

# Organic Seminar

**Professor Tim Jamison**

**Massachusetts Institute of Technology**

**Tuesday, November 3, 2009**

**11:00 a.m.**

**Room 1315 Chemistry**



## **Epoxide-Opening Cascades**

The proposed biogenesis of the brevetoxins features a dramatic series (cascade) of epoxide-opening reactions, elegantly accounts for the structural and stereochemical features of all related “ladder” polyethers, and in principle significantly simplifies the synthesis of these extraordinarily complex molecules. In practice, however, the cascade is strongly disfavored, and in general, non-natural directing groups must be covalently attached to each epoxide to overcome this inherent bias.

We will discuss a method for high-yield “directing-group-free” cascades that also supports the postulated biosynthesis. The two salient aspects of this strategy are a single design principle (a template) and a promoter that both donates and accepts hydrogen bonds. Water (H<sub>2</sub>O) itself is the superior promoter, and it is most effective near pH 7. Our recent work in this area will be presented.