Total Synthesis of Ganoapplanin Enabled by a Radical Addition/Aldol Reaction Cascade

Nicolas Müller, Ondřej Kováč, Alexander Rode, Daniel Atzl, and Thomas Magauer*
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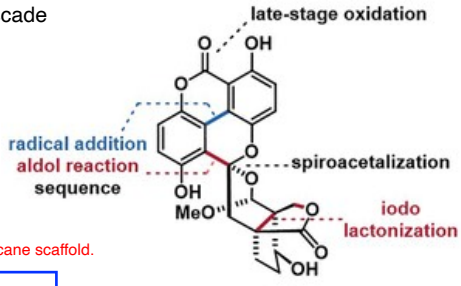
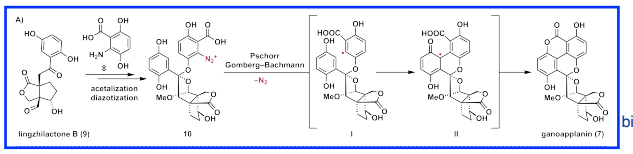
intramolecular 6-exo-trig radical addition of a quinone monoacetal followed by an intermolecular aldol reaction.

isolated by Qiu in racemic form from the fungus Ganoderma applanatum in 2016

6/6/6/6 tetracyclic system, including a tetra-ortho substituted biaryl motif and a dioxatricyclo[4.3.3.0]dodecane scaffold.

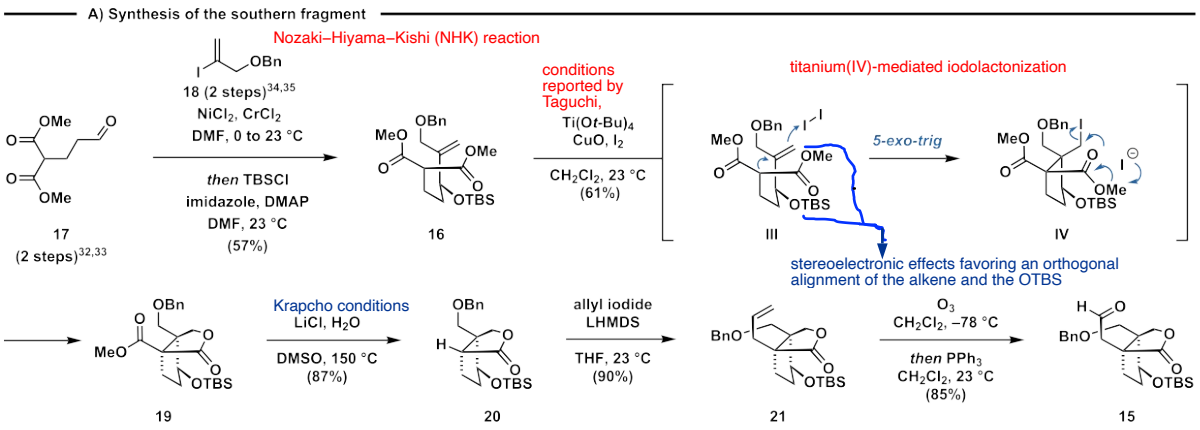


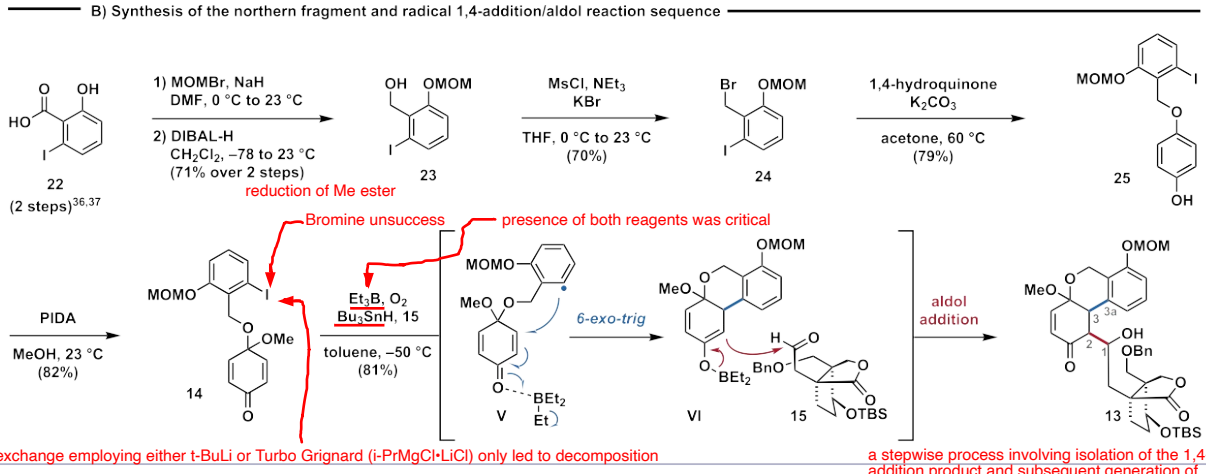
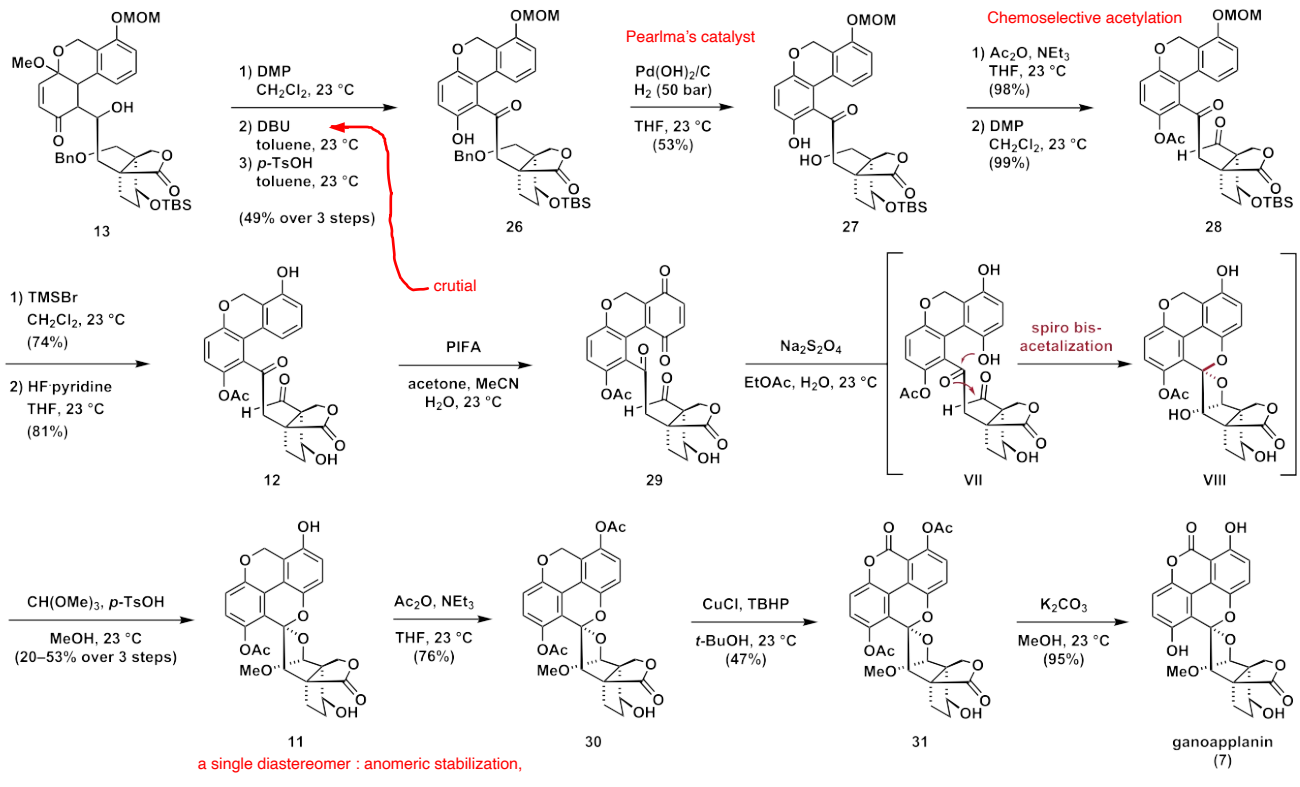
- isolated from *Ganoderma applanatum*
- 6/6/6/6 tetracyclic system
- dioxatricyclo[4.3.3.0]dodecane
- spiro bisacetal



biosynthesis

Scheme 2. (A) Synthesis of Aldehyde 14 and a (B) Radical 1,4-Addition/Aldol Sequence





Scheme 3. Late-Stage Oxidations and Completion of the Synthesis of Ganoapplanin