

Biology Seminar

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Modularity-driven diversification of pathogen virulence proteins



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The dynamic interplay between virulence factors of a pathogen and the immune system of a host determines whether disease will occur. A deep understanding of the molecular mechanisms that underlie host-pathogen arms race is essential for developing durable resistance. Pathogens have evolved a large and diverse complement of virulence proteins, called effectors, which, collectively, are indispensable for disease development. An important feature of effectors is their fast evolution driven by adaptation towards a host. One of our research focuses is to understand the molecular mechanisms underlying effector evolution. We recently defined a structural module called LWY in effectors

of *Phytophthora*, which are devastating pathogens of plants. Hundreds of *Phytophthora* effectors harbour the LWY units as tandem repeats and form a unique linear structure. I will discuss our current investigations on understanding how LWY units are functional modules with a specific unit or unit combination mediating interaction(s) with specific host target(s). As such, the LWY units may serve as building blocks that promote functional diversification in effector repertoires and may lead to the evolution of novel virulence activities.