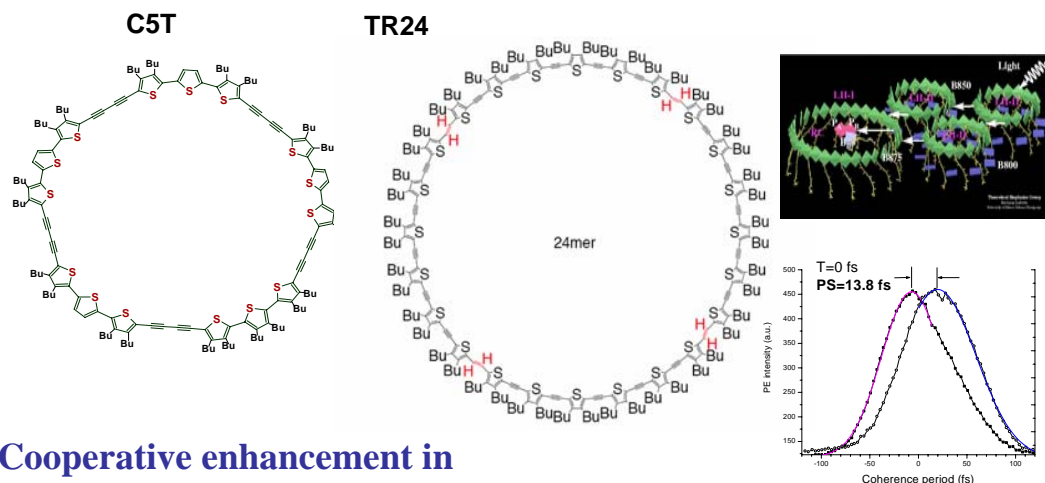


Taking advantage of strong coupling and coherent superposition states in novel Artificial Light Harvesting Systems

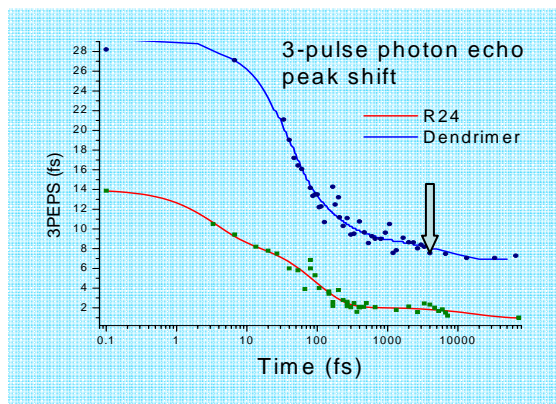
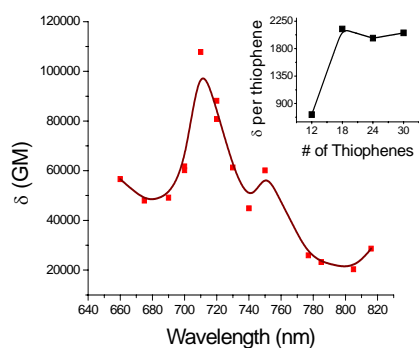
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Background



Delocalized states and energy transfer between delocalized and localized states play a crucial role in efficient light harvesting. Although ring molecular aggregates are well known to play a crucial role in very efficient natural photosynthetic systems the artificial light harvesting systems possessed different morphologies so far due to synthetic difficulties. Recently developed artificial giant macrocycles give us a unique opportunity to learn more about the structure-property relationship in artificial ring systems by variation of different ring parameters which was not possible to obtain from the natural systems such as electronic delocalization, role of planarity, optimal number of building blocks in the ring.

Cooperative enhancement in TPA- response of giant Macrocyces:

3-pulse photon echo in giant Macrocyces:



Results and Broader Impact

- Photon echo results showed that C5T has much higher dephasing rate than TR24 while the dynamics of TR24 is slower than for C5T and resembles that for natural LH2.
- C5T, TR24 possess much lower conformational diversity (inhomogeneous broadening) as compared to the dendrimer
- These materials are great candidates for artificial harvesting systems and are great tools for getting younger students (undergrad and high school) to work on related projects with such important applications.

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