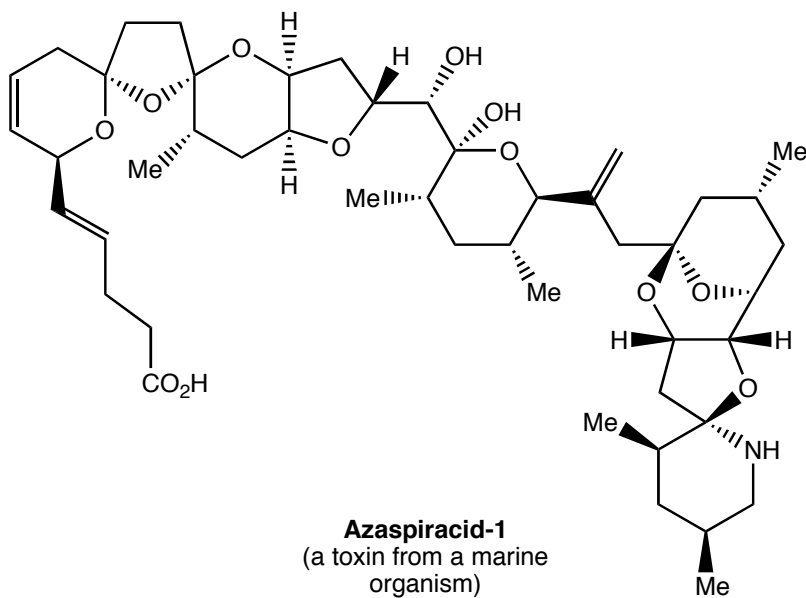
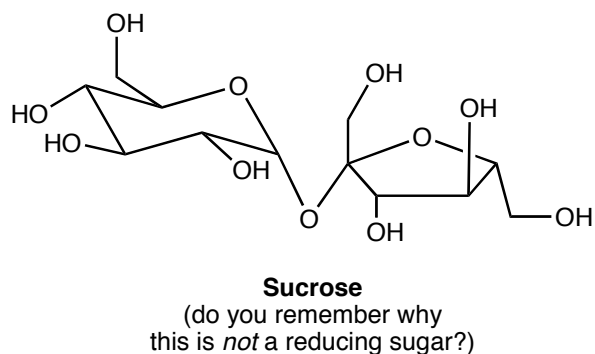
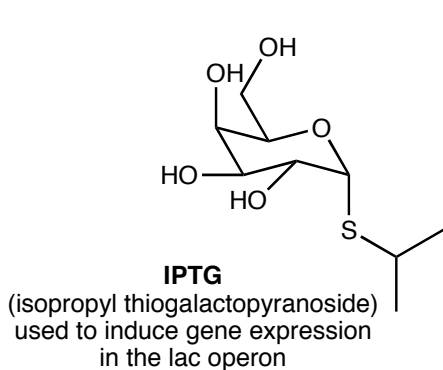
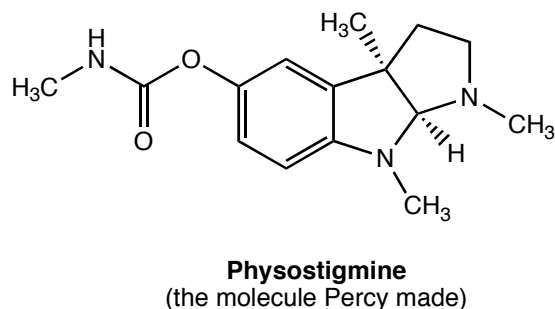
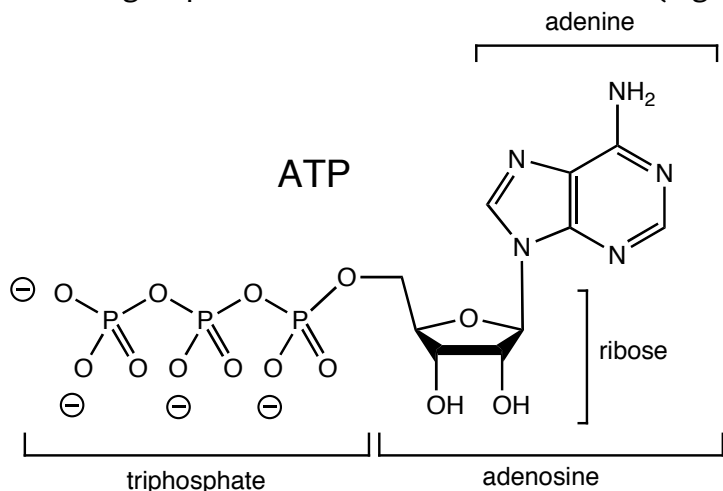


### Study Question 5

1. The following molecules all contain hemi-acetals, acetals, hemi-ketals, ketals, aminals, and related functional groups. Circle them and describe them (e.g. hemi-ketal).



2. "Undo" the structure of physostigmine to show the hidden carbonyl group. Now draw a mechanism showing how physostigmine forms. Use acid catalysis.

3. Draw a mechanism for the acid hydrolysis of IPTG to give glucose and other products (which will become clear as you work the mechanism).