

ENANTIOSELECTIVE CATALYSIS OF PHOTOCHEMICAL REACTIONS

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The creation of chirality is one of the most fundamental challenges in synthetic organic chemistry. Our group has worked for some time on enantioselective catalytic photochemical reactions [1] mediated by triplet energy transfer and by chromophore activation. The first approach is based on a triplet energy transfer by chiral hydrogen-bonding catalysts [2] which in turn are derived from a previously described template. The second approach relies on the use of Brønsted or Lewis acids which change the photophysical properties of the chromophore [3] and ideally allow for a selective excitation in the chiral environment they provide. Beyond [2+2] photocycloaddition chemistry, our studies are directed towards photochemical rearrangement and deracemization reactions with a potential for synthetic applications. The background of the above-mentioned experiments will be discussed and the latest results of our research efforts in this area will be presented.

[1] Review: R. Brimiouille, D. Lenhart, M. M. Maturi, T. Bach, *Angew. Chem. Int. Ed.* **2015**, *54*, 3872.

[2] Recent example: A. Hölzl-Hobmeier, A. Bauer, A. V. Silva, S. M. Huber, C. Bannwarth, T. Bach, *Nature* **2018**, *564*, 240.

[3] Short review: C. Brenninger, J. D. Jolliffe, T. Bach, *Angew. Chem. Int. Ed.* **2018**, *57*, 14338.