

TOWARDS THE TOTAL SYNTHESIS OF PROVIDENCIN

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Providencin is a highly oxygenated diterpenoid found in the sea plume *Antilloorgia Kallos* [1]. It features a previously undescribed bicyclo[12.2.0]undecane carbon skeleton containing a tetrasubstituted cyclobutane ring, two *trans*-fused epoxides and a butenolide moiety. The absolute configuration of providencin remains to be proven. Biological testing revealed modest cytotoxic activity against several human cancer cell lines.

This work presents the synthesis of important building block **1** *en route* to providencin, based on a new retrosynthetic approach. Starting from fumaryl chloride, key steps are an enantioselective Lewis acid-catalyzed cycloaddition reaction to form the cyclobutane ring in **2**, a copper-assisted Stille-coupling under very mild conditions and the regioselective deprotection of just one of two trityl protecting groups.

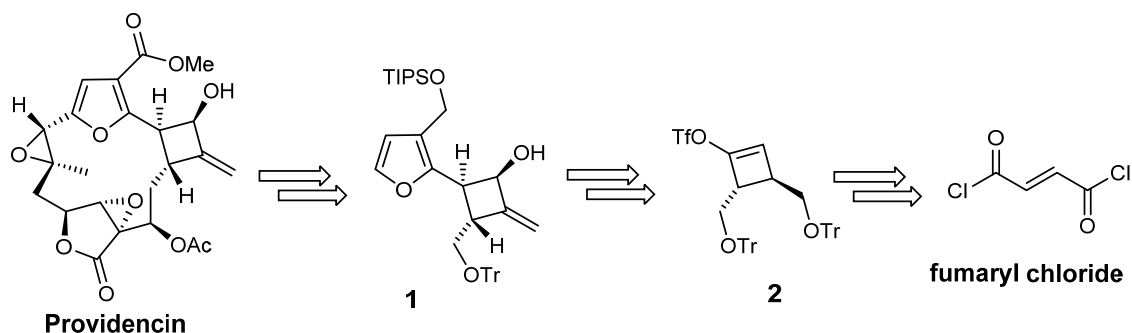


Figure 1: Retrosynthetic Analysis of Providencin

[1] Marrero, J.; Rodriguez, A. D.; Baran, P.; Raptis, R. G.; Sanchez, J. A.; Ortega-Barria, E.; Capson, T. L. *Org. Lett.* **2004**, *610*, 1661–1664.