

Quiz #8

A reaction scheme is shown on the next page. In the right hand column are the reactions catalyzed by transketolase which we considered in class. In the left hand column are the reactions carried out by aldolase. The two pathways are really quite parallel; the structures at a given horizontal level are analogous (until the last step, and the analogous resonance structures are offset to save space).

Note: whether or not you studied any of these reactions is largely immaterial – the transketolase pathway is nearly complete and you can reason mechanistically and analogistically. Long live the power of thinking mechanistically!

1. Fill in the missing structures each place there is a box. ✓
2. Where C–C bonds are forming or breaking, put a wavy line through the bond (on your structures and mine).
3. Provide a name/descriptor for each of the following:

Name the new functional group in structure A imine

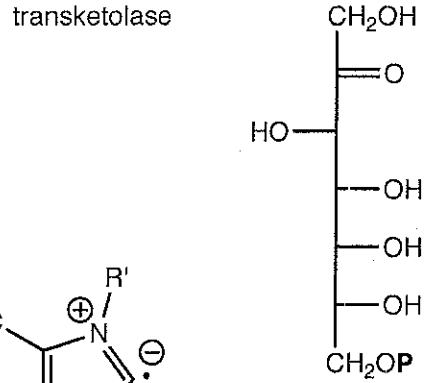
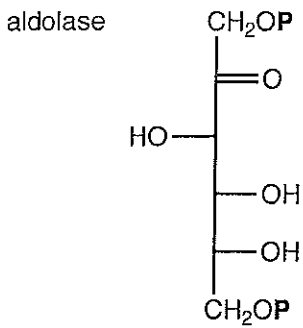
What kind of nitrogen-containing functional group is present in B? enamine

C is the ylide form of the cofactor thiamin pyrophosphate or TPP

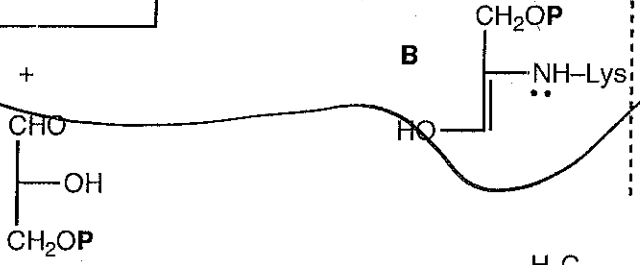
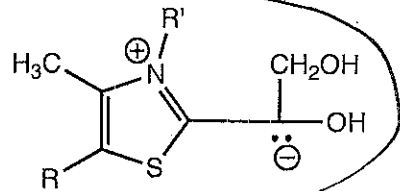
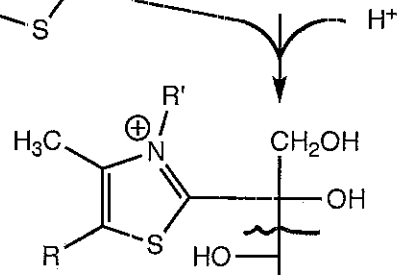
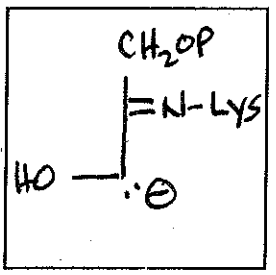
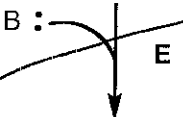
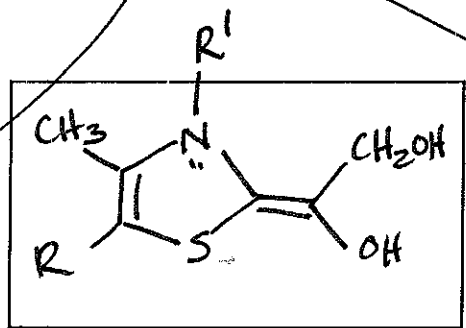
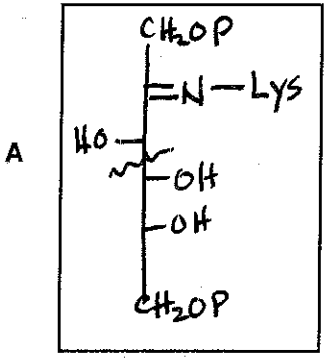
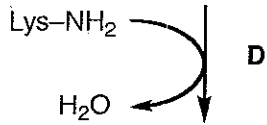
The mechanism of reaction D is nucleophilic addition to C=O
followed by an elimination (of H₂O)

The name of the reaction occurring in E is retro-aldol

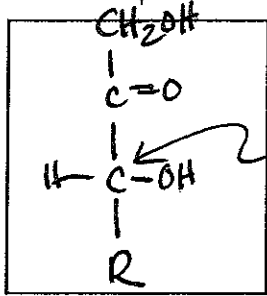
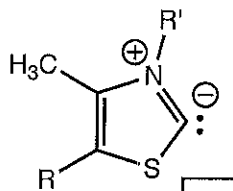
The name of the reaction occurring in F is hydrolysis



The key point is that both of these structures provide a means of accepting the e^- from the retro-aldol *



* they are elaborate LG's



either stereochem is fine here

