

46th New Phytologist Symposium: [Stomata](#)

21–24 October 2024 | Kaifeng, China

Day 1 – Monday 21 October 2024	
15:00 – 15:25	Opening ceremony Welcome from <ul style="list-style-type: none"> • Henan University • Chun-Peng Song, Henan University • Alistair Hetherington, <i>New Phytologist</i> Editor-in-Chief, University of Bristol
15:25 – 15:30	Session 1, An overview of stomatal biology Chairs: Alistair Hetherington and Chun-Peng Song
15:30 – 16:15	Keynote: Dominique Bergmann, Stanford University, USA Learning from the past and anticipating the future in stomatal development Available to view on demand
17:00 – 17:30	James Clark, University of Bath, UK The origin and evolution of stomata Available to view on demand
17:30 – 18:00	Belinda Medlyn, Western Sydney University, Australia Stomata and global change Available to view on demand
Day 2 – Tuesday 22 October 2024	
	Session 2 Stomatal development Chairs: Hanna Hörak and Juan Dong
9:00 – 9:30	Hanna Hörak, University of Tartu, Estonia Stomatal form and function in the light side of the leaf Available to view on demand
9:30 – 10:00	Charles Anderson, Pennsylvania State University, USA The flexoskeleton: regulation of stomatal dynamics by guard cell walls Available to view on demand
10:00 – 10:15	Ido Nir, ARO, Volcani Institute, Israel Tomato stomatal development: diverse mechanisms of adaptive flexibility revealed by multi-species analysis
10:15 – 10:30	Xinyu Zhang, John Innes Centre, UK Cell size control during stomatal development in Arabidopsis
11:15 – 11:45	Suiwen Hou, Lanzhou University, China Clathrin-mediated endocytosis regulates stomatal development in Arabidopsis
11:45 – 12:15	Juan Dong, Texas A&M University, USA Precisions in space and time: polarity proteins during asymmetric division

12:15 – 12:30	Lea Berg, University of Bern, Switzerland Leveraging single-cell transcriptomics to discover new genes in grass stomatal development
12:30 – 13:00	On Sun Lau, National University of Singapore, Singapore Environmental Control of Stomatal Formation Available to view on demand
13:00	Flash talks <ul style="list-style-type: none"> • Nathanael Tan: Living under pressure: how guard cells cope with high inflation • Linsan Liu: Understanding the coordination of epidermal features in barley and wheat • Xin Yang: Priming of stomatal precursors by SPEECHLESS enables modulation of stomatal development by long-distance • Rini Rahiman: Role of TCP transcription factors in regulating stomatal development in Arabidopsis thaliana
14:20	Session 2 Stomatal development (continued) Chairs: Hanna Hörak and Juan Dong
14:30 – 15:00	Michael Raissig, University of Bern, Switzerland Making better pores - decoding the developmental blueprint of grass stomata
15:00 – 15:30	Sarah McKim, University of Dundee, Scotland, UK Waxing on about epidermal development: the interplay between adaptive epidermal features
15:30 – 16:00	Stuart Casson, University of Sheffield, UK Photoreceptor and photosynthetic regulation of stomatal development Available to view on demand
	Session 3: Stomatal movement – mechanisms Chairs: Yun-Kuan Liang and Andrea Polle
16:30 – 17:00	Rob Roelfsema, University of Wuerzburg, Germany ABA-induced stomatal closure through Ca²⁺-dependent and -independent signaling pathways.
17:00 – 17:15	Yuhang Chen, Institute of Genetics and Developmental Biology, CAS, China Mechanistic insights into phosphoactivation of SLAC1 in guard cell signaling
17:15 – 17:45	Michael Blatt, University of Glasgow, UK GROK - an intimate in a familiar landscape? Available to view on demand
17:45	Flash talks <ul style="list-style-type: none"> • Xue Zhang: Structural insights into GORK channel gating • Yoshiharu Mimata: Regulation of stomatal closure by TCA cycle metabolites in grapevine • Shogo Kuwayama: Exploration of PM H⁺-ATPase phosphorylation mechanism using stomatal opening inhibitors and their derivatives.

Day 3 – Wednesday 23 October	
Session 3: Stomatal movement - mechanisms (Continued) Chair: Yun-Kuan Liang and Andrea Polle	
9:00 – 9:30	Zhizhong Gong, China Agricultural University, China ZmHT1a maintains the turgor of guard cells, and negatively regulates ZmSLAC1 during ABA-induced stomatal closure in maize
9:30 – 9:45	Danilo Daloso, Federal University of Ceara, Brazil Disentangling the role of sucrose for stomatal movement regulation Available to view on demand
9:45 – 10:15	Agepati Raghavendra, University of Hyderabad, India The rise in pH of guard cells: An intriguing component of stomatal closure Available to view on demand
11:00 – 11:30	Diana Santelia, ETH Zurich, Switzerland Guard cell starch metabolism at the intersection of environmental stimuli and stomatal movements Available to view on demand
11:30 – 12:00	Yun-Kuan Liang, Wuhan University, China Understanding the genetic basis of stomatal morphogenesis and function Available to view on demand
12:00 – 12:15	Ashley Pridgeon, University of Bristol Stomata and seedling establishment: Sunlight and shade
12:15 – 12:25	Flash talks <ul style="list-style-type: none"> • Hoang Trang Dang: Unravelling the molecular mechanisms underlying the superior performance of grass stomata • Caroline Ivsic: Guard cell electrophysiology underpinning the evolution of light-induced stomatal opening • Taku Sakakibara: Functional analysis of the Raf-like kinase VIK involved in light-induced stomatal opening
Session 4: Stomatal responses to biotic and abiotic signals Chairs: Alistair Hetherington and Pengwei Wang	
13:55 – 14:00	
14:00 – 14:30	Toshinori Kinoshita, Nagoya University, Japan Light-induced stomatal opening and its effect on plant growth
14:30 – 14:45	Nattiwong Pankasem, University of California, San Diego, UK Warming temperature triggers stomatal opening by enhancement of photosynthesis and ensuing guard cell CO₂ sensing, whereas further temperature elevation open stomata via a different pathway
14:45 – 15:00	Tiancong Qi, Tsinghua University, China The NLR immune receptor ADR1 and lipase-like proteins EDS1 and PAD4 mediate stomatal immunity
15:00 – 15:15	Chao Han, Shandong University, China Sugar Signaling Regulates Light Induced Stomatal Opening Available to view on demand
15:15 – 15:45	Shouguang Huang, University of Wuerzburg, Germany Guard cells count cytosolic Ca²⁺ signals to regulate stomatal dynamics

15:45 – 15:55	Flash talks <ul style="list-style-type: none"> • Kishwar Shethi: How does elevated CO₂ regulate the stomatal aperture? Is it a balancing act? • Yanzhi Yang: The MicroRNA408-plantacyanin module regulates ROS homeostasis in the guard cells to balance plant growth and drought resistance • Shanshuo Zhu: Cell-type specific autophagy regulates the dynamics of pseudomonas syringae infection in Arabidopsis
16:30 – 17:00	Hannes Kollist, University of Tartu & Universite Paris-Saclay/INRAE, Estonia/France Ozone and CO₂ signalling in stomatal guard cells – a personal tribute to Jaakko Kangasjärvi Available to view on demand
17:00 – 17:15	Christoph-Martin Geilfus, Geisenheim University, Germany Unveiling the guard cell response: How a transient pH shift in the stomatal cavity orchestrates guard cell stress adaptation through proteomic and transcriptomic reprogramming
17:15 – 17:30	Yuh-Shuh Wang, University of Tartu, Estonia Regulation of CO₂-induced stomatal movements via HT1 communication between plasma membrane and chloroplasts
17:30 – 18:00	Li Zhang, Soochow University, China Role of stomata in plant-microbiota interaction

Day 4 – Thursday 24 October	
Session 5: Manipulating stomata to improve crop traits Chairs: Julie E. Gray and Shuhua Yang	
9:00 – 9:45	Keynote: Chun-Peng Song, Henan University, China Identification and mechanism analysis of a heat sensor governing guard cell movement in Arabidopsis
9:45 – 10:15	Julie E. Gray, University of Sheffield, UK Manipulating stomata to enhance stress tolerance
10:15 – 10:45	Tracy Lawson, University of Essex, UK Red and blue light impacts on stomatal dynamics, photosynthesis and water use efficiency
11:15 – 11:45	Lizhong Xiong, Huazhong Agricultural University, China High throughput phenotyping promotes drought resistance gene discovery in rice
11:45 – 12:00	Jodie Armand, University of Sheffield, UK Live 3D imaging sheds new light on the cellular mechanics of stomatal movement in Arabidopsis thaliana
12:00 – 12:30	Shuhua Yang, China Agricultural University, China Molecular and genetic basis of cold tolerance in maize Available to view on demand

Post Event webinar – [Available to view on demand](#)

Sally Assmann, Pennsylvania State University
Heterotrimeric G protein regulation of guard cell signaling

Keiko Torii, The University of Texas at Austin
Harnessing synthetic chemistry to probe and design plant stomatal development