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## Structure and function of a bacterial phytochrome involved in virulence

Phytochromes constitute a major superfamily of light-sensing proteins that are reversibly photoconverted between a red-absorbing (Pr) and a far-red-absorbing (Pfr) state. These photoreceptors can be found in plants, eukaryotic algae, fungi, and photosynthetic and non-photosynthetic prokaryotes. To date, several phytochromes have been biophysically characterized. However, it is still not fully understood how structural changes are propagated from the photosensory module to the output module during the signal transduction event. Phytochromes were originally discovered in plants where they regulate many key processes, however their bacterial homologues, bacteriophytochromes (BphP), were then identified but most of the BphPs biological processes they regulate are still elusive.

In this seminar I will talk about our work on the structural features and the physiological role of the BphP from the plant pathogen *Xanthomonas campestris* (*Xcc*BphP). Our studies suggest that the photoconversion between the Pr and Pfr states in the full-length *Xcc*BphP involve changes in the relative positioning of the output module. Moreover, our findings indicate that *Xanthomonas* senses light through *Xcc*BphP, eliciting bacterial virulence attenuation via downregulation of bacterial virulence factors.

In summary, I will present the data and the models for the *Xcc*BphP light-induced structural changes, and the light-dependent *Xcc*BphP virulence attenuation mechanism for the pathogen *Xanthomonas campestris*.