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Coherent Excitonic Transfer in the Fenna Matthews Olson Complex GREGORY ENGEL, The University of Chicago — Evidence for a purely quantum mechanical mechanism of energy transfer in photosynthetic complexes was discovered in the Fenna-Matthews-Olson complex of *Chlorobium tepidum in 2007*. The quantum beating phenomenon observed in this complex is now much better understood. Specifically, detailed, testable microscopic models for the mechanism of this energy transfer have emerged, and precise quantum dynamical models now predict that this mechanism accounts for approximately one quarter of the energy transferred at room temperature. Further, new data indicate that this mechanism is not specific to FMO, but manifests in reaction centers of purple bacteria and antenna complexes of higher plants. A new experimental effort to observe quantum coherence at room temperature will be discussed. Specifically, by comparing population transfer rates and coherence transfer quantum beating signals, we caluclate the fraction of the energy moving through the wave-like mechanism. Further, by studying the temperature dependence of the energy transfer, we elucidate the microscopic mechanism for wavelike energy transfer and be able to comment on the robustness of the mechanism. Are light harvesting proteins delicately "tuned" by evolution to support coherence transfer or should any proteinaceous environment support this mechanism? Details of the experimental apparatus, results and future experiments will be presented.

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