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Investigating 7-Dehydrocholesterol ring-opening dynamics as a function of liposome properties DANIELLE SOFFERMAN, ROSEANNE SENSION, Univ of Michigan - Ann Arbor — 7-Dehydrocholesterol (DHC, Provitamin D_3) undergoes an ultrafast photochemical transformation into previtamin D_3 upon a ring-opening reaction in the excited state. A cyclohexadiene (CHD) chromophore embedded within the DHC molecule opens to form a hexatriene previtamin D_3 species. The ring opening of isolated CHD happens on a sub-picosecond time scale, therefore it is necessary to use ultrafast techniques such as transient absorption to capture the dynamics of the DHC molecule in the excited state. Here we are studying the excited state dynamics of DHC in liposomes as a model for biologically relevant skin membranes. In isotropic solvents, the molecule is free to isomerize to previtamin D_3, however in an anisotropic solvent such as liposomes, the DHC molecule resides in a lipid bilayer and the isomerization is hindered by the lipid tails. We have observed that the excited state absorption of DHC in isotropic solvents yields a 0.5ps fast component and a 1-2ps slow component. In the anisotropic liposomes a third, longer lived, 6-10ps component is also observed. These results will be discussed in terms of the conformational relaxation of DHC.

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