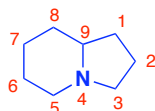
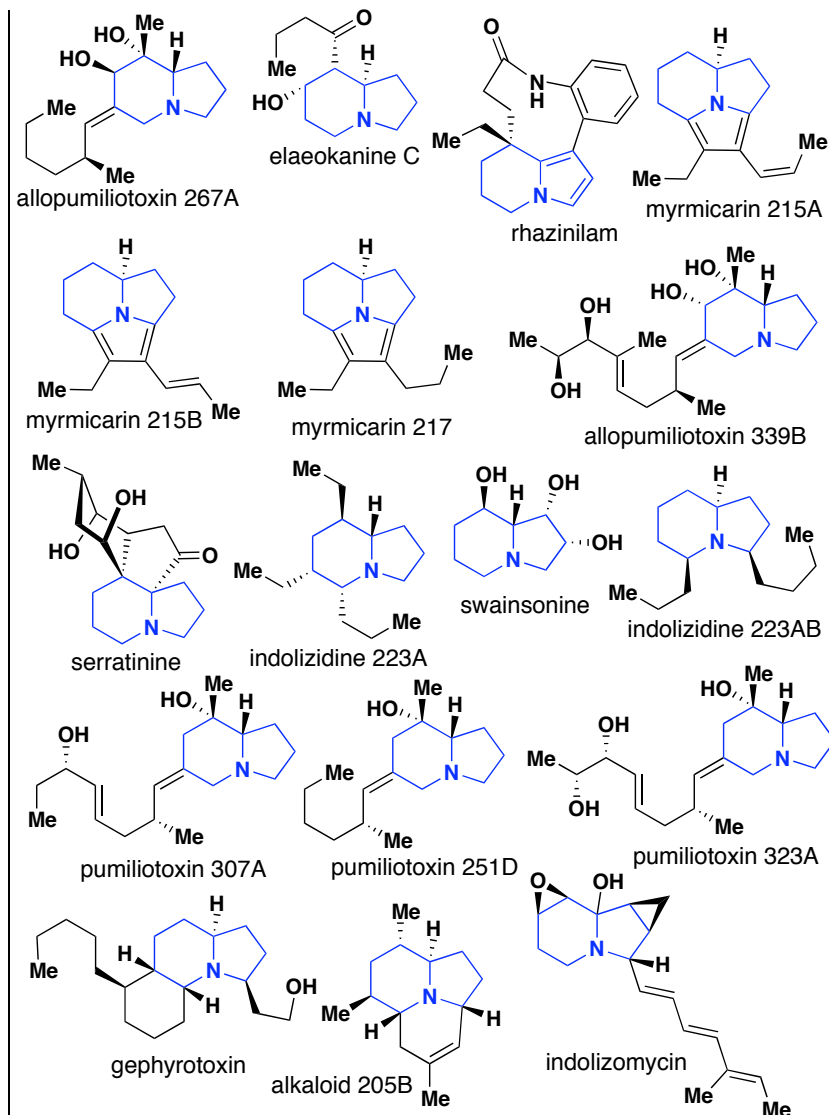
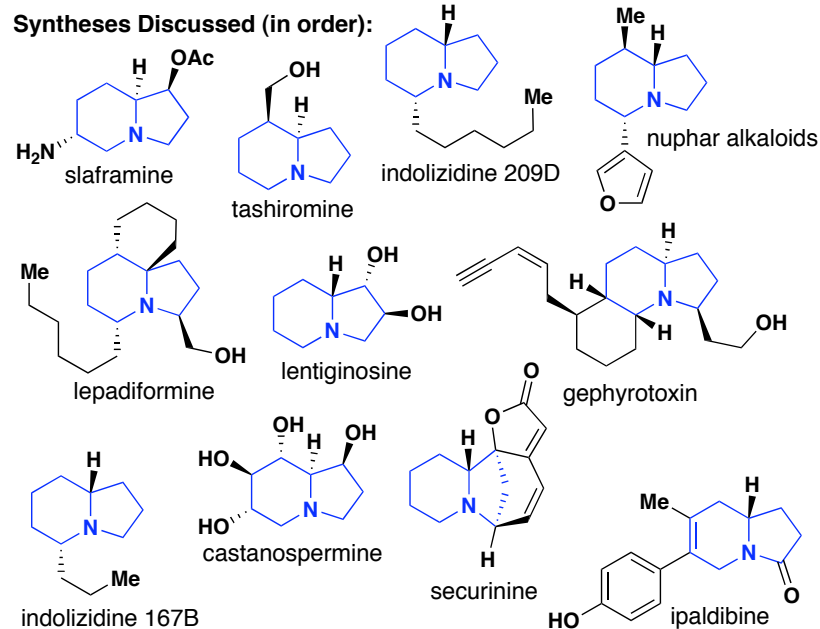
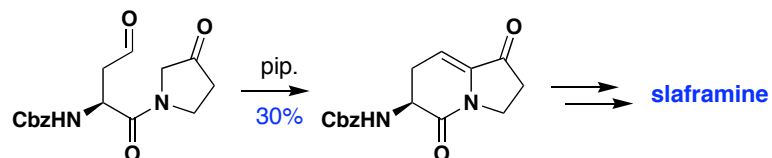
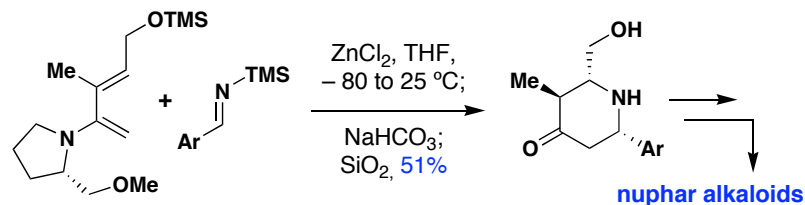
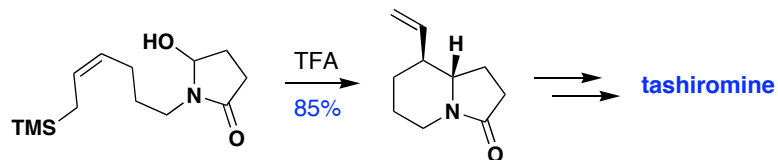
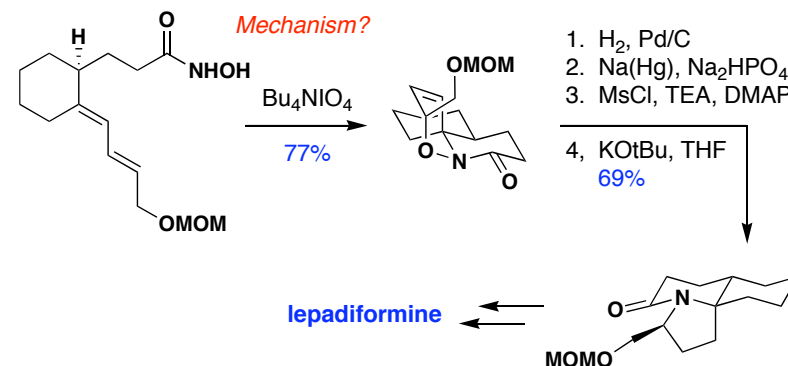
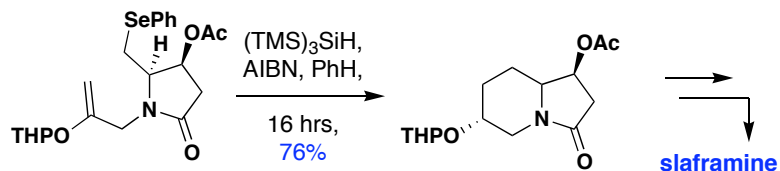
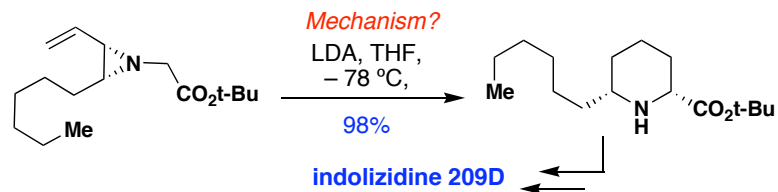
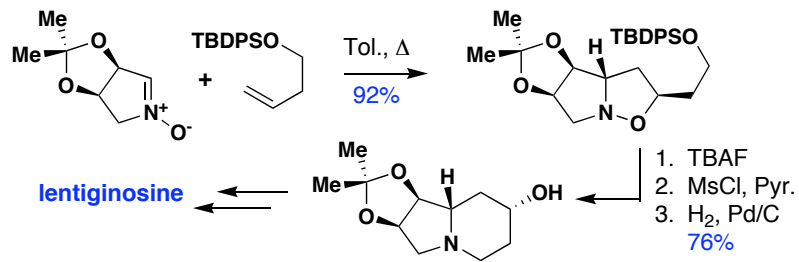
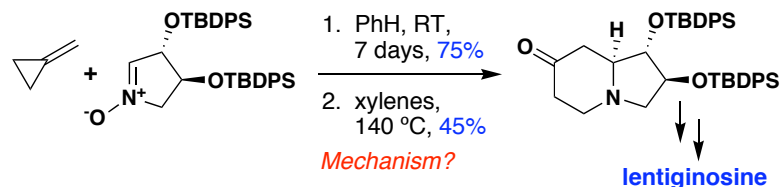
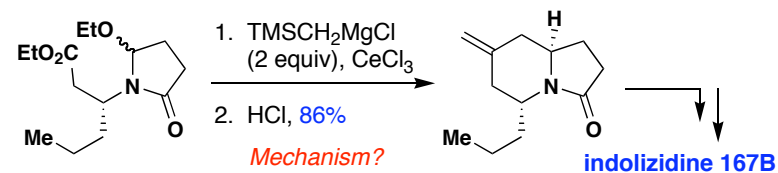
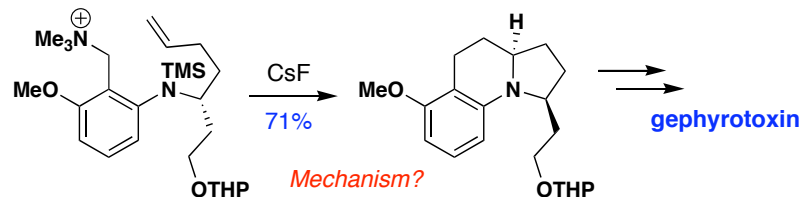
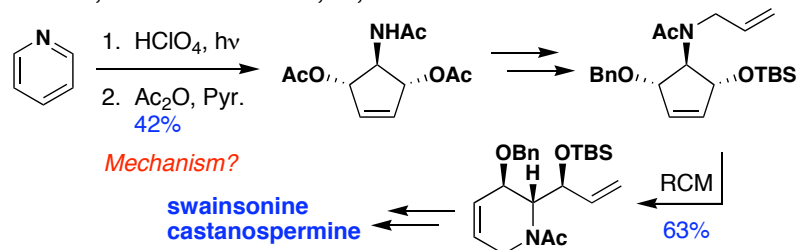


**Background/Introduction:**

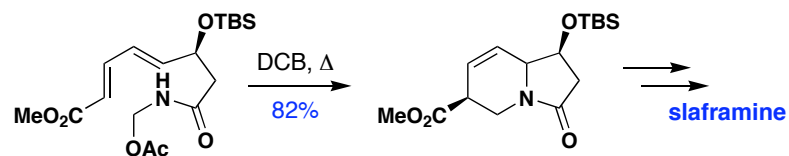
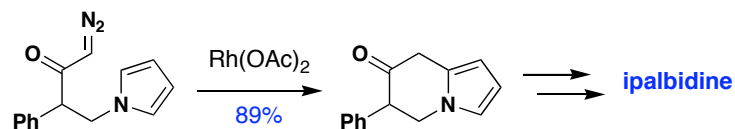
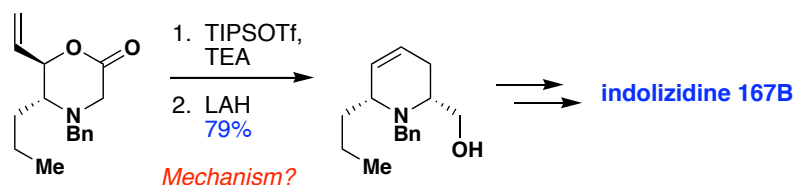
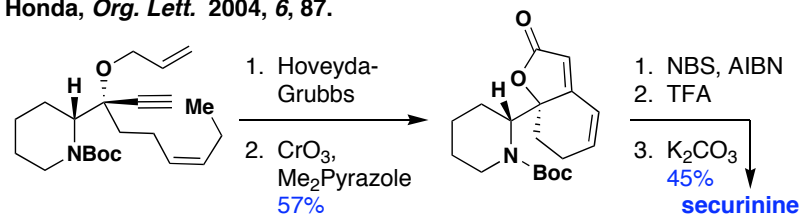
1. Isolated from a myriad of sources, including, but not limited to ants, frogs, fungi, and trees.
2. A host of effects including, but not limited to, harvest failures, edemas, necrosis, and rashes.
3. A host of activities including, but not limited to, phytotoxic, insecticidal, antibacterial, and fungicidal.
4. It is unclear what defines the limits of the family, however scores of natural products contain the core structure shown below. A sampling is provided at the end of the handout.
5. The ring is numbered as shows below.

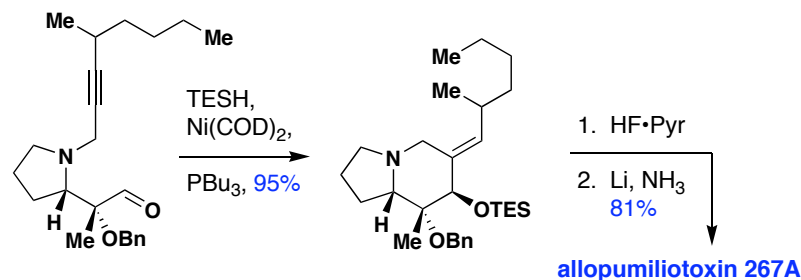
**Syntheses Discussed (in order):**

Gallagher, *Tetrahedron Lett.* 1995, 36, 6957.Barluenga, *J. Org. Chem.* 1999, 64, 3736.Marsden, *Synlett*, 2005, (16), 2528.Kibayashi, *J. Am. Chem. Soc.* 2000, 122, 4583.Knapp, *J. Org. Chem.* 1992, 57, 4802.Somfai, *Tetrahedron.* 1995, 51, 9747.Wightman, *Tetrahedron*, 1998, 54, 9429.

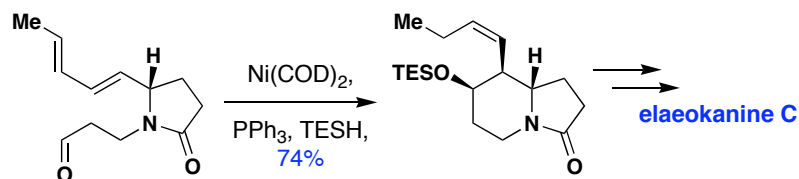
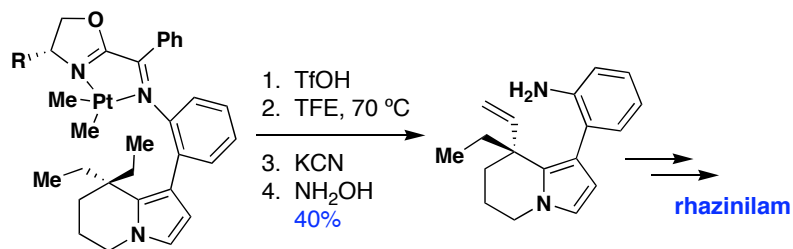
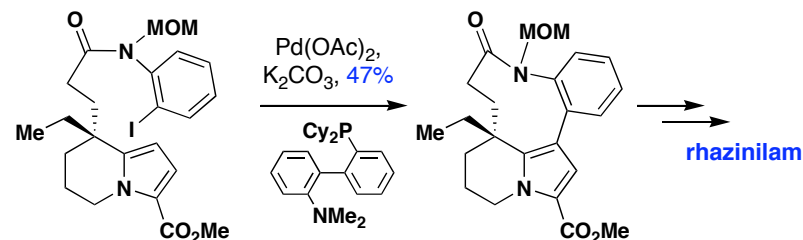
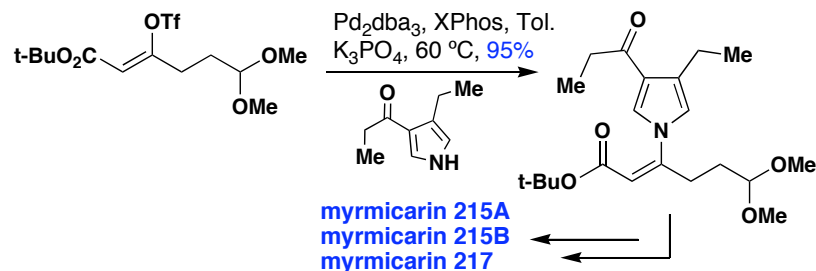
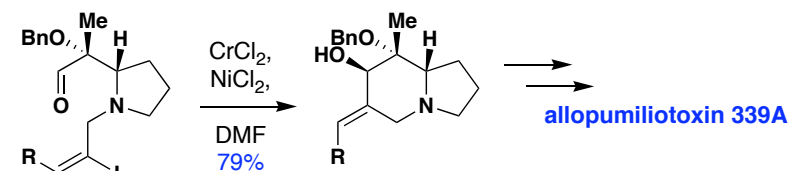
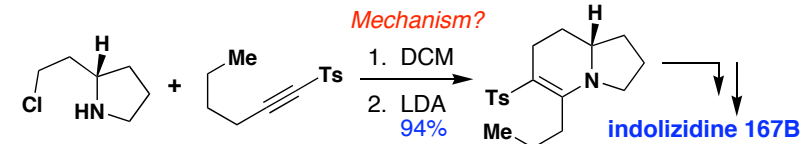
Goti, *Tetrahedron Lett.* 1994, 35, 949.Rumeson, *Tetrahedron Lett.* 1999, 40, 1661.Saegusa, *Tetrahedron Lett.* 1983, 24, 2881.Mariano, *Tetrahedron.* 2005, 61, 8888.

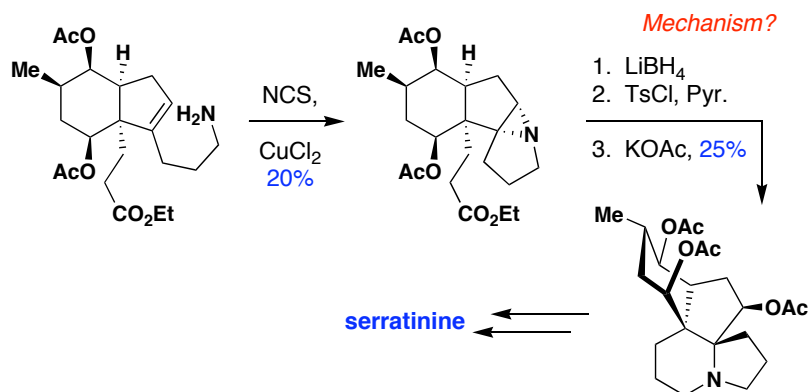
See "Pyridinium Photochemistry" Baran Group Meeting.

Weinreb, *J. Am. Chem. Soc.* 1982, 104, 7065.Jefford, *Helv. Chim. Act.* 1986, 69, 2048.Angle, *J. Org. Chem.* 1997, 62, 8549. *Tetrahedron Lett.* 1993, 34, 3985.Honda, *Org. Lett.* 2004, 6, 87.

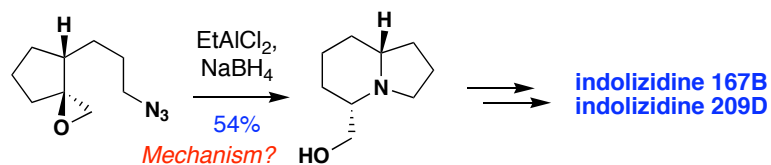
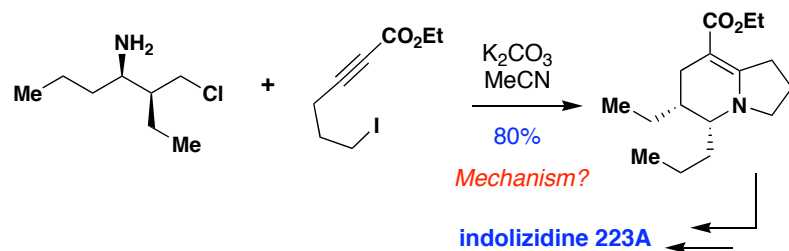
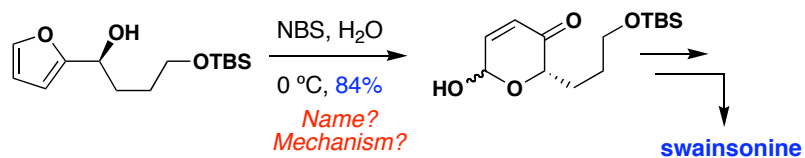
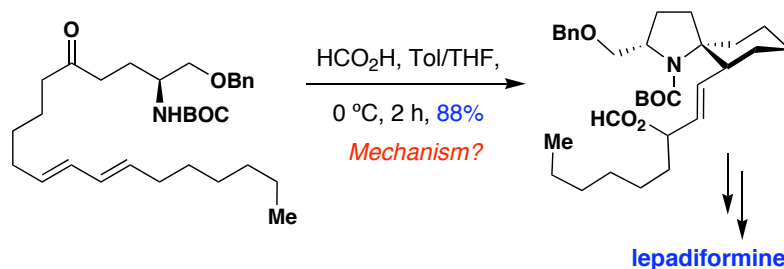
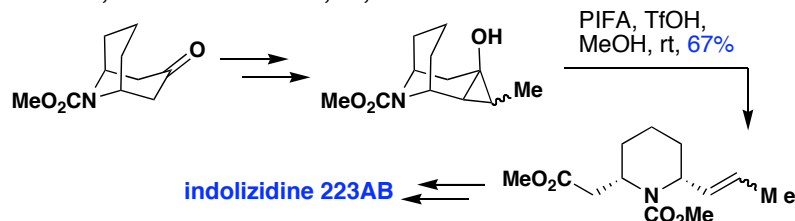
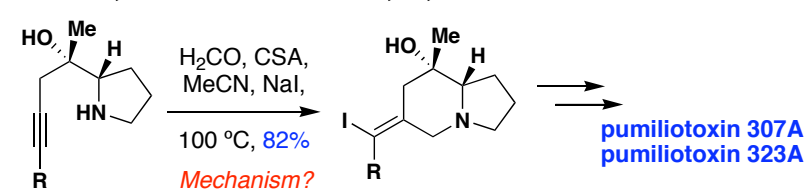
Montgomery, *J. Am. Chem. Soc.* 1999, 121, 6098.

See "Nickel in Synthesis" Baran Group Meeting.

Mori, *Tetrahedron*. 1998, 54, 1153. *Tetrahedron Lett.* 1997, 38, 3931.Sames, *J. Am. Chem. Soc.* 2002, 124, 6900. *ibid.* 2000, 122, 6321.Trauner, *Org. Lett.* 2005, 7, 5207.Movassaghi, *Org. Lett.* 2005, 7, 4423.Kibayashi, *J. Am. Chem. Soc.* 1992, 114, 10653.Back, *Org. Lett.* 1999, 1, 261. *J. Org. Chem.* 2000, 65, 4543.

Inubushi, *J. Chem. Soc. Chem. Commun.* 1974, 827.

See "Nitrogen Centered Radicals" Baran Group Meeting.

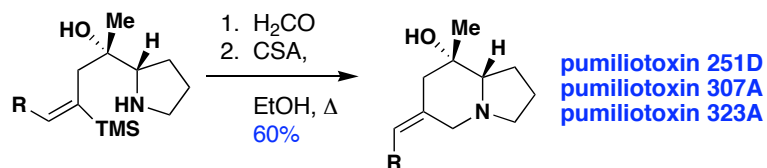
Baskaran, *Org. Lett.* 2003, 5, 583. *J. Org. Chem.* 2004, 69, 3093.Ma, *Org. Lett.* 2005, 7, 705.O'Doherty, *Org. Lett.* 2006, 8, 1609.Kibayashi, *Angew. Chem. Int. Ed.* 2002, 41, 3017.Kirihara, *Tetrahedron.* 1999, 55, 2911.Overman, *Tetrahedron Lett.* 1988, 29, 901.

Richter

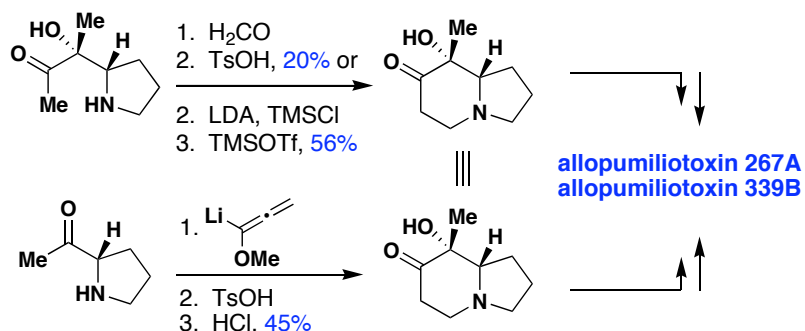
# Indolizidine Alkaloids

5/10/06  
Baran Group Meeting

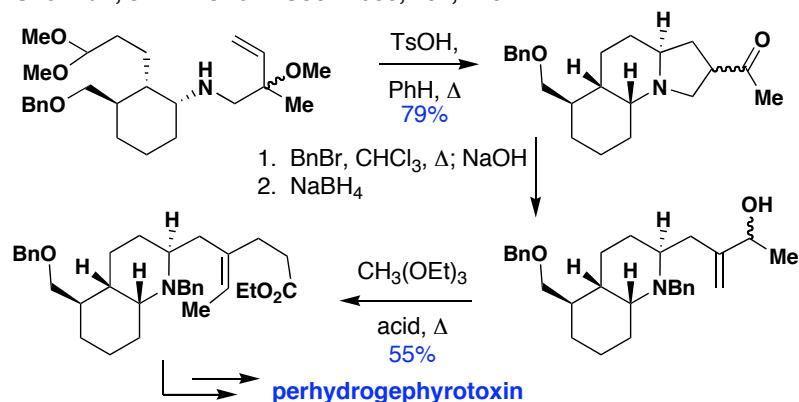
Overman, *J. Am. Chem. Soc.* 1984, *106*, 4192. *ibid.* 1981, *103*, 1851.



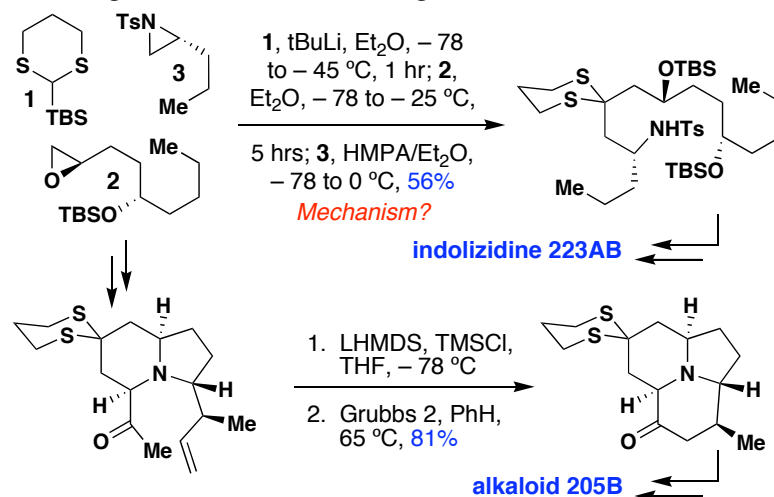
Overman, *J. Org. Chem.* 1992, *57*, 1179.



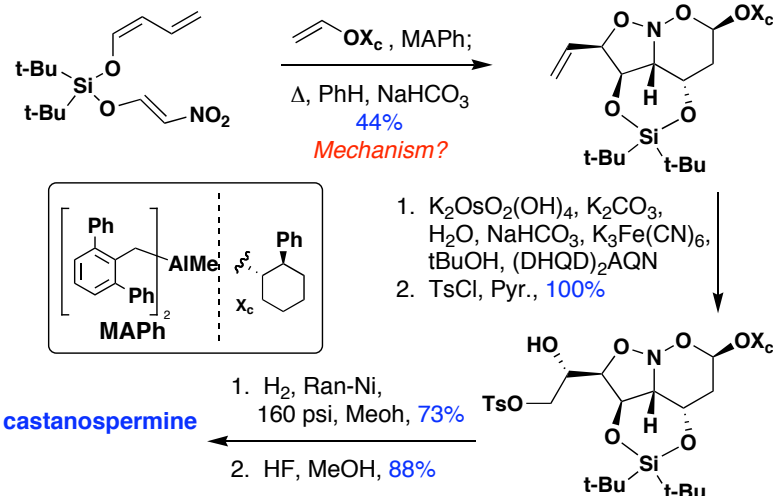
Overman, *J. Am. Chem. Soc.* 1980, *102*, 1454. *Mechanism?*

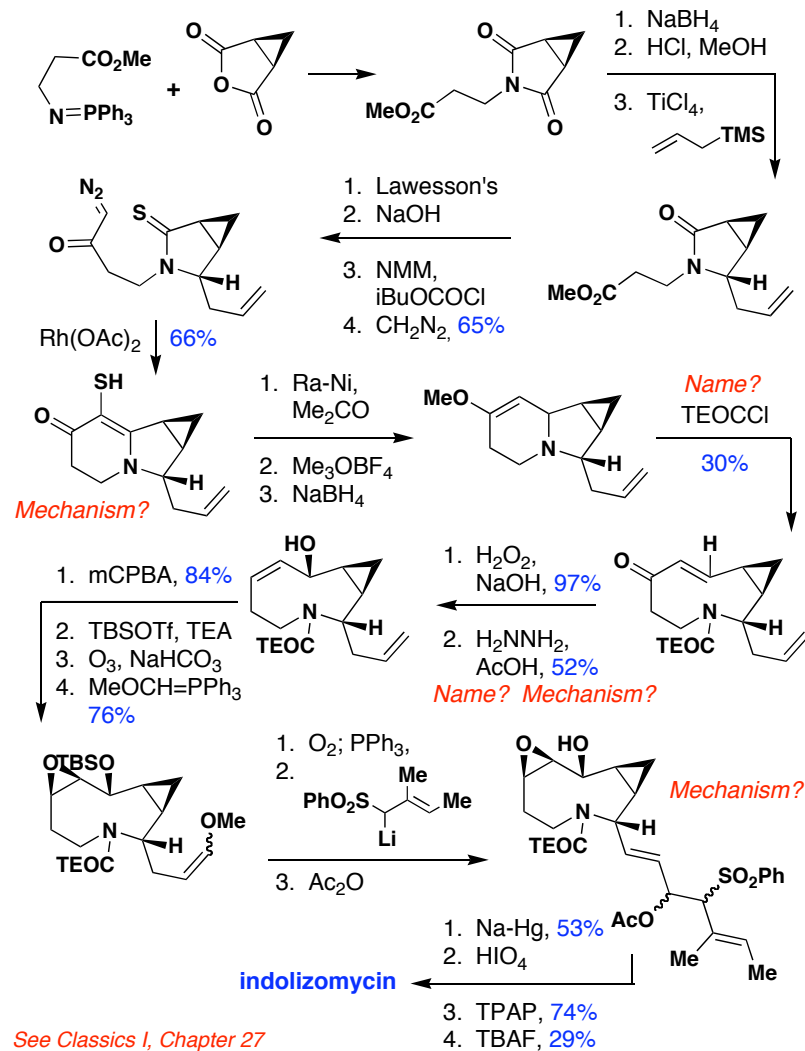


Smith, *Org. Lett.* 2005, *7*, 3247. *J. Org. Chem.* 2006, *71*, 2547.

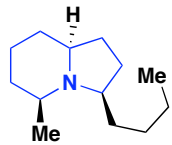


Denmark, *J. Am. Chem. Soc.* 1999, *121*, 3046.

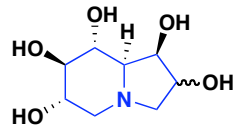


Danishefsky, *J. Am. Chem. Soc.* 1990, 112, 2003. *ibid.* 1993, 115, 30.

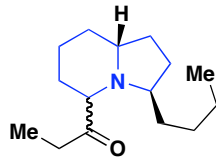
## Other Indolizidine Containing Natural Products:



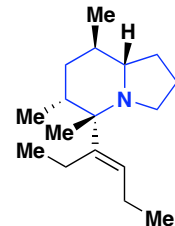
monomorine



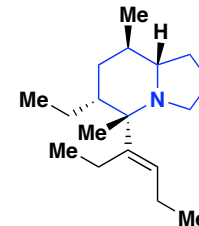
uniflorine A



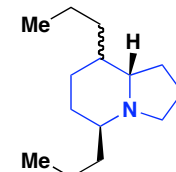
myrmicarins 237A/B



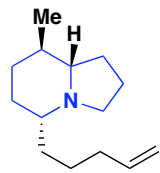
indolizidine 249H



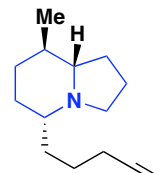
indolizidine 263D



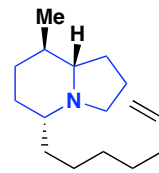
indolizidine 223I



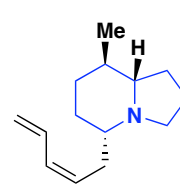
indolizidine 207A



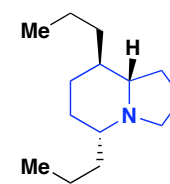
indolizidine 205A



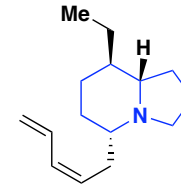
indolizidine 235B'



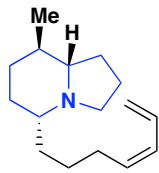
indolizidine 203A



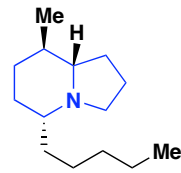
indolizidine 209I



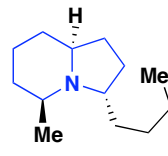
indolizidine 217B



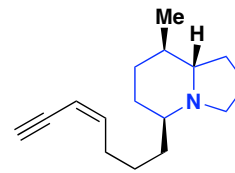
indolizidine 233D



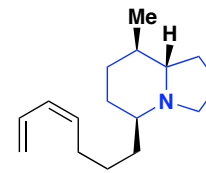
indolizidine 209B



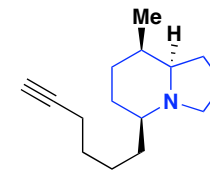
indolizidine 195B



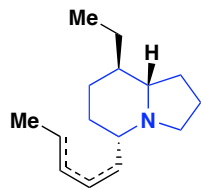
indolizidine 231C



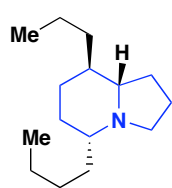
indolizidine 233D



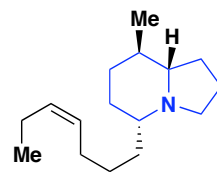
indolizidine 219F



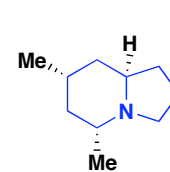
indolizidine 221I



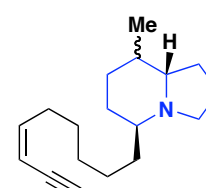
indolizidine 223J



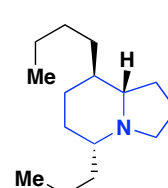
indolizidine 235B''



dendroprimine



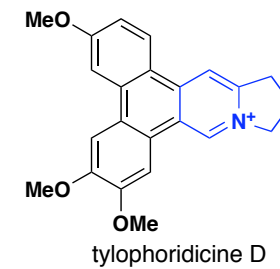
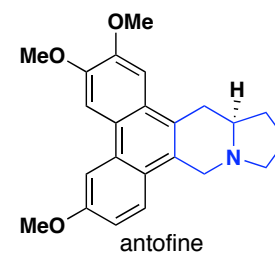
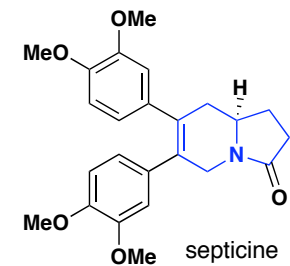
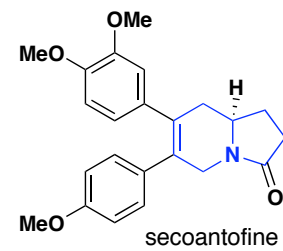
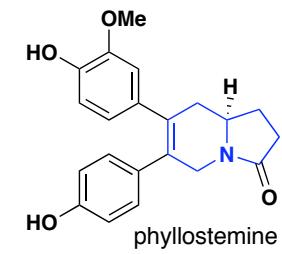
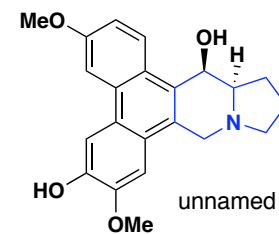
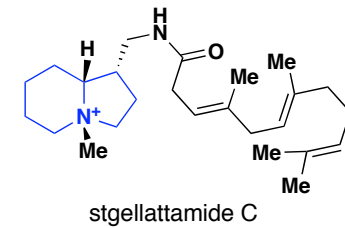
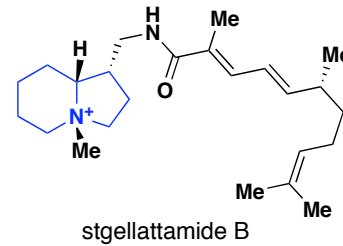
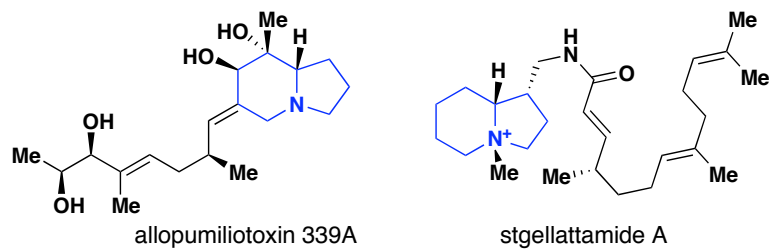
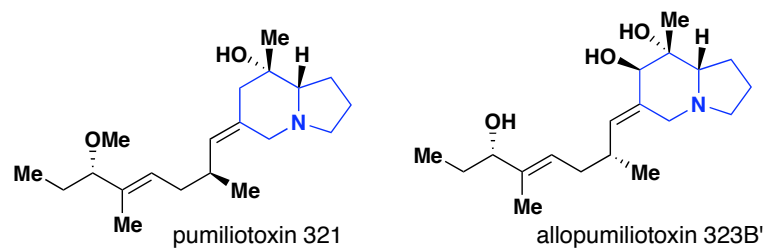
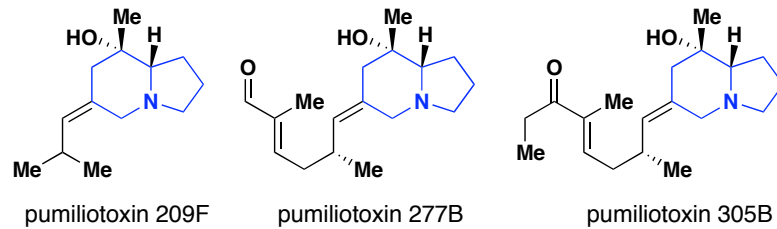
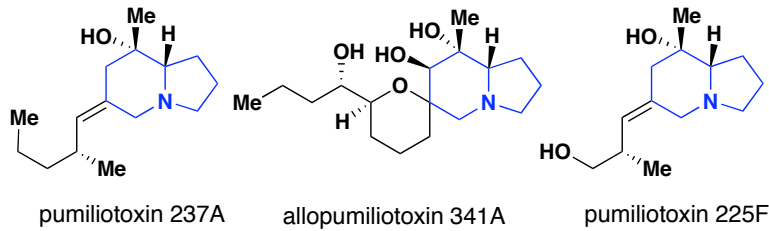
indolizidine 259B



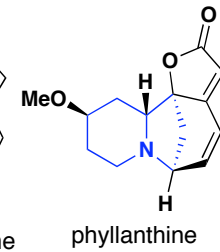
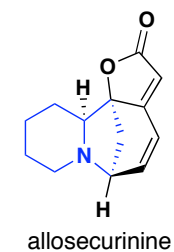
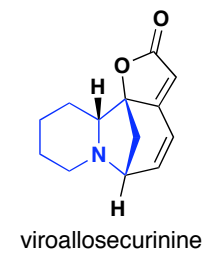
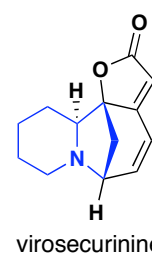
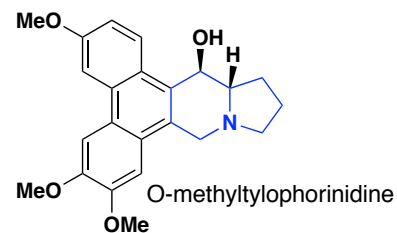
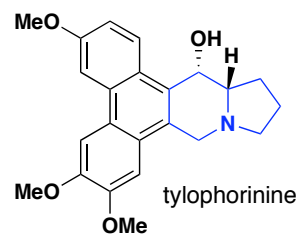
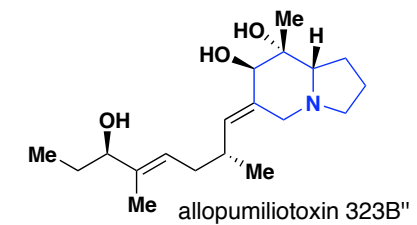
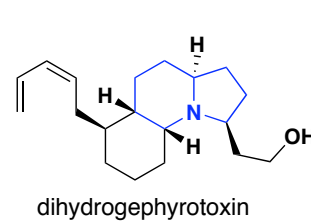
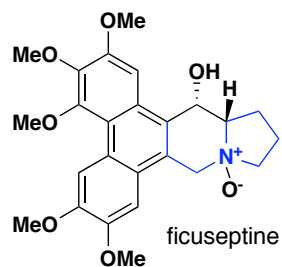
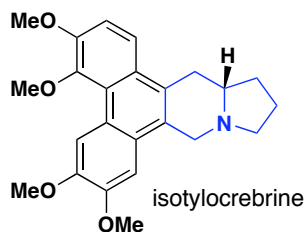
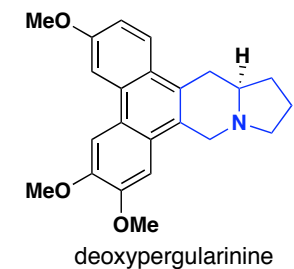
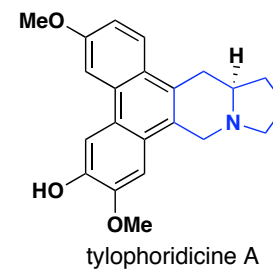
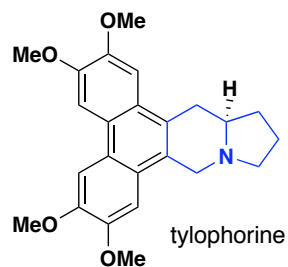
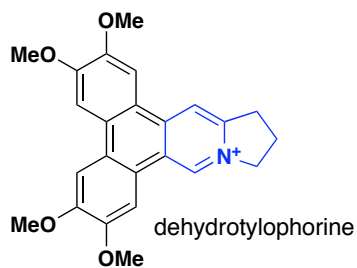
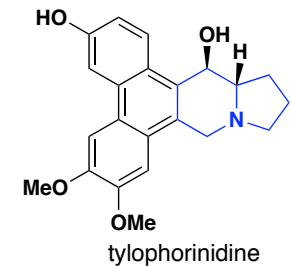
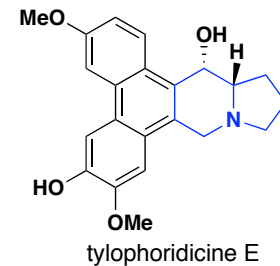
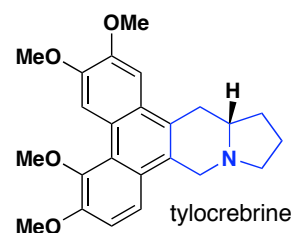
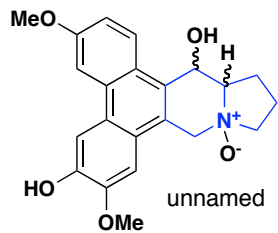
indolizidine 223V



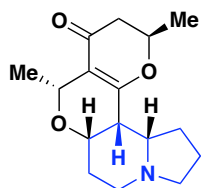
## Other Indolizidine Containing Natural Products:



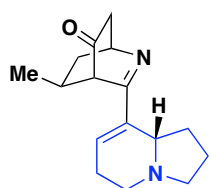
## Other Indolizidine Containing Natural Products:



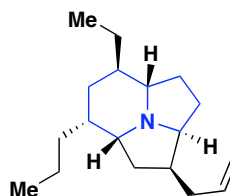
## Other Indolizidine Containing Natural Products:



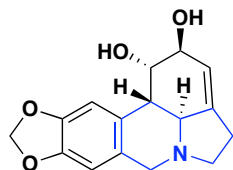
grandisine A



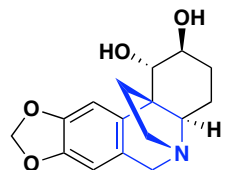
grandisine B



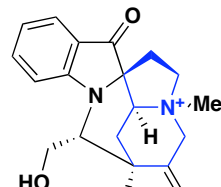
alkaloid 261C



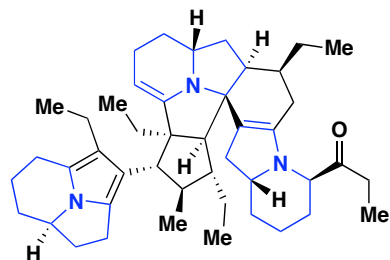
lycorine



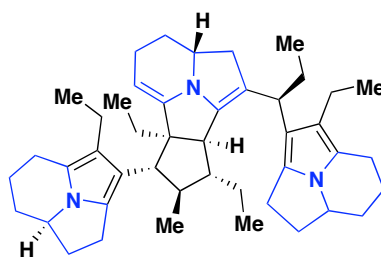
ambelline



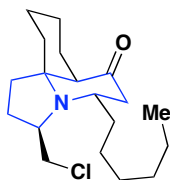
fluorocurine



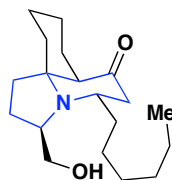
myrmicarin 663



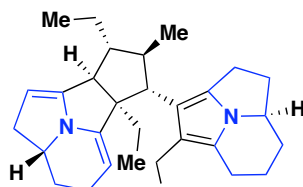
myrmicarin 645



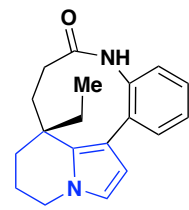
cylindricine A



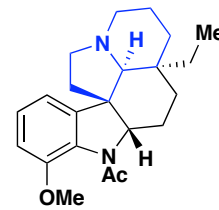
cylindricine B



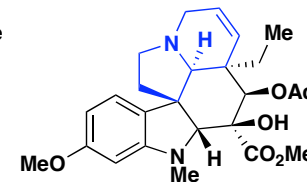
myrmicarin 430



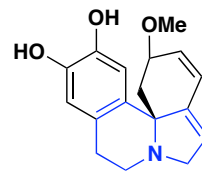
rhazinal



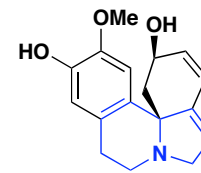
aspidospermine



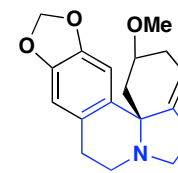
vindoline



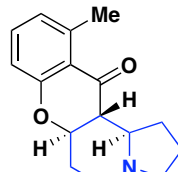
erythraline



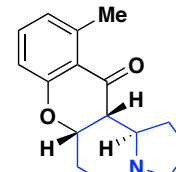
erysonine



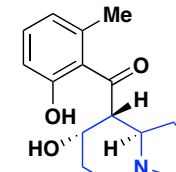
erythramine



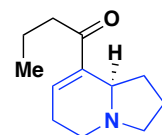
elaecarpine



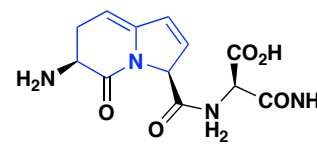
isoelaecarpine



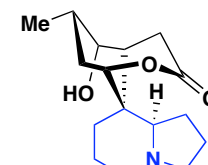
isoelaecarpine



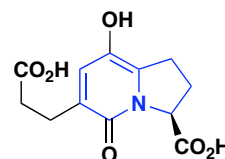
elaekanine A



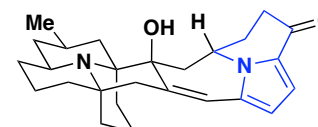
pantocin A



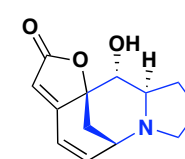
serratezomine A



A58365

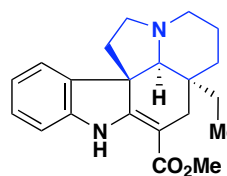


chilcorine D

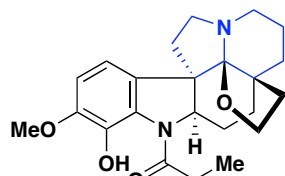


secu'amamine A

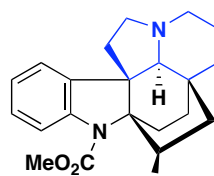
Other Indolizidine Containing Natural Products:



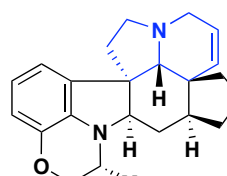
vincadifformine



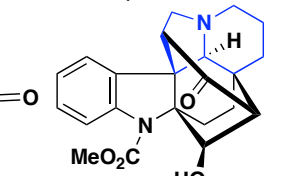
aspidoalbine



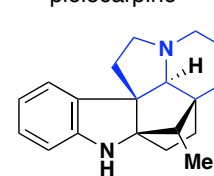
pleiocarpine



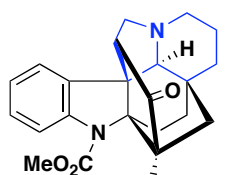
neblinine



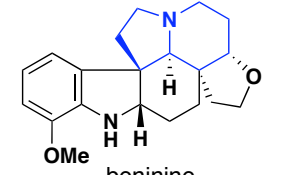
fruticosine



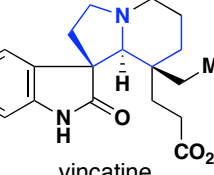
tuboxenine



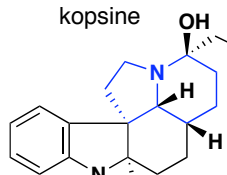
kopsine



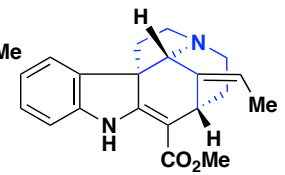
beninine



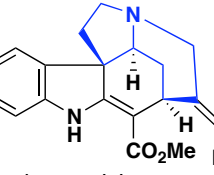
vincatine



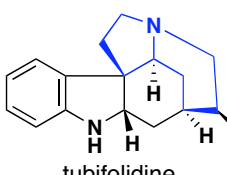
pandoline



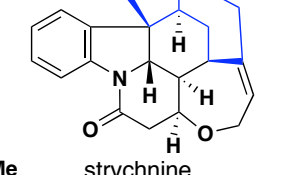
condylocarpine



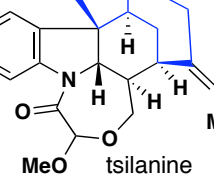
akuammicine



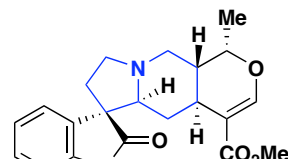
tubifolidine



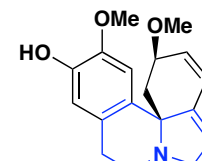
strychnine



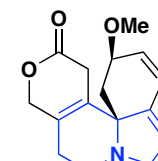
tsilanine



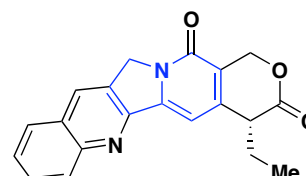
mitraphylline



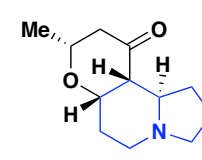
erysodine



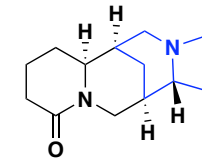
erythroidine



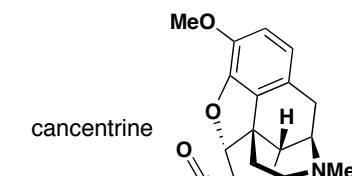
camptothecin



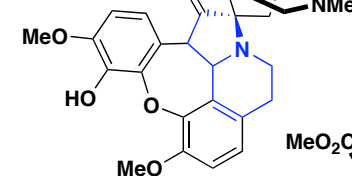
elaeokanine E



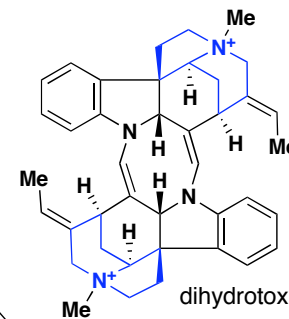
camoensidine



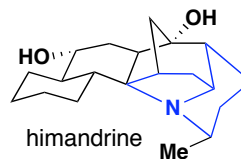
cancentrine



daphniyunnine



dihydrotoxiferine



himandrine

Other Indolizidine containing natural products (that I didn't feel like drawing):

- |                |                |
|----------------|----------------|
| vinblastine    | vincristine    |
| toxiferine I   | curarine I     |
| alkaloid E     | alkaloid F     |
| calebassine    | pteropodine    |
| speciophylline | uncarine F     |
| alkaloid H     | alkaloid A     |
| alkaloid G     | isopteropodine |