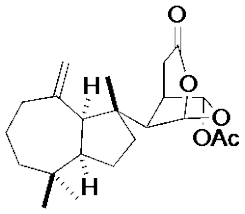
Fragment Coupling and Constructing Quaternary-Carbon Stereocenters Using Carbon Radicals

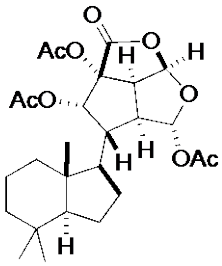
Larry E. Overman

Department of Chemistry, University of California, Irvine

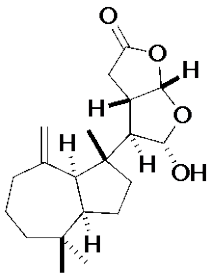
Our contemporary life style would not be possible without products–ranging from fuels, clothing, pharmaceutical and agricultural products to electronic devices– that are produced by organic chemistry. Convergent synthesis strategies in which an organic molecule is prepared by a branched approach wherein two or more fragments are combined at a late stage are almost always preferred over a linear approach in which the overall yield of the target molecule is eroded by the efficiency of each successive step in the sequence. As a result, reactions that achieve the high-yielding union of polyfunctional fragments have particular importance in the preparation of structurally intricate organic molecules. This lecture will discuss the under-appreciated utility of bimolecular reactions of free radicals to couple structurally intricate fragments with a particular emphasis on the total synthesis of heterocyclic diterpenoid natural products.



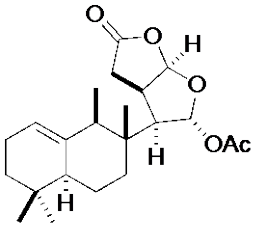
aplyviolene



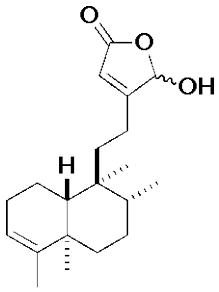
chromodorolide B



cheloviolene A



macfarlandin C



PL3