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Optical coherent control of biological electron transfer

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Optical control of dynamic processes has been challenging yet has been demonstrated in several chemical and biological systems. The control of a reaction passing the widely present conical intersection has not been realized. Here, we can modulate the phase of the excitation pulse to achieve control of an important chemical process, the dynamics of β -carotene to access the conical intersection (CI). We then report for the first time on the optical control of electron transfer (ET) processes in a protein flavodoxin. Such successful demonstration of optical coherent controlled CI and ET in the chemical and biological systems is significant to opening a new direction, especially to control a variety of ET processes in chemical and biological systems.

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