FST Lunchtime Seminar

Plant Secondary Metabolism: Identifying Biosynthetic Pathways and Genes for Plant Secondary Metabolites

By Dr. Jang In-Cheol

Host: Prof. Zhou Weibiao
Date: 26th April 2016, Tuesday
Time: 12-1pm
Venue: S8-03-14 Executive Classroom

Abstract

Plants produce a large variety of secondary metabolites (SMs) that have ecological functions for their defence against herbivores and pathogens as well as for the pollinator attraction. Plant SMs are mainly composed of terpenoids, phenylpropanoids/benzenoids, and volatile fatty acid derivatives, which are derived from different biosynthetic routes in plants. Among these SMs, terpenoids are the primary constituents of essential oils of many types of aromatic plants and flowers, and are widely used in the pharmaceutical and food industries as medicines, flavour enhancers and fragrances.

The diversity of plant SMs has stimulated broad systems biology approaches to identify the pathways/genes involved in their biosynthesis. Here, we integrate metabolome and transcriptome analysis of aromatic plants/flowers to unravel biosynthetic pathways for SMs. Our metabolite-guided transcriptomics and molecular and biochemical characterization of genes have been identified specific gene members encoding enzymes involved in the biosynthesis of diverse terpenoids and phenylpropanoids. Moreover, our understanding of the biosynthetic pathways of SMs has facilitated the enhanced production of high-value terpenes in plant. In this lunchtime talk, I also show comparative transcriptomics and metabolomics of stevia plant to understand biochemical specialization of leaf tissues for diterpenoid production.

About the speaker

Dr Jang In-Cheol is a Principal Investigator of Temasek Life Sciences Laboratory (TLL), Singapore. Dr Jang received his Ph.D. from Myongji University, Korea in 2002. He joined Nam-Hai Chua's lab at the Rockefeller University in 2003 first as a post-doctoral fellow (2003-2008) and subsequently as a research associate (2008-2012), where he investigated and unravelled mechanisms regulating light signalling in plants. Since August 2012, he has been leading the Plant Metabolic Biology Group at TLL. His lab research integrates molecular, genetic, genomic and biochemical approaches to explore biosynthetic capacity of aromatic plants/flowers for secondary metabolism. His research interests lie in plant secondary metabolism; functional genomics in aromatic plants; development of new methods for enhanced production of high-value compounds in plants; plant metabolic engineering for high-value compounds.