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ROMP approaches for organic synthesis and efforts toward the synthesis of cyclipostins

AU

Poon, Wing Cheong [Ph.D.]; Hanson, Paul R. [advisor]

CS

The University of Kansas (0099)

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The work reported herein describes the applications of ring-opening metathesis polymerization (ROMP) using well-defined ruthenium-based catalysts for organic synthesis, and efforts toward the synthesis of cyclipostins.

A strategy to synthesize oligomeric sulfonamides employed both ring-closing metathesis (RCM) and ring-opening metathesis polymerization (ROMP). Amino acid-derived cyclic sulfonamides containing either exocyclic or β -endocyclic stereogenic centers were generated via RCM. These cyclic sulfonamides underwent stereoselective Diels-Alder reactions to yield endo-norbornenyl sulfonamides as major diastereomers. Subsequent ROMP rapidly produced sulfonamide-based oligomers, and these oligomers exhibited different solubility in a variety of solvents. Based on the solubility difference of these oligomers, a capture-*ROMP*-release strategy for the chromatography-free purification of Mitsunobu reaction products is described. Oxo-norbornenyl-tagged reagents are utilized for standard solution phase Mitsunobu chemistry. Post-reaction, phase-switching was accomplished via *in situ* ROMP followed by precipitation of the polymer with methanol. Release of the product from the polymer afforded amines and alkyl hydrazine derivatives with good yields and purities.

The C-H activation strategy mediated by Rh₂(OAc)₄ was utilized toward the synthesis of cyclipostins. This novel class of natural product possesses strong inhibitory action against hormone-sensitive lipase (HSL) and has potential in the development of therapeutic agents to regulate lipolysis for the treatment of noninsulin-dependent diabetes mellitus (NIDDM). The initial results of this project are reported.

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