NUS National University of Singapore | Department of Biological Sciences, Faculty of Science

SEMINAR

Mon, 7 Nov 2016 | 3pm | DBS Conference Room 1

Hosted by Prof Prakash Kumar

The WRINKLED1 orchestra: Who sets the tone?



By Dr Wei Ma

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Plant cells accumulate oil in the form of triacylglycerol (TAG) in their seeds as a main resource of carbon and energy for seedling development. Plant oils are not only important for the human diet but also for the industry as renewable feed stocks. WRINKLED1 (WRI1), a member of the APETALA2 (AP2) family of transcription factors, is one of the most important regulators in plant oil biosynthesis and seed development. However, key aspects of the structure/function relationship of WRI1, e.g. posttranslational modifications, interacting partners, and regulatory domains (or motifs), remain largely unknown. My recent work identified three intrinsically disordered regions (IDRs) in Arabidopsis WRI1. I found that C-terminal IDR3 domain (containing a PEST motif) mediates the stability of AtWRI1. Removal of the IDR3-PEST motif or mutation of its putative phosphorylation-sites in the IDR3-PEST motif increases the stability of AtWRI1, resulting in increased oil production. In addition, I demonstrated that AtWRI1 interacts with 14-3-3s, a family of phosphopeptide-binding proteins. Co-expression of 14-3-3s with AtWRI1 leads to increased AtWRI1-mediated oil biosynthesis and enhanced the transcriptional activity of AtWRI1. My presentation will highlight the latest advances in mechanistic understanding of WRI1, and outline my future plan aimed at elucidating the effects of environment signals and posttranslational modifications on WRI1-mediated plant oil biosynthesis and seed development. I will also touch upon my approaches to investigate combinatorial transcriptional regulation by WRI1 and other factors; as well as an introduction of new oil crop opportunity. .

Faculty Search Candidate in Plant Biology

Artwork by Ann Koo, DBS, NUS