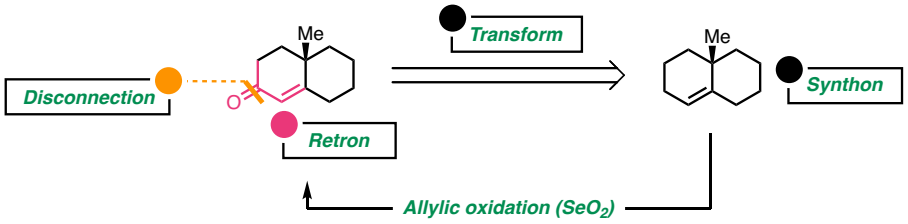
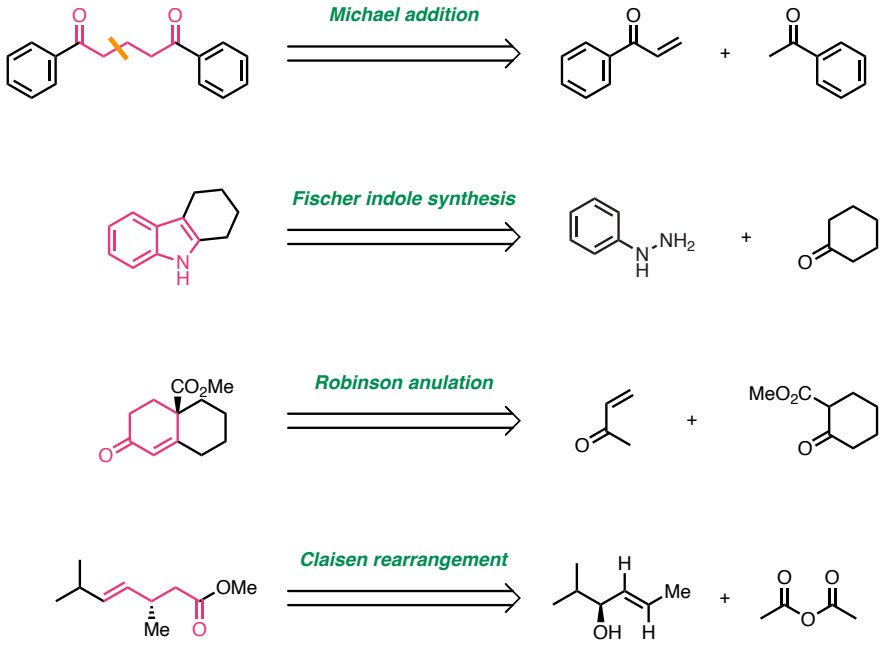
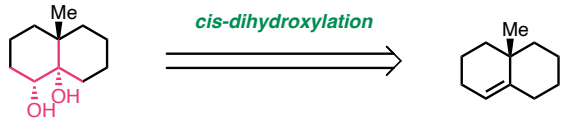
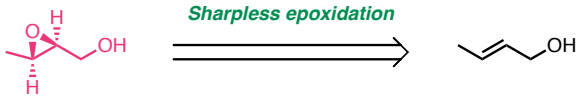
1. Name the different parts/components that constitute the following retrosynthetic analysis, and the reaction employed (arrows at the bottom part) to synthesize this synthetic target (TGT). [★]

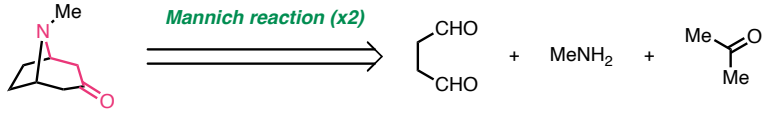


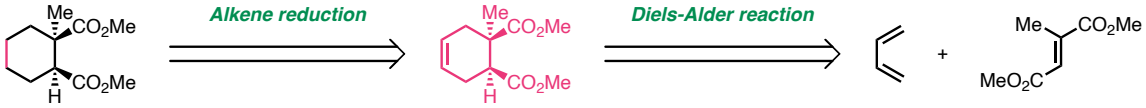
2. For the proposed synthetic targets (TGTs), identify the retrons and propose the corresponding disconnection steps, synthons, and synthetic equivalents to create these TGTs. Note that multiple solutions are possible, and the ones provided in the solution set are just a possibility. [★★]



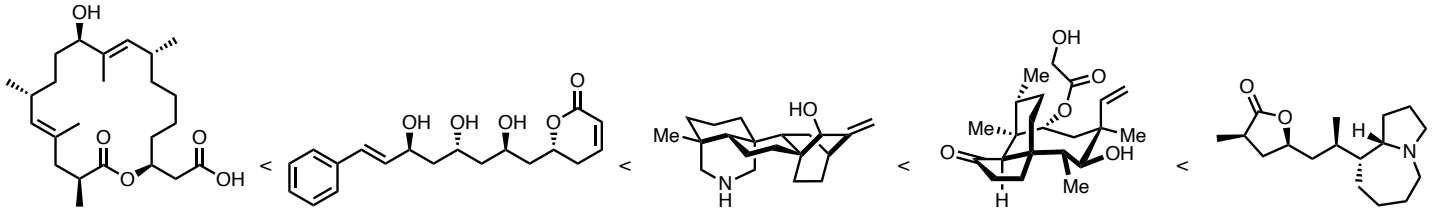








3. Try to rank the next molecules based on their complexity. Then, use the Böttcher Score calculator (https://forlilab.org/services/bottcher/) to calculate the complexity index (C_m) and the relation C_m/atom. [★★]



Strasseriolide B
C_m: 323.25
Complexity/atom: 11.15

Cryptoconcatone D
C_m: 311.70
Complexity/atom: 12.99

Azitine
C_m: 315.79
Complexity/atom: 14.35

(+)-pleuromutilin
C_m: 393.76
Complexity/atom: 14.58

(-)-stemaphylline
C_m: 312.96
Complexity/atom: 15.65

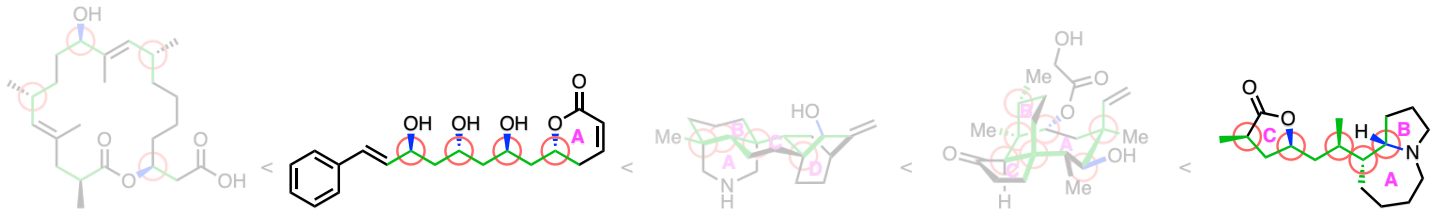
4. Choose 3 of the previous molecules and build Ex-Target Trees in order to find the most efficient retrosynthetic route following the guidelines proposed in the episode (strategic bond finding & Corey's guidelines). [★★★]

Strategic bond finding

- **1) Identify stereocenters**
- **2) Identify C-C bonds and C-X bonds**
- **3) Identify small/medium ring systems**

Corey's strategies

1. **Transform-based** - *what retrons/partial retrons can facilitate strategic bond formation*
2. **Stereochemical** - *how can we form stereocenters with stereocontrol*
3. **Structure-goal** - *are there chiral pool or other easily made/commercially available substructures present?*
4. **Functional-group** - *how can we us FGs to make strategic bonds?*
5. **Topological** - *which rings make the most sense to make? Which to preserve?*



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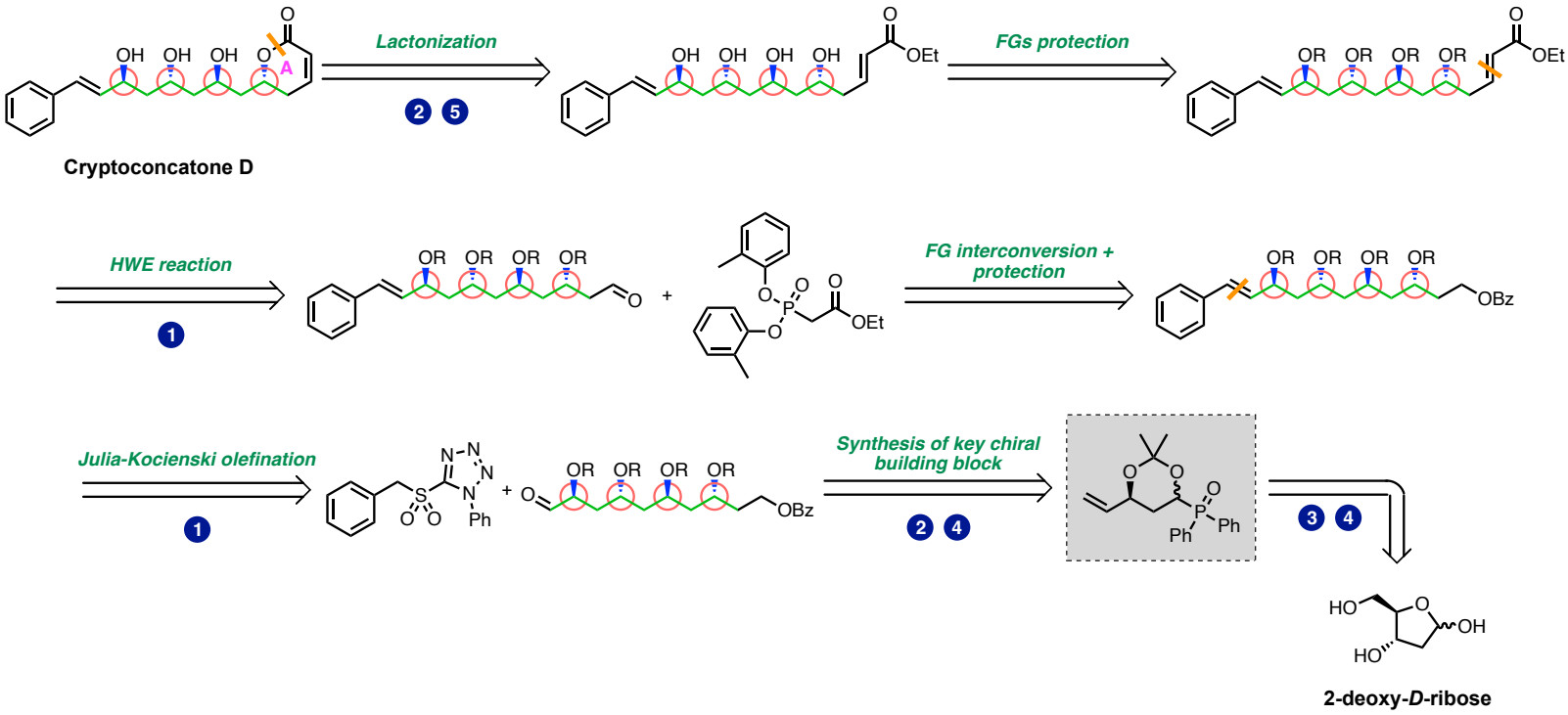
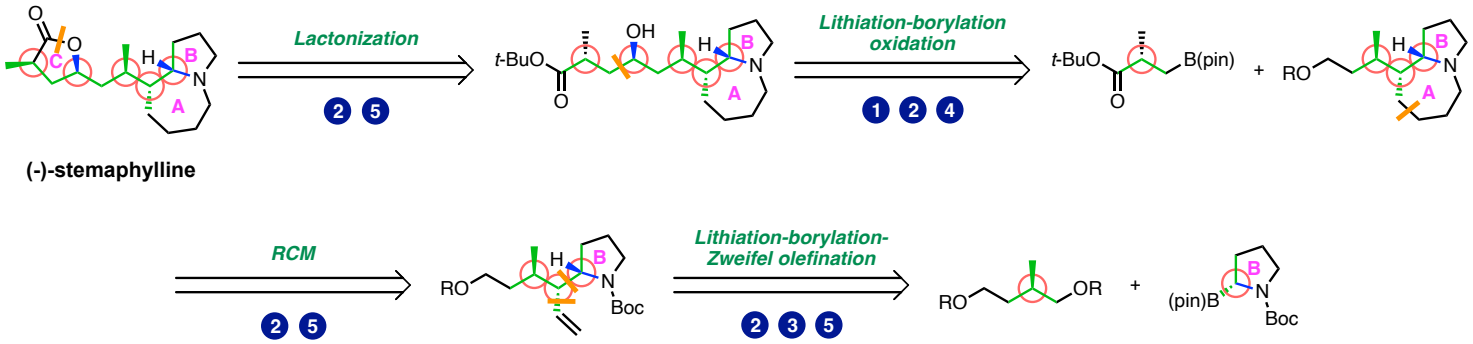
Kirsch *et al.* (*J. Org. Chem.* **2022**, *87*, 14899−14908)



Cryptoconcatone D

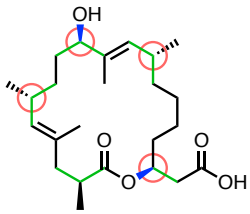
2-deoxy-*D*-ribose

Aggarwal *et al.* (*Angew. Chem. Int. Ed.* **2017**, *56*, 2127 –2131)



(-)-stemaphylline

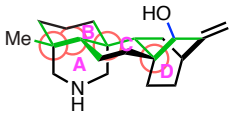
To see the retrosynthetic analysis and Total Syntheses of the other three natural products, refer to:



Strasseriolide B

Rychnovsky *et al.* (*Org. Lett.* **2022**, *24*, 1190−1194)

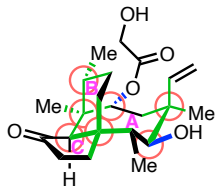
Synthesis Workshop - Episode 90



Azitine

Ma *et al.* (*Angew. Chem. Int. Ed.* **2018**, *57*, 6676−6680)

Synthesis Workshop - Episode 89



(+)-pleuromutilin

Reisman *et al.* (*J. Am. Chem. Soc.*. **2018**, *140*, 1267−1270)

Synthesis Workshop - Episode 30