

# THE B850 / B875 PHOTOSYNTHETIC COMPLEX IS COHERENT

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## Abstract

If a bacterial photosynthetic light-harvesting complex absorbs a photon, the energy transfer to a charge separation (CS) complex some distance away is nearly perfect. Recent experiments have obtained evidence that coherence is present in the CS complex [1]. Some suggest that coherent excitons that supply this energy are coherent, but the mass is too high for this phenomenon to occur at room temperature (RT). However, combining photosynthetic excitons with photons reduces the mass so a polariton [2, 3, 4] condensate can form at RT [5]. Coles et al. have reported strong polariton coupling between isolated photosynthetic chlorosomes and confined optical photons in a microcavity [6]. We discuss an unusual feature present in the B850 / B875 complex that provides proof that coherence is an intrinsic property of the complex. Polaritons may have been observed in native bacteria.

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