

## ENZYME CLASSIFICATION

### 1. OXIDOREDUCTASES

- catalyze oxidation-reduction reactions
- dehydrogenases, reductases
- *lactate dehydrogenase* (NAD<sup>+</sup>), *acyl CoA dehydrogenase* (FAD), *ketoacyl-ACP reductase* (NADPH/H<sup>+</sup>)

### 2. TRANSFERASES

- catalyze functional group transfers
- kinases, aminotransferases, thiolases
- *glucokinase* (ATP), *aspartate aminotransferase* (PLP), *-ketothiolase*

### 3. HYDROLASES

- catalyze hydrolysis reactions
- peptidases, glycosidases, lipases, phosphatases
- *trypsin*, *amylase*, *triacylglycerol lipase*, *fructose-1,6-bisphosphatase*

### 4. LYASES

- catalyze elimination (or addition) of groups to form (or break) double bonds
- synthases, decarboxylases, dehydratases
- *citrate synthase*, *pyruvate decarboxylase* (TPP), *fumarase*

### 5. ISOMERASES

- catalyze reactions that alter structure, not composition (optical, geometric, or structural isomers)
- isomerases, mutases
- *glucose-6-phosphate isomerase*, *phosphoglycerate mutase*

### 6. LIGASES

- catalyze coupling of two compounds along with hydrolysis of a phosphoanhydride bond
- synthetases, carboxylases, polymerases
- *glutamine synthetase* (ATP), *pyruvate carboxylase* (biotin), *DNA polymerase*