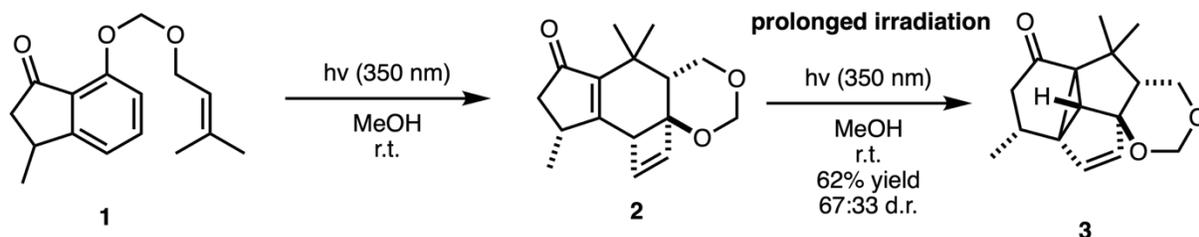


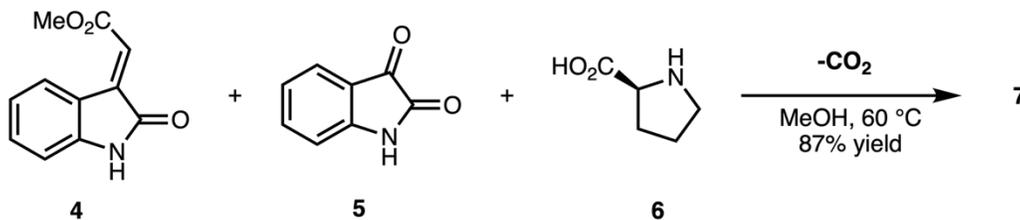
## Problem Session 12/02/2026 – Shawn

**Exercise 1:** The Bach group employed a photochemical cascade reaction to furnish the strained polycyclic compound **3**, which is a key intermediate for the total synthesis of Agarozizanol B, a member of the prezizane family of natural product. Propose a possible mechanism for the formation of **2** from **1**.



**Bach:** *Angew. Chem. Int. Ed.* **2021**, *60*, 24039-24042.

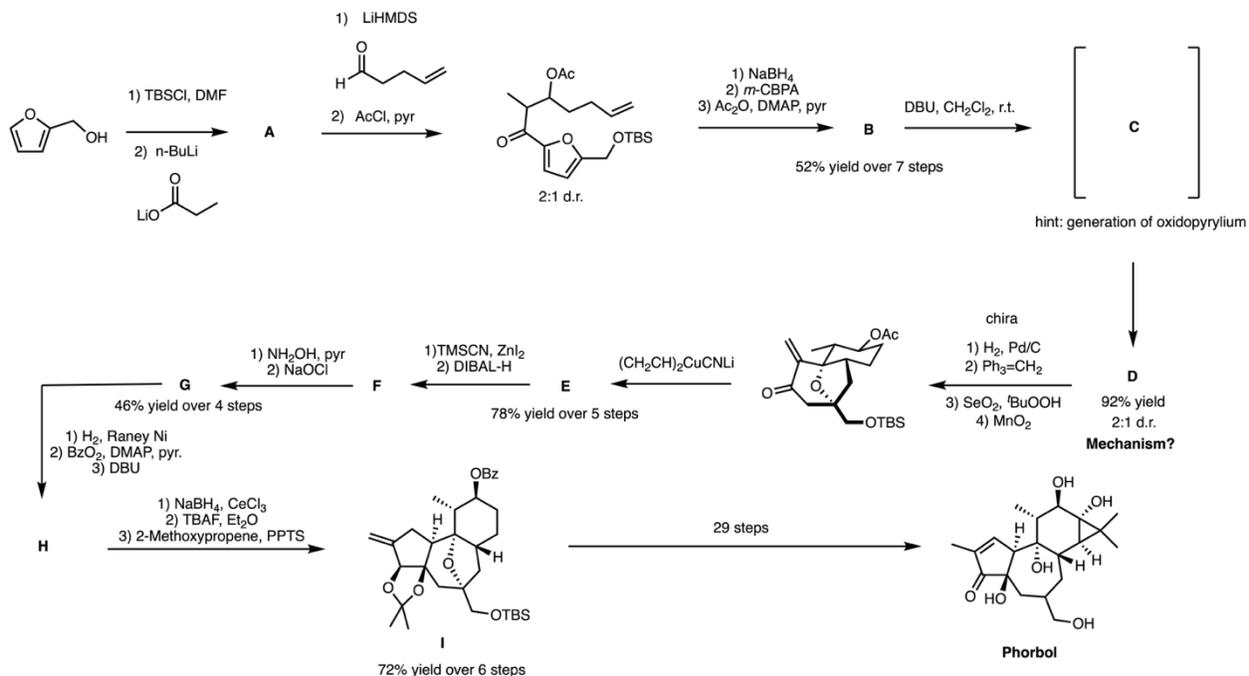
**Exercise 2:** The Kürti group reported a concise total synthesis of isatindigotindoline C, a 3,3'-spiropyrrolidone oxindole alkaloid through a multi-component reaction. Propose a possible mechanism for the multicomponent reaction of **4**, **5** and **6** to give compound **7**. Indicate the structure of **7**.



Hint:  $\text{CO}_2$  is lost in the process to give rise to a key reactive intermediate.

**Kürti:** *Org. Biomol. Chem.* **2020**, *18*, 2051-2053.

**Exercise 3:** Wender and co-worker reported the total synthesis of phorbol. In their synthetic studies they identified a key polycyclic structure **I**, that can be elaborated to phorbol. The Wender group has employed a similar strategy to also excess Resiniferatoxin. Provide the missing intermediates and the mechanism when asked.



**Wender:** Polycyclycle G synthesis: *J. Am. Chem. Soc.* **1989**, *111*, 8954-8957.

**Wender:** Total synthesis of phorbol: *J. Am. Chem. Soc.* **1989**, *111*, 8957-8958.

**Wender:** Improved total synthesis of phorbol: *J. Am. Chem. Soc.* **1990**, *112*, 4956-4958.

**Wender:** Total synthesis of Resiniferatoxin: *J. Am. Chem. Soc.* **1997**, *119*, 12976-12977.