

Examination of biologically relevant electron transfer in photolyases with ultrafast laser spectroscopy

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In the last few decades an enormous technological expansion could be seen in the field of lasers. This resulted in the application of basically biophysical methods in the every day medicine, methods like super-resolution microscopy, CARS microscopy, Raman-spectroscopy and even ultrafast laserspectroscopy. With the help of ultrafast laser spectroscopy the recording of intramolecular procedures became possible even on the scale of femtoseconds. Several, biologically relevant processes are known that take place within this scale. Such example is the photoisomerisation that means the basics of vision or the redox potential changes in photolyases and cryptochromes leading to their proper functioning. We have been focusing on the ultrafast laser spectroscopic features of these latter two proteins. They are phylogenetically connected, however photolyase is a DNA repair enzyme while cryptochrome is the member of the group of proteins composing the circadian clock. The explanation for such different functions so far from each other lays in the understanding of the procedures happening intramolecularly on the scale of picoseconds.