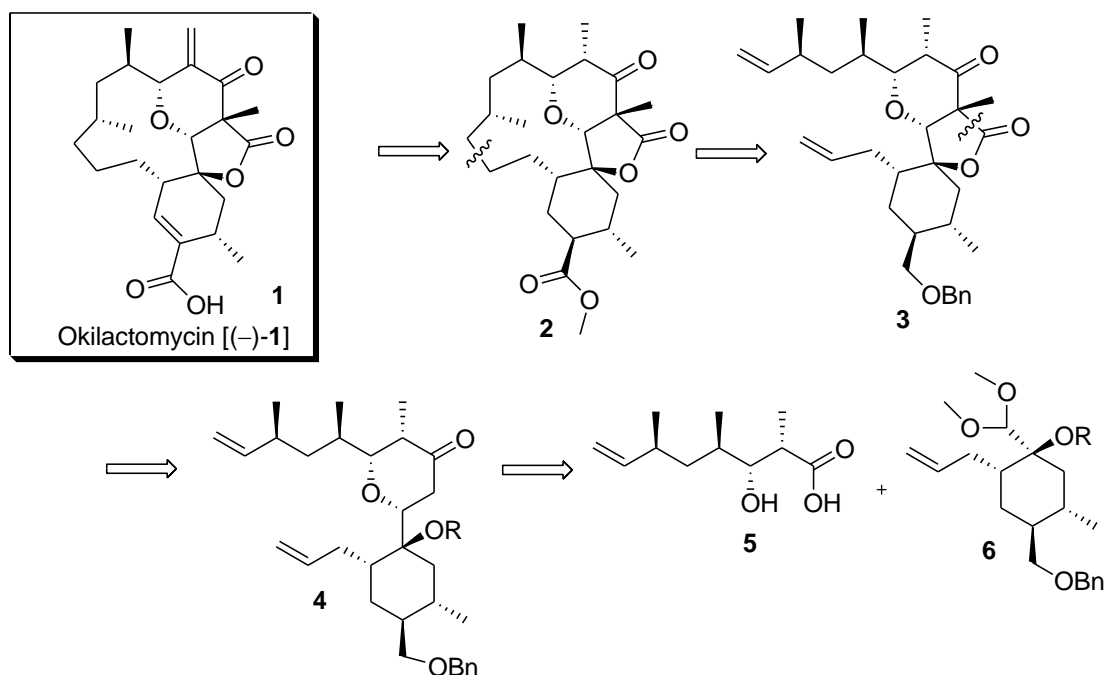


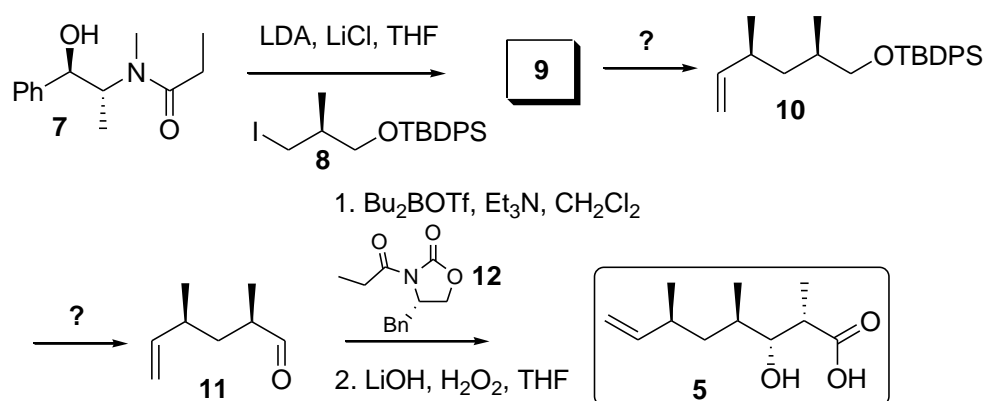
Total synthesis of (–)-Okilactomycin

(+)-Okilactomycin (+)-**1** was isolated in 1987 by Imai and co-workers from a bioactive filtrate of *Streptomyces griseoflavus*. Albeit the total synthesis of the natural poliketide was not yet achieved, we are going to disclose the total synthesis of its antipode (–)-**1**.

Retrosynthetic perspective



Synthesis of the fragment 5

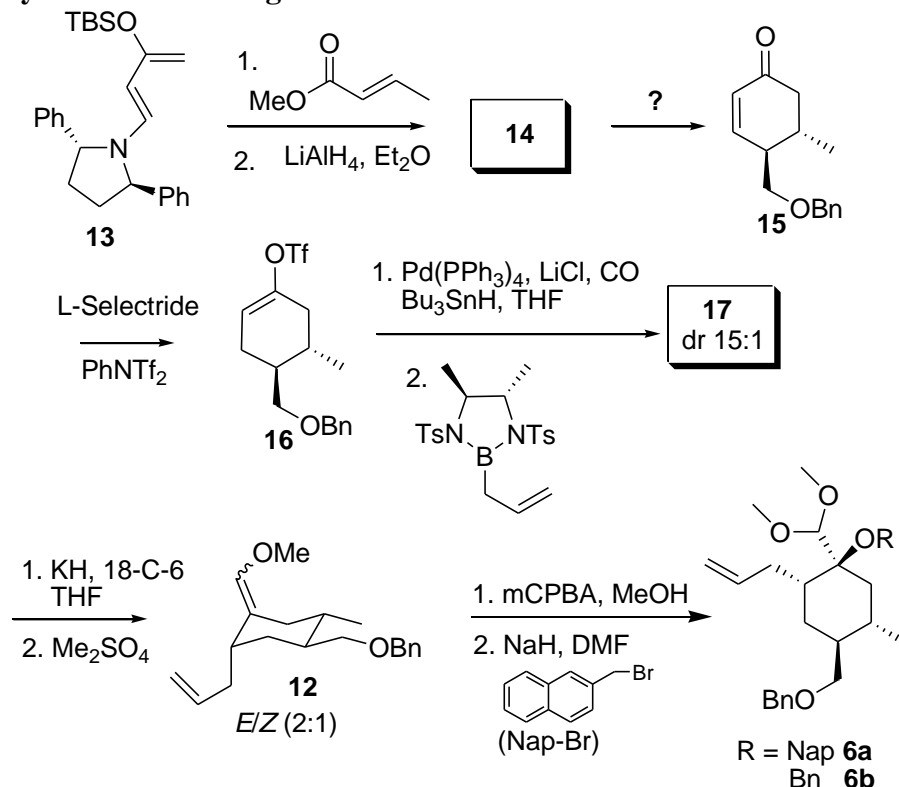


Scheme 1.

- 1) How could you prepare starting materials **7** and **8**? Do you know the name of **7**?
- 2) What is the structure of intermediate **9**? It has been obtained as a single diastereoisomer, try to explain the stereoselectivity.

- 3) Authors achieved the intermediate **10** in three steps. Give the reagents.
- 4) Other two simple transformations afforded compound **11**. Give the reagents.
- 5) A diastereoselective aldol reaction with the well known oxazolidinone **12** (name?) afforded fragment **5**. Explain the obtained stereochemistry.

Synthesis of the fragment 6



Scheme 2.

- 6) Diene **13** was published by Rawal and co-workers in 1997. Any idea about the synthesis?
- 7) It reacts with methyl crotonate in a complete stereoselective Rawal-Diels Alder reaction. What is the structure of adduct **14**?
- 8) How **14** could be transformed into the enone **15**? Authors made that in two steps and 90 % overall yield.
- 9) Could you provide the mechanism for the 1,4-reduction of the enone mediated by L-Selectride?
- 10) What is the structure of compound **17**?
- 11) What kind of reaction lead to compound **12**?
- 12) Could you provide a reasonable mechanism for the transformation of **12** into the fragment **6a**? Do you know the name of this reaction?
- 13) The author claimed that compound **6a** is completely orthogonal protected. Could you provide some methods to deprotect each functional group without touching the others?

...To be continued