Tata Institute of Fundamental Research
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Internal Seminar

Deep UV Initiated Excited State Dynamics of Flavins

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Flavins are a broad class of chromophores that act as photoreceptors in blue light activated enzymes, such as DNA-photolyase, cryptochromes, blue-light-using-FAD (BLUF) and light-oxygen-voltage (LOV) domains. Photophysics of flavin compounds has been the subject of intense research due to the intriguing role of its electronic excited states in several photochemical and photobiological processes. Such processes include DNA damage repair, regulation of circadian rhythm in plants and higher animals, and also control of the photosynthetic movement of microorganisms. Earlier studies were primarily focused on the photophysics of the oxidized and reduced forms of flavins generated upon excitation by visible (~430 nm) light. However, the response of these molecules to the harmful radiation such as ultraviolet (UV)/deep UV has never been investigated in detail to the best of our knowledge. Through a comprehensive resonance Raman experiments, theoretical calculations and classical wave-packet dynamics simulations, we have determined the sub-100 femtosecond structural dynamics of flavins upon photoexcitation to their 266 nm excited state. We have also found an ultrafast solvent dynamics timescale of <30 fs for all of the flavins.

Monday, Feb 25th 2019

2:30 PM (Tea/Coffee at 2:00 PM)

Seminar Hall, TIFR-H