

Abstract Submitted  
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**Novel Photo-Protecticon Mechanisms in Chlorosomes from Green Sulfur Bacterium *Chlorobium Tepidum*** HANYOUP KIM, SERGEI SAVIKHIN, Department of Physics, Purdue University, West Lafayette, IN 47907, HUI LI, JULIA MARESCA, DONALD BRYANT, Department of Biochemistry and Molecular Biology, The Pennsylvania State University, University Park, PA 16802 — Chlorosome is the largest known photosynthetic light-harvesting antenna complex that incorporates thousands of bacteriochlorophylls (BChl) and carotenoids (Car) in a closely packed quasi-regular structure. BChl is known to produce highly toxic singlet oxygen as the result of energy transfer from their excited triplet states to oxygen molecules. It has been proposed that the carotenoids in chlorosome serve both light harvesting and photo-protection functions, transferring light excitations to nearby BChl and simultaneously quenching excited triplet state of BChl. However, experiments indicate that photoprotective role of carotenoids in chlorosomes is not as extensive as expected—photo-degradation of carotenoid-free mutants occurs only twice faster than photo-degradation of native complexes. An additional non-conventional photoprotection mechanism must exist in chlorosomes. The possible nature of this mechanism is discussed based on optical kinetic measurements of BChl and Car excited states.

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