

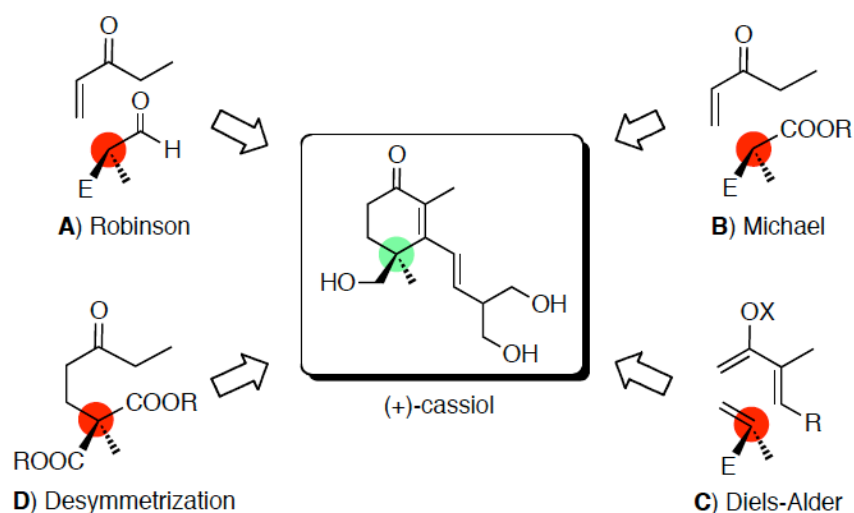
Synthetic Study of Biologically Interesting Natural Products Based on Organocatalytic Asymmetric Transformations.



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Recently, a great deal of attention has been focused on the development of new asymmetric catalyses using organic molecules to give chiral organic substances, so-called “asymmetric organocatalysis”. This storm of research interest blossomed just after the turn of this century, and several important contributions have been made. Organocatalytic asymmetric synthesis has several important advantages due to the ready availability, non-toxicity, ease of handling, insensitivity to moisture and oxygen, and environmentally friendly nature of the compounds involved. In our own efforts in this area, we have succeeded in developing important asymmetric transformations [1]. In this lecture our recent work on the efficient construction of a quaternary carbon stereogenic center will be presented (**Scheme 1**) [2]. This includes mainly (A) asymmetric Robinson-type annulation, (B) asymmetric Michael addition reaction, (C) asymmetric Diels-Alder reaction, and (D) desymmetrization of *meso*-compounds. Finally, the application of these methods to the synthesis of biologically interesting natural products will also be presented.



Scheme 1

- [1] Kotsuki, H.; Ikishima, H.; Okuyama, A. *Heterocycles* **2008**, *75*, 493-529 & 757-797; Kotsuki, H.; Sasakura, N. "Proline-related Secondary Amine Catalysts and Their Applications", *Comprehensive Enantioselective Organocatalysis*, Dalko, P., Ed.; Wiley-VCH, 2013, in press.
- [2] Kotsuki, H.; Sasakura, N. "Asymmetric Organocatalysis for the Construction of Quaternary Carbon Stereogenic Centers", *New and Future Developments in Catalysis - Catalysis for Remediation and Environmental Concerns*, Suib, S., Ed.; Elsevier, 2013, Chapter 19, pp 563-603.