

HIGH-SPEED FLUORESCENCE MICROSCOPY TO STUDY DYNAMIC CELLULAR PROCESSES *IN VIVO*

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Human cells contain more than 10,000 different proteins and 4,000 metabolites, which are involved in thousands of biochemical reactions. Although the biochemical pathways in which these reactions are involved to sustain life processes of the human body are well studied, little is known about their kinetics in living cells. Deviations from the normal kinetics of single biochemical process can lead to pathological changes in the human body. We use high-speed fluorescence microscopy to study the dynamics of the repair of DNA damage in living cells. This allows us to study the coordination in time and space of different biochemical pathways, through which effective repair of complex DNA lesions is achieved. Disclosing this would lead to better understanding of the process of repairing complex DNA lesions and will facilitate development of more rational and effective therapies for the treatment of cancer patients.