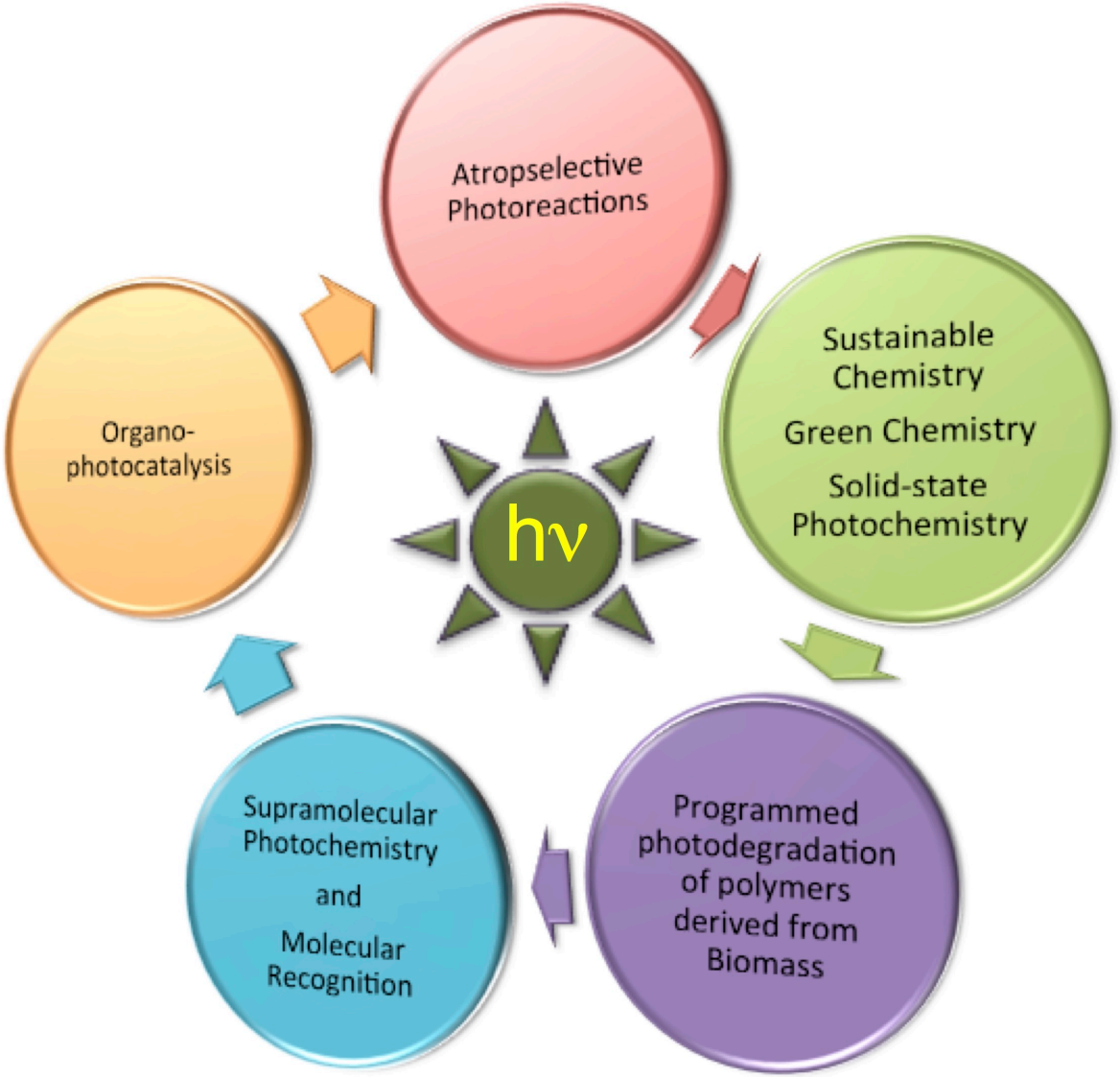
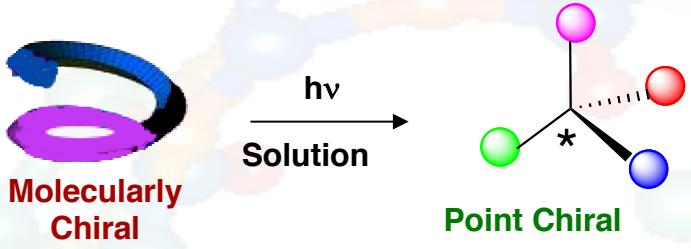
Sivagroup – Currrent Research Themes / Interest



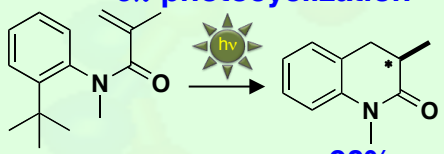
Atropselective Photoreactions with UV and/or Visible light

Molecular to Point Chiral Transfer



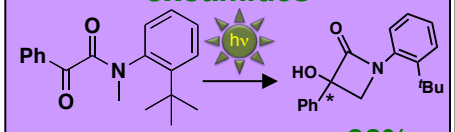
- Reactions from Excited state
- Can be performed in gram scale under flow
- Methodology for accessing enantiopure products

6π-photocyclization



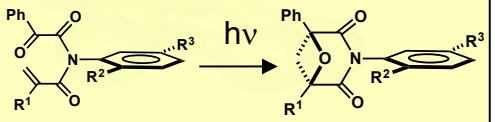
ee > 90%

γ-Hydrogen abstraction of oxoamides



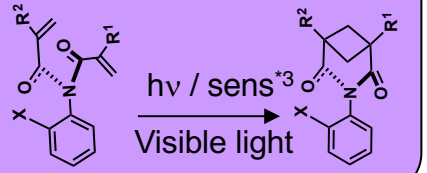
ee > 90%

Paterno-Buchi reaction

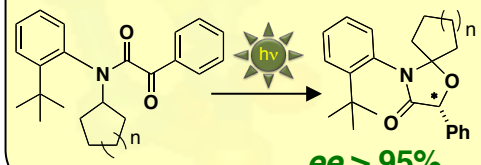


ee = 98%; dr. 85:15

Cross-photocycloaddition

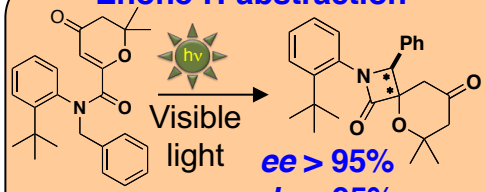


Norrish Type II reaction



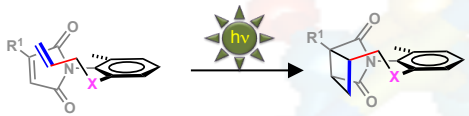
ee > 95%

Enone-H-abstraction



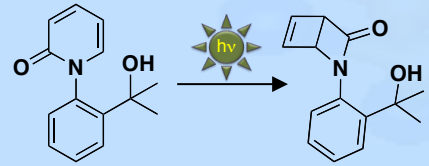
ee > 95%
de > 95%

[2+2]-photocycloadditon



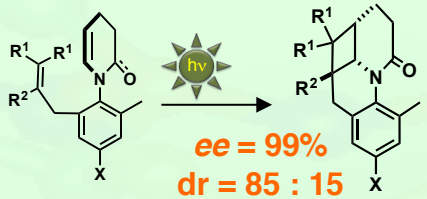
ee > 95%; *de* > 95%

4π-photocyclization

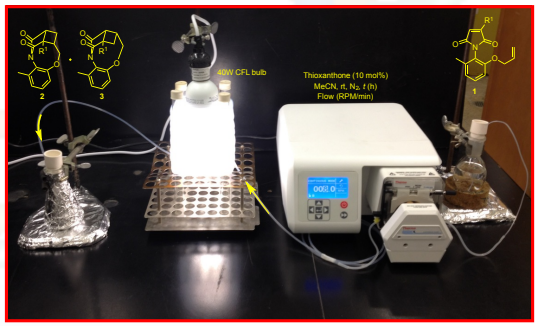


ee > 95%

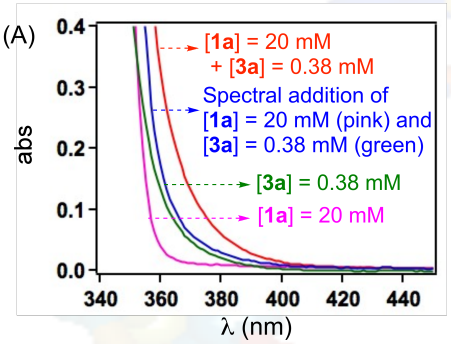
[2+2]-photocycloadditon

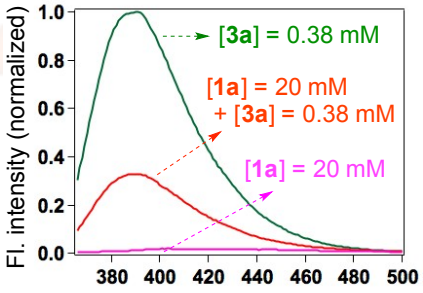


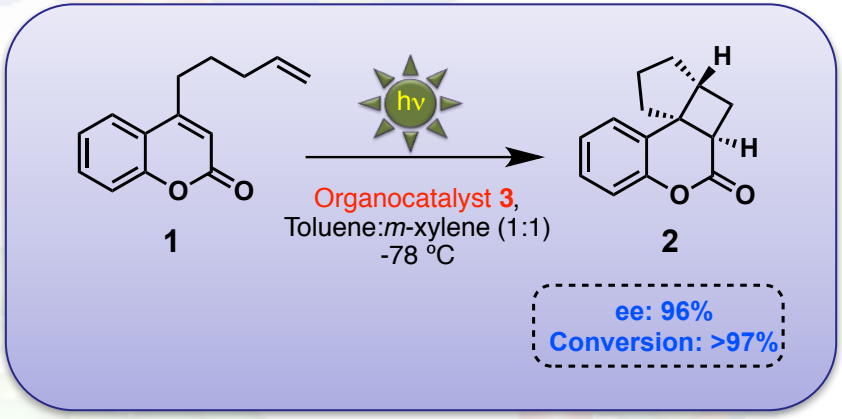
ee = 99%
dr = 85 : 15

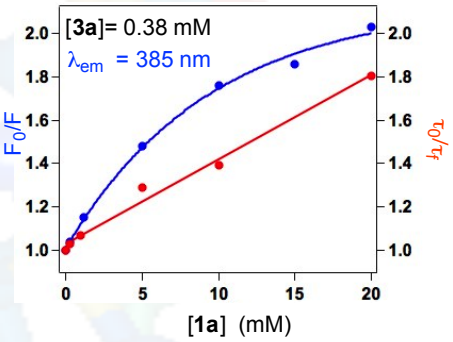


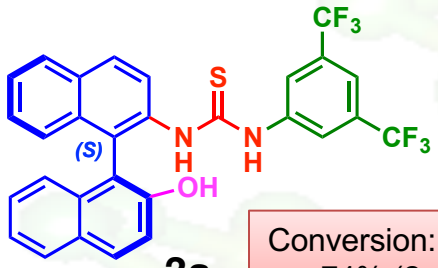
Enantioselective Organophotocatalysis





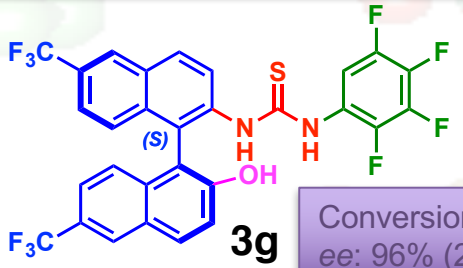






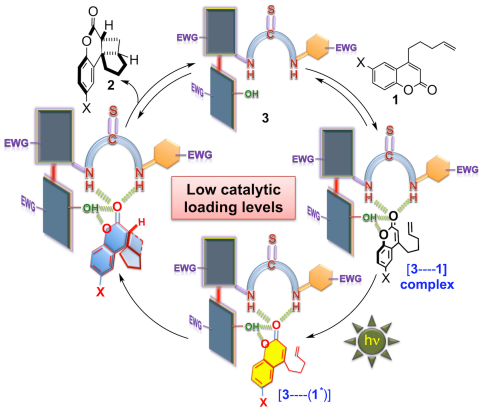
3a

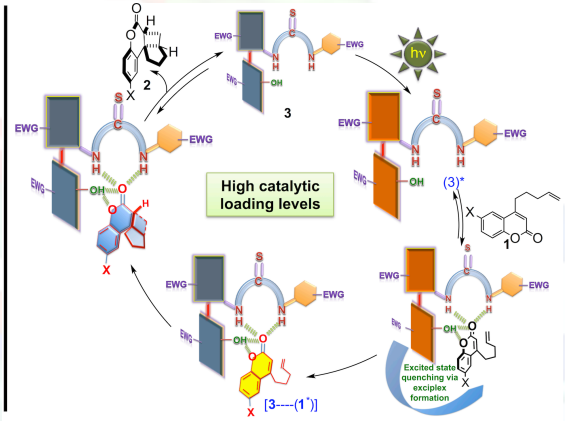
Conversion: 84%
ee: 74% (2a)



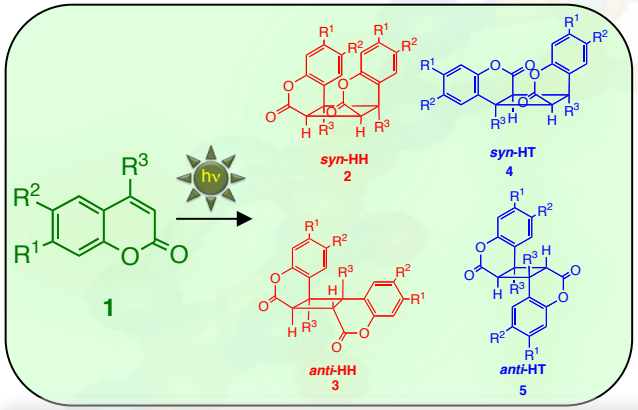
3g

Conversion: 100%
ee: 96% (2a)

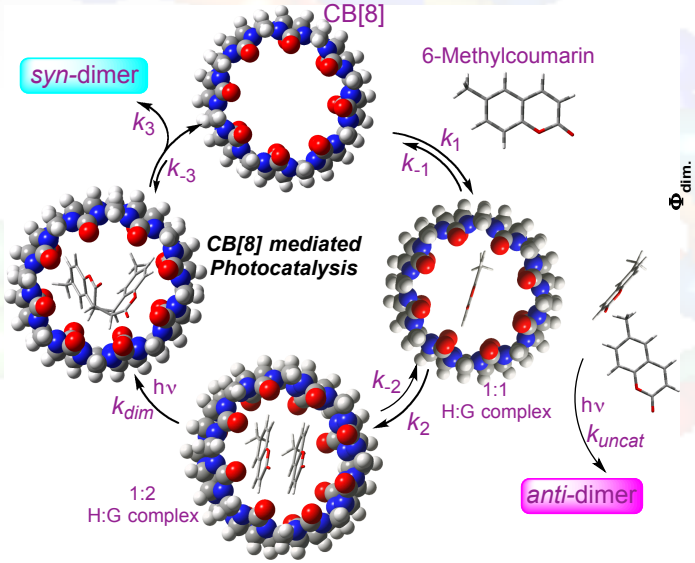


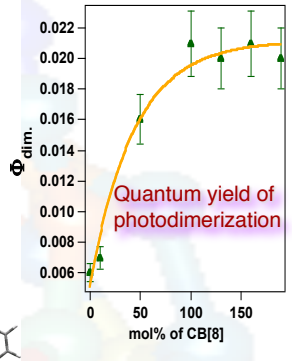


Supramolecular Photocatalysis



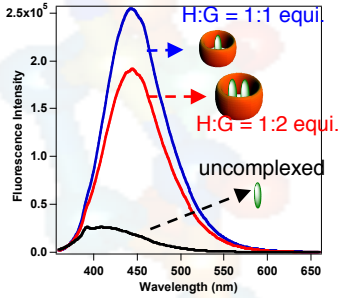
Supramolecular Photocatalysis using sunlight

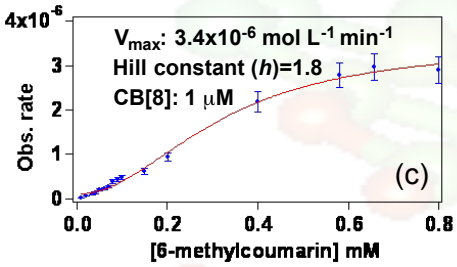


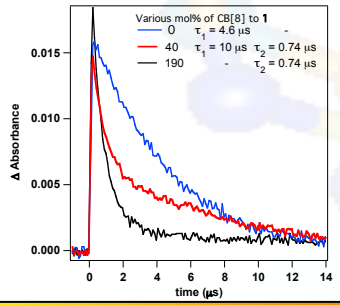


Isotropic media (benzene): *anti* dimer

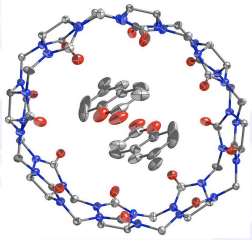
CB[8] / H_2O Only *syn* dimer (*syn*/*anti* > 99)

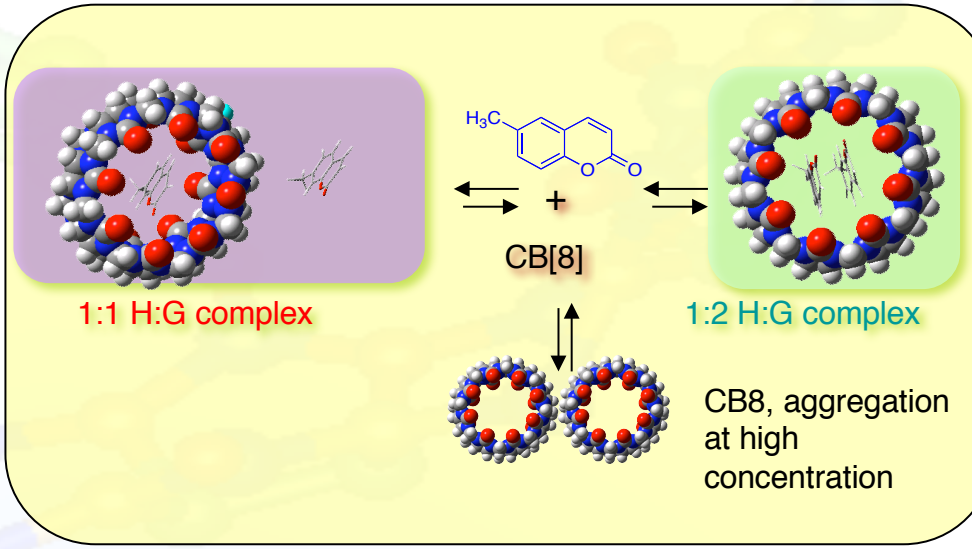






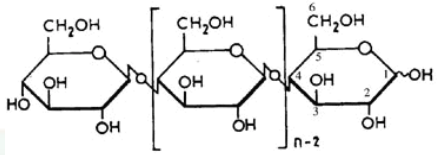
Allosteric response



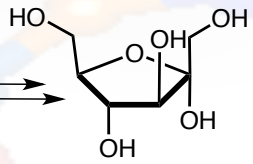


Programmed Degradation of Polymers Derived from Biomass

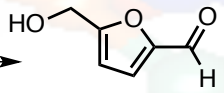
Biomass-
renewable source



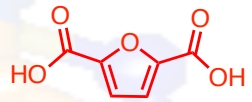
Cellulose



Fructose



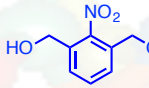
HMF

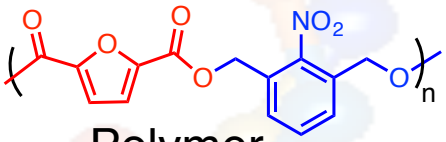


Furandicarboxylic acid
(FDCA)

(i) $SOCl_2$, benzene,
cat. DMF, reflux 2 h

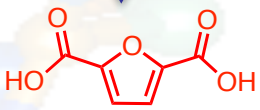
(ii) Et_3N, DCM, 12 h





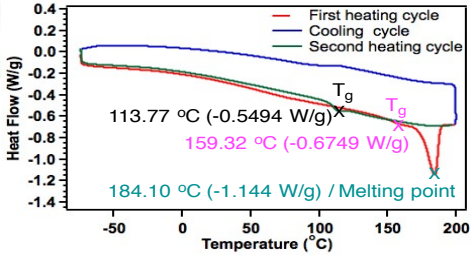
Polymer

hν

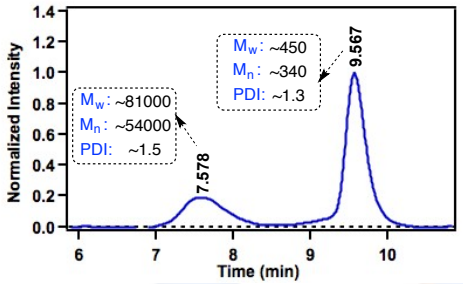


~40% monomer
recovered.

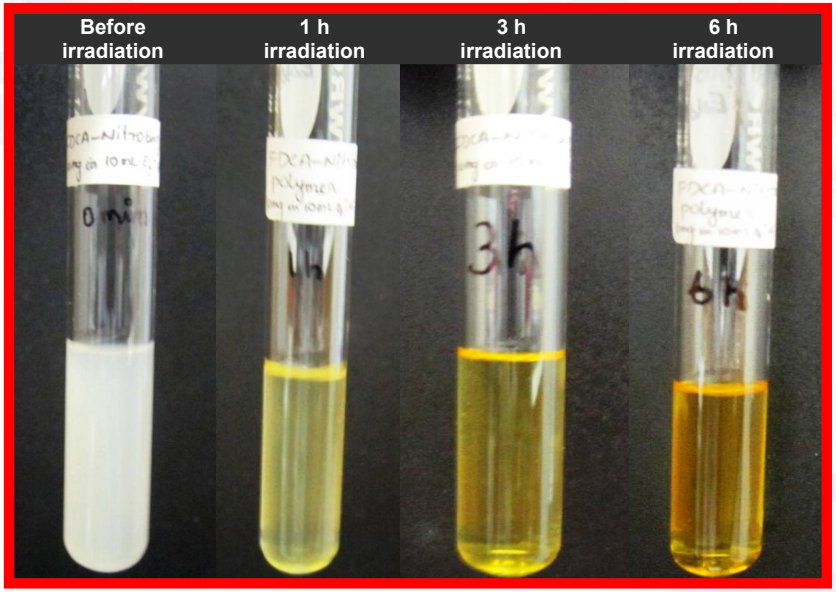
DSC of oligomer/polymer



GPC traces of oligomer/polymer

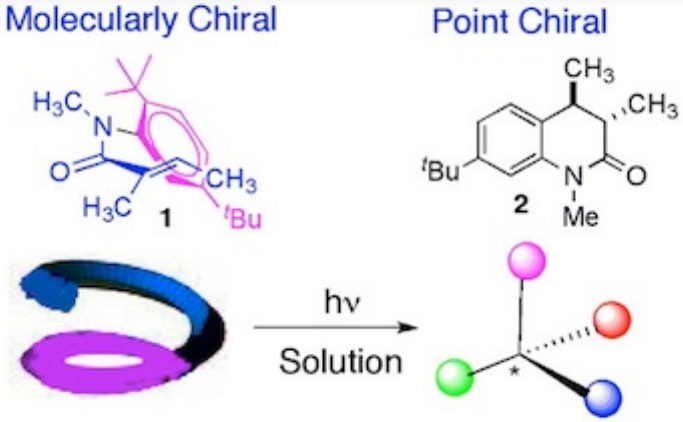


Before irradiation	1 h irradiation	3 h irradiation	6 h irradiation

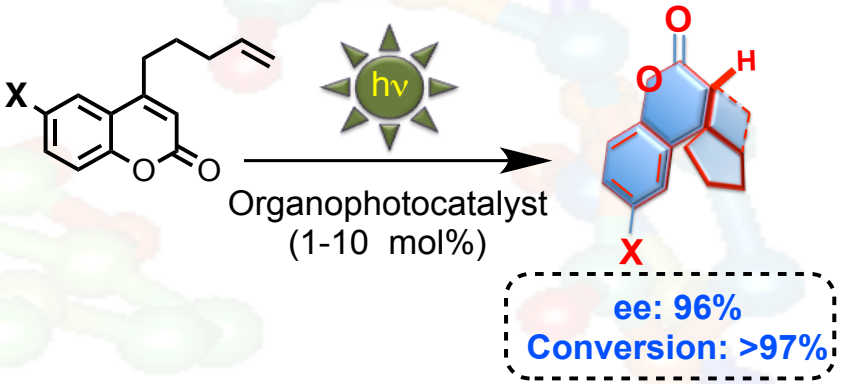


Sivagroup Research Themes Summary

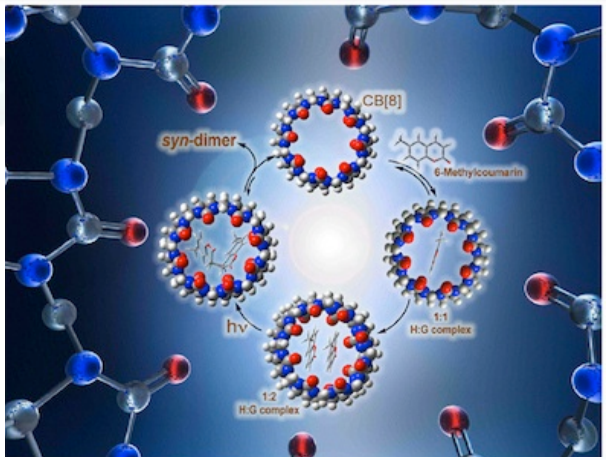
Enantiospecific light induced transformations in solution



Organophotocatalysis



Supramolecular photocatalysis



Programmed photo degradation of bio-based polymers / renewable materials