University of Birmingham

Dr George W. Bassel PhD

Birmingham Fellow

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About

(/university/colleges/les/research-gallery/george-bassel.aspx) George Bassel was appointed as a Birmingham Fellow in 2012. His group focuses on understanding how genes change the shape of plant cells. Using seed germination as a model system, Dr. Bassel is uncovering gene regulatory networks that control cell shape changes, and how these networks are influenced be the environment.

Qualifications

PhD University of Guelph 2006 in Molecular and Cellular Biology
BSc University of Guelph 2001 in Biosciences

Biography

George did a PhD on hormone signal transduction pathways in seeds with Dr. Derek Bewley FRSC at the University of Guelph, Canada. He went on to work as a postdoc with Dr. Nick Provart at the University of Toronto, and with Dr. Hiro Nonogaki at Oregon State University. Following three years of fellowship at the University of Nottingham with Prof. Michael Holdsworth, George was appointed as a Birmingham Fellow.

Teaching

BIO398 Plant Science for the 21st Century

BIOM26

Postgraduate supervision

Matthew Jackson MIBTP Student

George is currently accepting applications for postgraduate students to look at the relationship between gene expression and changes in plant cell shape.

Research

The lab is using a multi-disciplinary approach to understand how genes control changes in the shape of plant cells. By examining post-embryonic growth of the model plant species *Arabidopsis*, we seek to uncover the molecular machinery that underlies the decision making process of a cell to commence expansion and the mechanisms that drive these shape changes.

Towards this, two complementary methodologies are being integrated:

1) Inference of co-functional Gene Networks (how genes influence other genes)

2) Quantitative analysis of 3D cellular geometric changes (how plant cells grow in 3D)

Functional gene interactions that modulate cell shape change have been computationally inferred from publicly available gene expression data in the lab. These predicted functional gene interactions are being investigated using quantitative high resolution imaging. In this way, the effects of these gene interactions can be quantified within the context of 3D cell shape changes.

Other activities

Society for Experimental Biology

Member of the International Society for Seed Science

Publications

Bassel GW*, Stamm P, Mosca G, Barbier de Reuille P, Gibbs DJ, Winter R, Janka A, Holdsworth MJ, Smith RS* (2014) Mechanical constraints imposed by 3D cellular geometry and arrangement modulate growth patterns in the Arabidopsis embryo.***Proc Natl Acad Sci U S A.*** 111(23):8685-90

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Martínez-Andújar C*, Pluskota WE*, Bassel GW*, Asahina M*, Pupel P, Nguyen TT, Takeda-Kamiya N, Toubiana D, Bai B, Górecki RJ, Fait A, Yamaguchi S, Nonogaki H. (2012) The mechanisms of hormonal regulation of endosperm cap-specific gene expression in tomato seeds. ***The Plant Journal*** Mar 28. **PubMed (http://www.ncbi.nlm.nih.gov/pubmed/22458548?dopt=Abstract)** *Equal Contribution

Bassel GW*, Lan H, Glaab E, Gibbs DJ, Gerjets T, Krasnogor N, Bonner AJ, Holdsworth MJ, Provart NJ (2011) Genome-wide network model capturing seed germination revealscoordinated regulation of plant cellular phase transitions. ***Proc Natl Acad Sci U S A.*** 108:9709-14 * Corresponding author

Bassel GW*, Glaab E, Marquez J, Holdsworth MJ, Bacardit J. (2011) Functional network construction in Arabidopsis using rule-based machine learning on large-scale data sets. ***The Plant Cell*** 23:3101-16. * Corresponding author

Gibbs DJ, Lee SC, Isa NM, Gramuglia S, Fukao T, Bassel GW, Correia CS, Corbineau F, Theodoulou FL, Bailey-Serres J, Holdsworth MJ. (2011) Homeostatic response to hypoxia is regulated by the N-end rule pathway in plants. ***Nature*** 479(7373):415-8

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