

Thursday, 6th April 2023
 CET 16:00 - 17:00
 IBL 1.05.31

followed by a reception w/ drinks @IBL 1^e floor

A **Spotlight** Lecture under the theme of **Disease & Development**
 & supported by the Graduate School of **Experimental Plant Sciences (EPS)**

Prof. Wenbo Ma  @wenboEffector

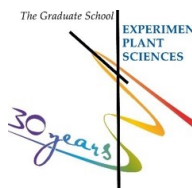
The Sainsbury Laboratory (TSL), Norwich, UK

Modularity-driven diversification of pathogen effectors

The dynamic interplay between a pathogen's virulence factors and a host's immune system determines whether the disease will occur. Understanding the molecular mechanisms underlying the host-pathogen arms race is essential for developing durable disease resistance. Plant pathogens have evolved a large and diverse complement of virulence proteins called effectors, which, collectively, are indispensable for disease development. *How functional diversity is generated in an effector repertoire is poorly understood.* Our research aims to **understand the molecular mechanisms that promote effector evolution using the devastating *Phytophthora* pathogens as a model.** We found that many *Phytophthora* effectors contain tandem repeats of the "(L)WY" motif, which are structurally conserved but variable in sequences. Individual (L)WY units are concatenated in the effectors through a conserved mechanism. We have evidence that (L)WY motifs are functional modules with specific unit or unit combinations mediating interactions with specific host target(s). In particular, we discovered an (L)WY-LWY module in multiple *Phytophthora* effectors, which efficiently recruit a protein phosphatase core enzyme in plant hosts, allowing the formation of functional effector-phosphatase holoenzymes. While sharing the phosphatase-interacting module at the Amino terminus, these effectors possess divergent C-terminal LWY units and regulate distinct sets of phosphoproteins in the host. These findings highlight the appropriation of an essential host phosphatase as a pathogen innovation through molecular mimicry. More importantly, we show how protein modularity can promote functional diversification, which may create novel activities.



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Disease & Development



Seminar Series for **Plant Stress Biology (PSB)**, Leiden
 Groups of Dr. **Salma Balazadeh** & Dr. **Pingtao Ding**