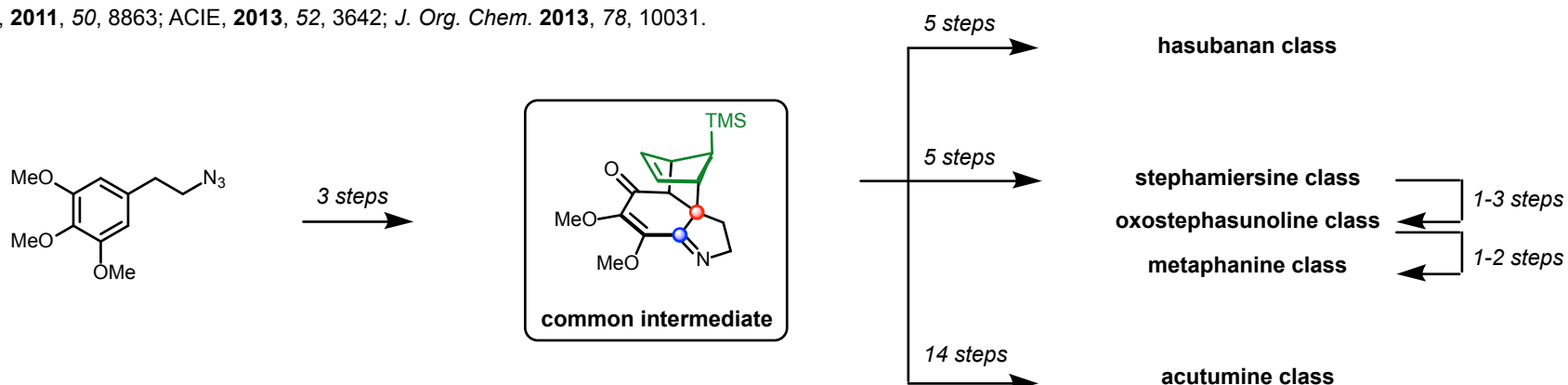


### ■ Facts

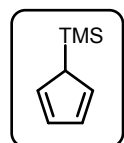
- botanical alkaloids that share a common tetracyclic propellane skeleton.
- Hasubanan alkaloids contain an aromatic ring, whereas the acutumine alkaloids possess a spirocyclic cyclopentenone moiety.
- Exhibit diverse biological effects such as antimicrobial, antiviral (HIV and hepatitis B), opioid receptor binding activities, memory-enhancing properties, etc.

### ■ Synthetic strategy taken by Herzon group

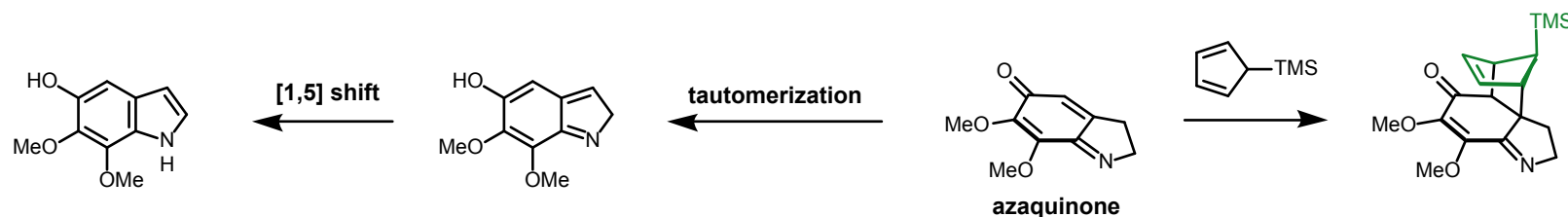
ACIE, **2011**, 50, 8863; ACIE, **2013**, 52, 3642; *J. Org. Chem.* **2013**, 78, 10031.



### ■ (Trimethylsilyl)bicyclo[2.2.1]hept-2-ene



– Used as a temporary protecting group of bicyclic azaquinone (via Diels-Alder reaction) to prevent plausible tautomerization and 1,5-hydrogen atom shift.



- Introduction of TMS group, compared to plain cyclopentadiene, enhances the rate for the retro-Diels-Alder reaction (i.e. lower temperature). This is thought to attribute to the donation of electron density from the C-Si bonding orbital to the antibonding orbital of C-C sigma bonds that are breaking in the reaction.

ACIE, **2011**, 50, 8863; J. Org. Chem. **2013**, 78, 10031.