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TEMASEK LIFESCIENCES LABORATORY

21 February 2017 (Tuesday), 11am
The Auditorium (Level 1)
Hosted by: Dr Sarojam Rajani

How plants learned the defend themselves – evolution of specialized metabolism in secretory structures

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Secretory structures in terrestrial plants appear to have first emerged as intracellular oil bodies in liverworts. In vascular plants, internal secretory structures, such as resin ducts and laticifers, are usually found in conjunction with vascular bundles, whereas subepidermal secretory cavities and epidermal glandular trichomes generally have more complex tissue distribution patterns. The primary function of plant secretory structures is related to defense responses, both constitutive and induced, against herbivores and pathogens. The ability to sequester secondary (or specialized) metabolites and defense proteins in secretory structures was a critical adaptation that shaped plant-herbivore and plant-pathogen interactions. In my presentation, I will introduce innovative approaches and concepts that have been developed to understand metabolism in secretory structures, with an emphasis on medicinal and aromatic plants.

The Lange laboratory has long-term interests in furthering our understanding of the evolution of chemical diversity in plants. Dr. Lange and colleagues have developed single cell technologies for transcriptomics, proteomics and metabolomics, and have generated various web-based resources for integrating these complex data sets.

Recent Publications:

1. Vining KJ, Johnson SR, Ahkami A, Lange I, Parrish AN, Trapp SC, Croteau RB, Straub SC, Pandelova I, **Lange BM** (2016) Draft genome sequence of *Mentha longifolia* (L.) and development of resources for mint cultivar improvement. *Mol. Plant*, in press. doi: 10.1016/j.molp.2016.10.018.
2. Srividya N, Davis EM, Croteau RB, **Lange BM** (2015) Functional analysis of (4S)-limonene synthase mutants reveals determinants of catalytic outcome in a model monoterpene synthase. *Proc. Natl. Acad. Sci.* USA 112, 3332-3337.
3. **Lange BM** (2015) The evolution of plant secretory structures and emergence of terpenoid chemical diversity. *Annu. Rev. Plant Biol*. 66, 139-159.