# ABE 580

Chapter 7

Enzymes

# Example I – Laundry Enzyme

- Create a model for the production of α-amylase (3.2.1.1) from *Bacillus lichenformis*

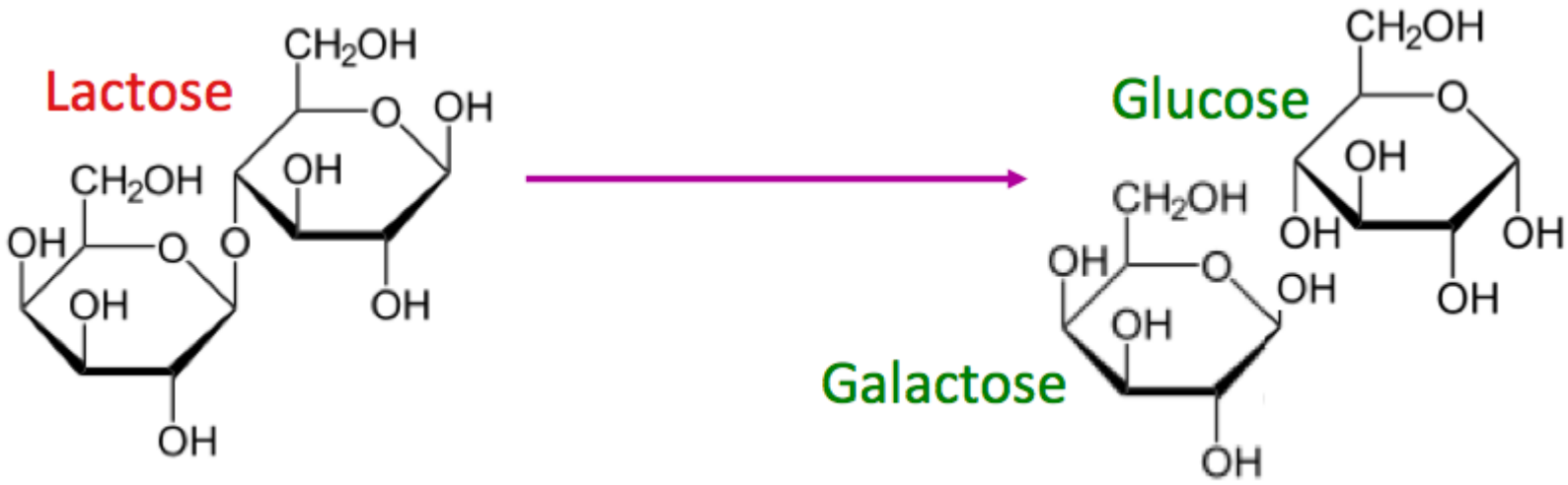
- An additive to remove starch-based stains.

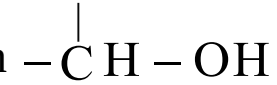
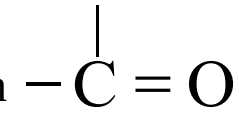
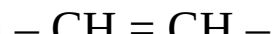
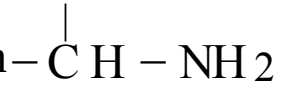
# Example I – α-amylase (3.2.1.1) from *Bacillus lichenformis*

- Cofactors
- Activity (kcat, Km)
- Inhibitors
- Possible conditions

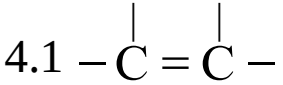
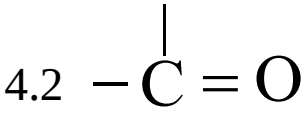
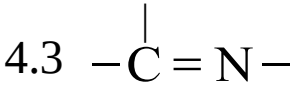
# Example II – Lactose removal

- Find an enzyme that does the following reaction:



1. Oxido-reductases
   (Oxidation-reduction reactions)
   1.1 Acting on 
   1.2 Acting on 
   1.3 Acting on 
   1.4 Acting on 
   1.5 Acting on
   1.6 Acting on NADH; NADPH
2. Transferases
   (Transfer of functional groups)
   2.1 One-carbon groups
   2.2 Aldehydic or ketonic groups
   2.3 Acyl groups
   2.4 Glycosyl groups
   2.7 Phosphate groups
   2.8 S-containing groups

3. Hydrolases
   (Hydrolysis reactions)
   3.1 Esters
   3.2 Glycosidic bonds
   3.3 Peptide bonds
   3.4 Other C – N bonds
   3.5 Acid Anhydrides

4. Lyases
   (Addition to double bonds
   4.1 
   4.2 
   4.3 

5. Isomerases
   (Isomerization reactions)
   5.1 Racemases

6. Ligases
   (Formation of bonds with
   ATP cleavage)
   6.1 C – O
   6-2 C – S
   6.3 C – N
   6.4 C – C

# Example II – Lactose removal

- Which one is better?

- Parameters
- Conditions
- Availability
- Express on another organism?