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Crystal structures and molecular mechanism of light-induced signaling switches

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Since light is an important environmental variable, many organisms have evolved signalling pathways that transmit and thereby translate this stimulus into various biochemical activities. Recently, new classes of blue light photoreceptors have been identified that use flavin based photosensors. The photosensor domains are coupled to an array of other domains, including kinases and transcription factors. Recent progress in understanding the mechanism of blue-light signaling will be presented based on crystal structures of dark states and light-induced photopoducts. The structures are interpreted in the light of the spectroscopic data and used as a basis for quantum chemical calculations to obtain insight in the reaction mechanism. It will be presented and compared to previously suggested mechanisms.