

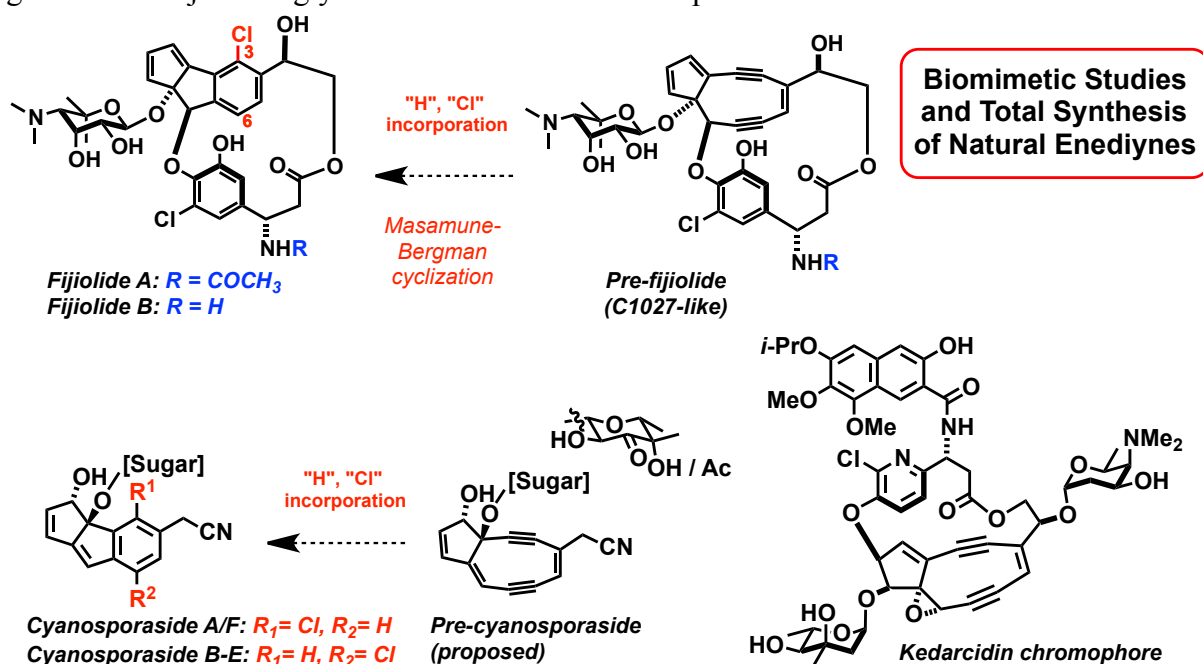
# Total Synthesis and Biomimetic Studies of Nine-Membered Eneidyne

Martin J. Lear\*, Keiichiro Hirai, Kei Yamada, Ryo Takahashi, Masahiro Hiramama\*

Department of Chemistry, Graduate School of Science, Tohoku University, Sendai 980-8578

Martin.Lear@m.tohoku.ac.jp

The kedarcidin and C1027 chromophores are formidable targets of total synthesis. During our 20-year study of these nine-membered enediynes, several powerful, yet chemoselective methods have been developed: stereoselective epoxyalkyne formation, atropselective Pd/Cu-Sonogashira coupling, 2-deoxy- $\alpha$ -glycosylation, CeX<sub>3</sub>-mediated enediynes cyclisation, and SmI<sub>2</sub>-based reductive olefination. Besides their total syntheses, application of these methods to the biomimetic study of the putative enediynes-precursors of the cyanosporasides, sporolides, and fijiolides will be presented. In particular, we disclose biomimetic evidence of a *p*-benzyne diradical species reacting in either a radical mode (hydrogen abstraction) or ionic mode (chloride attack) at the same sterically exposed site, leading to either monochlorinated cyanosporaside A/F or cyanosporaside B-E, respectively. The ionic monochlorination of the cycloaromatized *p*-benzyne of the C1027 enediynes core to generate the fijiolide aglycon framework will also be presented.



\*Dedicated to the lasting contributions of Professor Emeritus Masahiro Hiramama to Total Synthesis

CV of Attendant: Martin J. LEAR (マーティン・リアー).

**Education:** University of Glasgow, Scotland, UK (B.Sc., 1991; Ph.D., 1996).

**Professional career:** Since Jan 2013, he has been a Lecturer and then Associate Professor at Tohoku University (Sendai, Japan). During 2005 to 2012, he was as a Lecturer and core-member of the Medicinal Chemistry Group at the National University of Singapore (NUS). During 2000 to 2004, he was an Assistant Professor at Tohoku University with Masahiro Hiramama (Sendai, Japan).

**Awards / other information:** Postdoctoral fellowships include Parke-Davis (Cambridge, UK, 1996), ICSN-CNRS (Gif-sur-Yvette, France, 1997) and Tohoku University (JSPS and CREST, 1997-2000). Dr. Lear is also a Co-founder and Director of [www.BioLynxTech.com](http://www.BioLynxTech.com) (Singapore, since March 2011).

