in several crops. We are also undertaking fundamental research using the model species *C. elegans* and utilising the data we have generated by the sequencing the *Globodera pallida* genome and multiple transcriptomes, to identify novel strategies and targets for engineering nematode resistance.

**Links**

www.fbs.leeds.ac.uk/nem/

**Recent publications**


DNA repair and recombination | DNA damage | Plant growth & development | Abiotic stress responses | DNA damage signalling | Seed viability and vigour

We are interested in the elucidating roles of DNA repair and recombination in plant growth and development and their potential to improve crop productivity and increase stress resistance. Our research focuses on understanding DNA repair mechanisms in plants using model species such as Arabidopsis, barley and brassica. In particular, we have characterised the recombination pathways that repair chromosomal breaks, one of the most cytotoxic forms of DNA damage. Our interests also include characterisation of DNA damage responses, integrating genetic, biochemical and omic approaches to understand the transcriptional and post-translational signalling pathways that regulate DNA repair, cell death and growth under stress. Recent progress has identified important roles for recombination in the seed stages of the plant life cycle, with genome repair critical to rapid germination and successful seedling establishment. Our continued research is revealing the relationship between genome repair and seed vigour. We are investigating approaches to improve seed longevity and germination performance, and are evaluating novel molecular markers for seed quality.

Links
www.plants.leeds.ac.uk/groups_wes.html

Recent publications


Grant Funding/Publications

**BBSRC CASE / Industrial CASE partnership programmes in progress**

Optimising Phosphate recovery from waste water using photosynthetic aquatic organisms
ENZA ZADEN UK Ltd. (2013-2017) Peter Meyer
Generating epigenetic diversity in plants
ENZA ZADEN UK Ltd. (2013-2017) Peter Meyer
DNA demethylation strategies and targets in crops
Genetic determinants of cell wall composition in sugar beet storage roots.

**CPS Research Grants 2012 – 2016**

**2016**

**BBSRC – £2,208,389**

Alison Baker, Regulation of Poly phosphate metabolism in *Chlamydomonas*, 1/1/2016-31/12/2020, £830,381
Katie Field, Interactions between crops, arbuscular mycorrhizal fungi and atmospheric CO2, 1/1/2016-31/12/2020, £830,381
Stefan Kepinski, The molecular basis of gravitropic setpoint angle control in higher plants, 1/4/2016-31/3/2019, £454,505
Paul Knox, Isolation/Characterisation/Activity screening of a high value bioactive complex of proteogalactans (glycans) from a high exopolysaccharide (EPS) forming strain of microalgae, 1/1/2016-31/12/2016, £40,000
Peter Urwin, GS effectors, 2/10/2016-1/10/19, £432,379

**Other – £559,732**

Katie Field, NERC Standard Grant - New Investigator, Shifting symbiotic scenarios at the dawn of land plant-fungus associations, 1/4/2016-31/3/2019, £541,939
Stefan Kepinski, Newton Fund: PhD Placement Grant, 1/4/02016-30/9/2016, £17,793

**2015**

**BBSRC – £761,427**

Christine Foyer, Functions of the Whirly 1 protein in chloroplast-nucleus crosstalk in barley leaves, 1/5/2015-30/4/2018, £397,732
Christine Foyer, FACCE-JPI Knowledge Hub: A detailed climate change risk assessment for European agriculture and food security, in collaboration with international projects, 1/11/2015-31/10/2017, £160,401
Peter Urwin and Howard Atkinson, BBSRC HAPI Potato proposal, 1/10/2015-30/9/2020, £203,294

**Charity – £26,700**

Katie Field, Royal Society, Functional and metabolism in ancient plant-fungal symbioses, 30/12/2015-29/12/2016, £14,700
Christine Foyer, Royal Society, Effects of abiotic stress on plant responses to aphid infestation, 1/10/2015-30/9/2017, £12,000

**Other – £93,672**

Yoselin Benitez-Alfonso, EPSRC, Mechano-physical properties of the biopolymer callose: a cell wall matrix or just a sealant? 3/8/2015-2/8/2016, £93,672

**2014**

**BBSRC – £2,392,227**

Alison Baker, Exploring the role of acyl CoA cleavage by COMATOSE a plant ABC transporter in regulating entry of substrates into beta oxidation, 3/2/2014 – 2/2/2017, £403,439
Brendan Davies, FLOWPLAST, 1/3/2014 – 28/2/2017, £451,829
Brendan Davies, A New Conditional Gene Regulation System in Plants, 1/1/2014 – 31/12/2016, £410,053
Stefan Kepinski, Next generation auxins and anti-auxins: principles for binding and design, 1/1/2014 – 31/12/2016, £358,506
Paul Knox, Pectic RG-I and the generation of plant cell wall properties, 1/1/2014 – 31/12/2016, £411,948
Peter Urwin and Howard Atkinson, Establishing biofumigation as a sustainable replacement to pesticides for control of soil-borne pests and pathogens of potato and horticultural crops, 1/3/2014 – 28/2/2018, £356,452

**Other – £559,732**

Katie Field, NERC Standard Grant - New Investigator, Shifting symbiotic scenarios at the dawn of land plant-fungus associations, 1/4/2016-31/3/2019, £541,939
Stefan Kepinski, Newton Fund: PhD Placement Grant, 1/4/02016-30/9/2016, £17,793
EU – £167,229
Paul Knox, Functional analysis of pectic RG-1 in tomato and strawberry fruit, 1/10/2014–30/9/2016, £167,229

Industry – £129,953
Brendan Davies, Bayer Crop Science, A New Conditional Gene Regulation System in Plants, 1/1/2014 – 31/12/2016, £60,000

Peter Urwin and Howard Atkinson, British Potato Council, Establishing biofumigation as a sustainable replacement to pesticides for control of soil-borne pests and pathogens of potato and horticultural crops, 1/3/2014 – 28/2/2018, £69,953

Charity – £181,241
Chris West, Leverhulme Trust, Understanding the molecular links between transcription and recombination, 1/6/2014 – 31/5/2017, £181,241

Christine Foyer, Roles for heme oxygenase and abscisic acid insensitive-4 in drought tolerance, 1/5/2014 – 30/11/2016, £24,000

Other – £13,990
Peter Urwin and Howard Atkinson, Agriculture & Horticulture Development Board, Establishing biofumigation as a sustainable replacement to pesticides for control of soil-borne pests and pathogens of potato and horticultural crops, 1/3/2014 – 28/2/2018, £13,990

2013

BBSRC – £1,033,621
Stefan Kepinski, Commercialisation of ARF-CA technology, 1/2/2013 – 31/7/2014, £155,619
Peter Urwin and Howard Atkinson, LWEC, 1/3/2013 – 31/08/2016, £421,182

EU – £777,708
Andy Cuming, Identification and Characterisation of the sex locus in the Dioecious Moss Ceratodon purpureus, 2/9/2013 – 1/9/2015, £237,626
Christine Foyer and Chris West, Impacts of Environmental Conditions on Seed Quality, 1/1/2013 – 31/12/2016, £311,798

Peter Meyer, Comparative analysis and mammalian DNA methylatino functions in epigenetic Arabidopsis mutants, 1/9/2013 – 31/08/2015, £228,284

Charity – £101,765
Peter Meyer, Leverhulme Trust, Dissecting an ancient but hitherto cryptic function of DNA methyltransferases, 28/2/2013 – 27/02/2015, £101,765

2012

BBSRC – £230,582
Christine Foyer, FACCE MACSUR Knowledge Hub Crop Modelling, 13/9/2012 – 12/9/2015, £53,820
Peter Urwin, Collaboration with Southampton, 1/6/2012 – 31/5/2015, £176,762

EU – £411,651
Alison Baker, Improved Millets for Phosphate ACquisition and Transport, 9/5/2012 – 8/5/2014, £175,304
Christine Foyer, Extending Soybean Lifespan, 1/6/2012 – 31/5/2014, £236,347

Charity – £613,106
Alison Baker and Andy Cuming, Leverhulme Trust, Synthetic organelles: manipulating peroxisome protein import to create designer compartments, 1/10/2012 – 30/9/2015, £221,906
Alison Baker, Gatsby Foundation, Gatsby Summer School, 1/4/2012 – 28/2/2014, £375,000
Christine Foyer, Royal Society, Understanding stress tolerance traits in grapevine, 21/2/2012 – 20/2/2012, £11,200
Paul Knox, Yorkshire Agricultural Society, Molecular characterization of the interaction of nitrogen-fixing cyanobacteria with wheat roots, 1/4/2012 – 31/3/2013, £5,000

Industry – £500,000
Peter Urwin and Howard Atkinson, Sinochem Corporation, Leeds Research Collaboration, 1/9/2012 – 31/8/2015, £500,000

Other – £8,000
Peter Urwin and Howard Atkinson, EPSRC, India Sciences Bridges extension, 1/1/2012 – 31/12/2013, £8,000
2011

**BBSRC – £230,829**

**EU – £559,223**
Christine Foyer, Systemic signalling in plant – aphid interactions, 1/6/2011 – 31/5/2013, £224,824
Christine Foyer, Redox Regulation of Nuclear Proteins, 1/5/2011 – 30/4/2013, £153,787

**Other - £55,000**

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CPS publications

**2011 – 2016**

**2016**


2015

Airoldi CA, McKay M, Davies B (2015) MAF2 is Regulated by Temperature-Dependent Splicing and Represses Flowering at Low Temperatures in Parallel with FLM. PloS one 10, e0126516. DOI:10.1371/journal.pone.0126516


Tripathi L, Babirye A, Roderick H, Tripathi JN, Changa C, Urwin PE, Tushemereirwe WK, Coyne D, Atkinson HJ (2015) Field resistance of transgenic plantain to nematodes has potential for future African food security. Scientific Reports 5, 8127. DOI:10.1038/srep08127


2014


Quain MD; Makgopa ME; Márquez-García B; Comadira G; Fernandez-Garcia N; Olmos E; Schnaubelt D; Kunert KJ; Foyer CH (2014) Ectopic phytocystatin expression leads to enhanced drought stress tolerance in soybean (Glycine max) and Arabidopsis thaliana through effects on strigolactone pathways and can also result in improved seed traits. Plant Biotechnol Journal DOI:10.1111/pbi.12193


2013

Bartoli CG; Casalongue CA; Simontacchi M; Marquez-Garcia B; Foyer CH (2013) Interactions between hormone and redox signalling pathways in the control of growth and cross tolerance to stress Environmental And Experimental Botany 94, 73-88 DOI:10.1016/j.envexpbot.2012.05.003


Brown L-A; Larson TR; Graham IA; Hawes C; Paudyal R; Warriner SL; Baker A (2013) An inhibitor of oil body mobilization in Arabidopsis NEW PHYTOLOGIST 200, 641-649 DOI:10.1111/nph.12467


Crisford A; Ludlow E; Marvin J; Kearn J; O’Connor V; Urwin PE; Lilley C; Holden-Dye L (2013) LEVERAGING C. ELEGANS CUE-DEPENDENT BEHAVIOR TO UNDERSTAND THE HOST/PARASITE INTERACTION FOR PLANT PARASITIC NEMATODES JOURNAL OF NEMATOLOGY 45, 285-285,

De Marcos Lousa C; van Roermund CW; Postis VL; Dietrich D; Kerr ID; Wanders RJ; Baldwin SA; Baker A; Theodoulou FL (2013) Intrinsic acyl-CoA thioesterase activity of a peroxisomal ATP binding cassette transporter is required for transport and metabolism of fatty acids. Proceedings of the National Academy of Sciences of USA 110, 1279-1284 DOI:10.1073/pnas.1218034110


Field KJ, George RM, Fearn B, Quick WP and Davey MP (2013) Best of both worlds: simultaneous high-light and shade-tolerance adaptations within individual leaves of the living stone Lithops aucampiae. PLoS ONE 18, 207-2090, DOI:10.1089/ars.2013.5278

Gentry M; Meyer P (2013) An 11bp region with stem formation potential is essential for de novo DNA methylation of the RPS element PloS One 8 -, DOI:10.1371/journal.pone.0063652

Gilbert HJ; Knox JP; Boraston AB (2013) Advances in understanding the molecular basis of plant cell wall polysaccharide recognition by carbohydrate-binding modules Current Opinion in Structural Biology 23, 669-677, DOI:10.1016/j.sbi.2013.05.005


Kerchev PI; Karpinska B; Morris JA; Hussain A; Verrall SR; Hedley PE; Fenton B; Foyer CH; Hancock RD (2013) Vitamin C and the abscisic acid-insensitive 4 transcription factor are important determinants of aphid resistance in Arabidopsis. Antioxid Redox Signal 18, 2091-2105 DOI:10.1089/ars.2012.5097

Lee KJD; Cornault V; Manfield IW; Ralet M-C; Knox JP (2013) Multi-scale spatial heterogeneity of pectic rhamnogalacturonan I (RG-I) structural features in tobacco seed endosperm cell walls The Plant Journal 75, 1018-1027 DOI:10.1111/tpj.12263

Lloyd JP; Davies B (2013) SMG1 is an ancient nonsense-mediated mRNA decay effector PLANT JOURNAL 76, 800-810 DOI:10.1111/tpj.12329

Luís AS; Venditto I; Prates JAM; Ferreira LMA; Temple MJ; Rogowski A; Baslé A; Xue J; Knox JP; Najmudin S; Fontes CMGA; Gilbert HJ (2013) Understanding how noncatalytic carbohydrate binding modules can display specificity for xyloglucan Journal of Biological Chemistry 288, 4799-4809 DOI:10.1074/jbc.

Luís Garcia-Gimenez J; Markovic J; Dasi F; Queval G; Schnaubelt D; Foyer CH; Pallardo FV (2013) Nuclear glutathione BIOCHIMICA ET BIOPHYSICA ACTA-GENERAL SUBJECTS 1830, 3304-3316 DOI:10.1016/j.bbagen.2012.10.005

Meyer P (2013) Transgenes and their contributions to epigenetic research The International Journal of Developmental Biology 57, 509-515 DOI:10.1387/ijdb.120254pm

Munné-Bosch S; Queval G; Foyer CH (2013) The impact of global change factors on redox signaling underpinning stress tolerance Plant Physiology 161, 5-19 DOI:10.1104/pp.112.205690

Noctor G; Mhamdi A; Queval G; Foyer CH (2013) Regulating the Redox Gatekeeper: Vacuolar Sequestration Puts Glutathione Disulfide in Its Place PLANT PHYSIOLOGY 163, 665-671 DOI:10.1104/pp.113.223545


Schnaubelt D; Queval G; Dong Y; Diaz-Vivancos P; Makgopa ME; Howell G; DE Simone A; Bai J; Hannah MA; Foyer CH (2013) Low glutathione regulates gene expression and the redox potentials of the nucleus and cytosol in Arabidopsis thaliana. Plant Cell Environment - DOI:10.1111/pce.12252


Tripathi L; Tripathi JN; Roderick H; Atkinson HJ (2013) Engineering nematode resistant plantains for sub-Saharan Africa Acta Horticulturae 974, 99-108

Verhertbruggen Y; Marcus SE; Chen J; Knox JP (2013) Cell Wall Pectic Arabinans Influence the Mechanical Properties of Arabidopsis thaliana Inflorescence Stems and Their Response to Mechanical Stress PLANT AND CELL PHYSIOLOGY 54, 1278-1288, DOI:10.1093/pcp/pct074


2012


Brunoud G; Wells DM; Oliva M; Larrieu A; Mirabet V; Burrow AH; Beeckman T; Kepinski S; Traas J; Bennett MJ; Vernoux T (2012) A novel sensor to map auxin response and distribution at high spatio-temporal resolution. Nature 482, 103-106 DOI:10.1038/nature10791

Calderón Villalobos LIA; Parry G; Estelle M; Lee S; Napier R; De Oliveira C; Ivetac A; Brandt W; Armitage L; Kepinski S; Sheard LB; Tan X; Mao H; Zheng N (2012) A combinatorial TIR1/AFB-Aux/IAA co-receptor system for differential sensing of auxin Nature Chemical Biology 8, 477-485 DOI:10.1038/nchembio.926

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