Porphyrrins have been of interest for a variety of chemical and biological processes. In particular, the heme is the prosthetic group in many proteins such as cytochromes P450, hemoglobin, heme peroxidases. There is a great deal of evidence demonstrating that the biological activity of the hemoproteins is controlled by the conformational and electronic properties of their active site.

To acquire a deeper knowledge of the ultrafast processes occurring in biological complex systems, it is helpful to investigate on how porphyrin, both as free base and as metal complex, behaves on its own. We have studied the relaxation dynamics of hemin and protoporphyrin IX in solution by means of UV-vis transient absorption spectroscopy. Upon excitation in the Soret band with pulses of ~100 fs duration, the decay processes at delay times up to 2 ns have been determined and discussed by comparison with the model proposed for the parent porphyrin (1). The results offer the possibility to argue the nature of the short lived states generated after hemoprotein photoexcitation. Finally, the time-resolved behavior of the truncated hemoglobin from Thermobifida fusca (2) are presented.


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