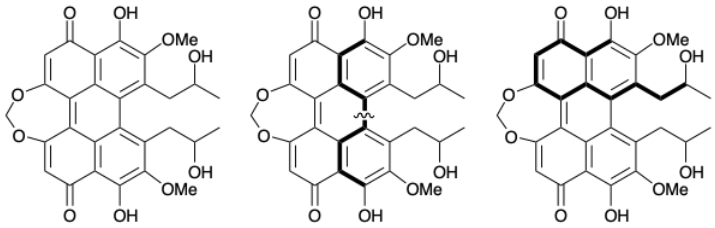
5.6: Study Questions

1. **Biosynthetic Strategies**

(a) Draw a circle around each of the "common atoms" (as defined by Corey) in the carbon skeleton in the following structure of cercosporin (**160**).



cercosporin (160) **161** **162**

(b) What is the polar reactivity relationship between the two functional groups at the ends of the circuits that are highlighted in **161** with respect to the bond indicated with a wavy line?

(c) What are the polar reactivity relationships between all of the functional groups with respect to all bonds along the circuit that is highlighted in **162**?

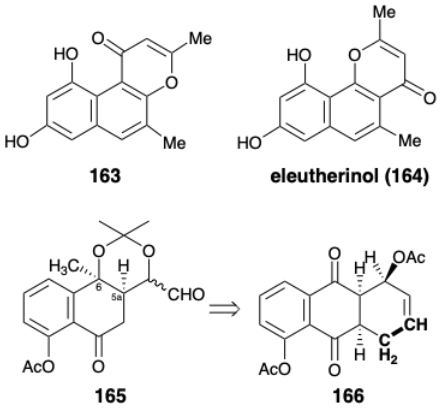
(d) Presuming that this symmetrical molecule is generated in Nature by dimerization of a precursor, write a structure for that precursor of cercosporin (**160**).

(e) Name one type of reaction that could generate the bonds which unite two molecules of the biosynthetic precursor of cercosporin (**160**) that you proposed in d above.

(f) On the basis of a biogenetic hypothesis, the correct structure of eleutherinol was postulated to be **164** and not **163**. In the space provided, write the structure of an acyclic precursor of **164** that is suggested by the biogenetic hypothesis.

2. **Tactics in Polyketide Synthesis**

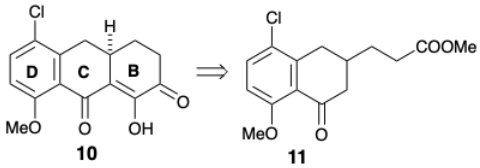
(a) In his total synthesis of terramycin, Muxfeldt utilized **166** as a precursor for **165**. Two of the carbons in **166**, the ones that are highlighted, are not needed in the skeleton of **166**. Explain **all** of the benefits of incorporating these two carbons in **166**.



163 **eleutherinol (164)**

165 **166**

(b) In his total synthesis of 6-desmethyl-6-desoxytetracycline, Woodward exploits chloroester **168** as a precursor for **167**. Neither the cholro nor the carbomethoxyl groups in **168** are incorporated into the final product, 6-desmethyl-6-desoxytetracycline. Explain the strategic roles of these two groups in the synthesis.



10 **11**