PhD DEFENSE

TEMASEK LIFESCIENCES LABORATORY



Mr Choi Kin Yuen Ian

Dr Jang In-Cheol Group

17 Feb 2023, Fri

11am

The Auditorium

**Scan for address*

All Are Welcome!

Roles of *Arabidopsis* HFR1 and HY5 in shade avoidance and chlorophyll biosynthesis

Light is crucial for plants and serves as a signal for modulating their growth. Under shade, where red to far-red (R:FR) light ratio is low, plants exhibit shade avoidance responses (SAR). *LONG HYPOCOTYL IN FAR-RED 1* (*HFR1*) and *ELONGATED HYPOCOTYL 5* (*HY5*) are negative regulators of SAR and physically interact with one another, though this association has not been explored. To elucidate the significance of this relationship, tissue-specific transcriptome analysis was performed, which revealed that genes co-regulated by HFR1 and HY5 were enriched in processes related to cell wall. Through further comparison with HY5 target genes, genes such as *SULFOTRANSFERASE 2A* (*ST2A*) and *WALLS ARE THIN1* (*WAT1*) were identified to be directly regulated by HFR1 and HY5. We further demonstrated how HFR1 and HY5 suppress *WAT1*, to reduce auxin levels and inhibit cell elongation, as well as suppress *ST2A* to modulate jasmonic acid (JA) metabolism for increased defense. In addition, we also delved into chlorophyll biosynthesis and uncovered that HFR1 regulate chlorophyll biosynthesis through suppression of PHYTOCHROME-INTERACTING FACTOR 1 activity. This study provides a deeper insight into the interaction of HFR1 and HY5 as a module to influence photomorphogenesis in *Arabidopsis*.