The interaction of light with biological molecules is very important in a variety of processes, such as vision, photosynthesis, and photochemical damage and repair in DNA. Theoretical studies can help us understand the underlying photophysical or photochemical processes. The fate of molecular systems when they interact with photons is almost always affected by nonadiabatic processes, and a major part of our work is focused on understanding the fundamentals of these processes. We have investigated the importance of nonadiabatic effects in a variety of systems, and particularly biological chromophores. A major component of our research focuses on understanding the photophysical and photochemical properties related to DNA damage. DNA absorbs UV radiation which sometimes may lead to photochemical products and damage. Consequently, understanding the behavior of the electronically excited states is very important. In the talk we will discuss the fundamentals of describing photoinitiated processes and insights we have obtained, focusing on biological chromophores.