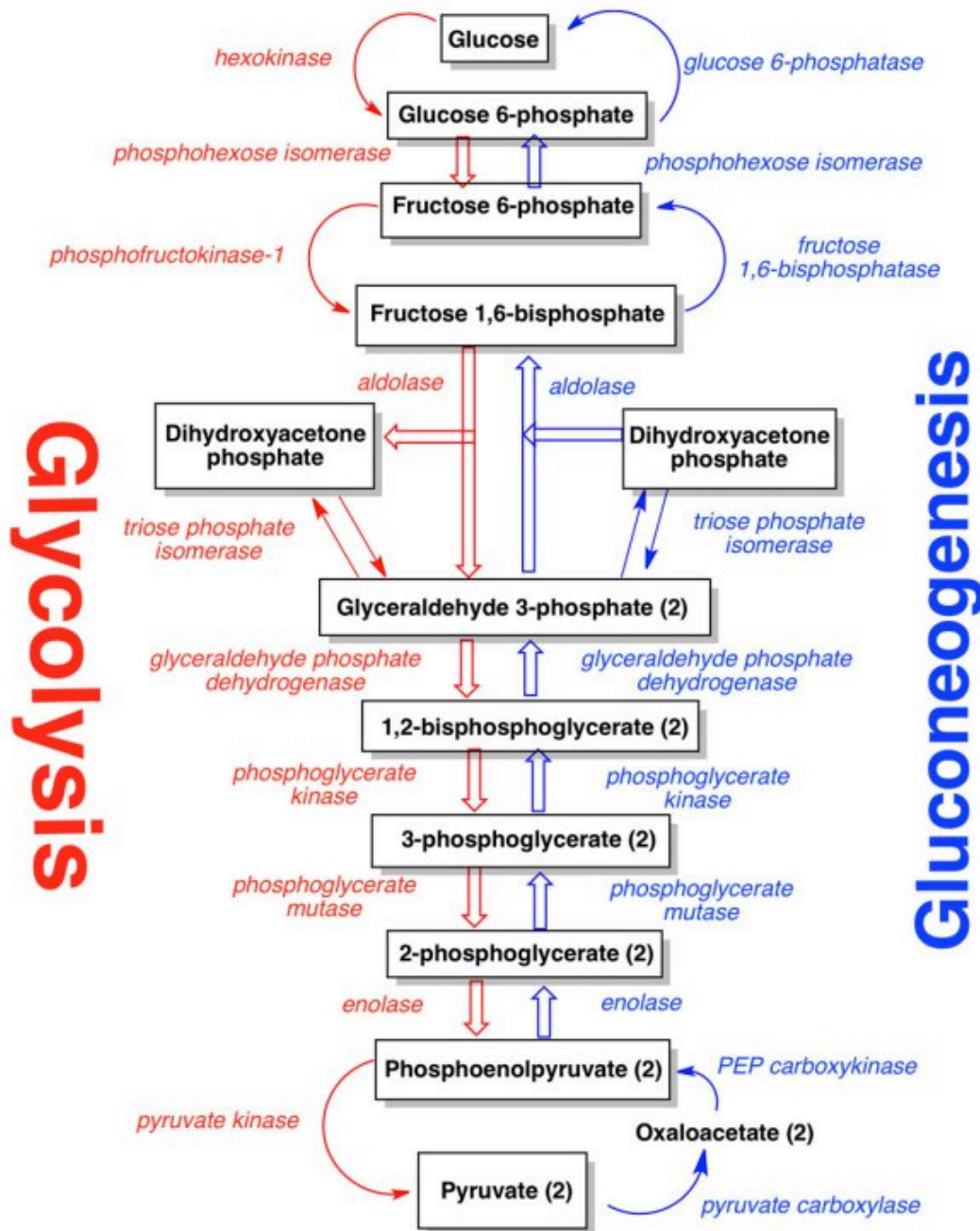


CONCEPT: GLUCONEOGENESIS

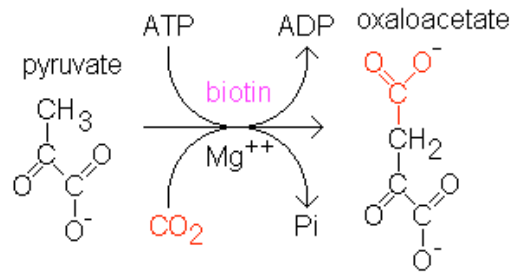
- Gluconeogenesis uses many of the same enzymes as glycolysis because their reactions are readily reversible
 - Reactions 1, 3, and 10 cannot simply be reversed because they are too favorable, new enzymes required
- Gluconeogenesis creates glucose from a variety of feeder molecules
 - Fats – only glycerol can enter gluconeogenesis
 - Amino acids – only L and K are unable to be gluconeogenic, others can only contribute certain carbons
 - Lactate can be converted to pyruvate



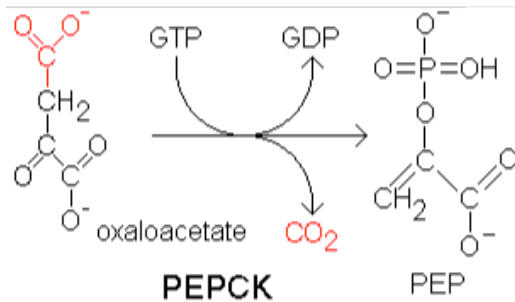
- 2 Pyruvate + 4 ATP + 2GTP + 2NADH are used to form one glucose
- Glycolysis and gluconeogenesis occur in the cytosol, but don't occur simultaneously
 - The two pathways are tightly regulated so they don't become a futile cycle

CONCEPT: GLUCONEOGENESIS

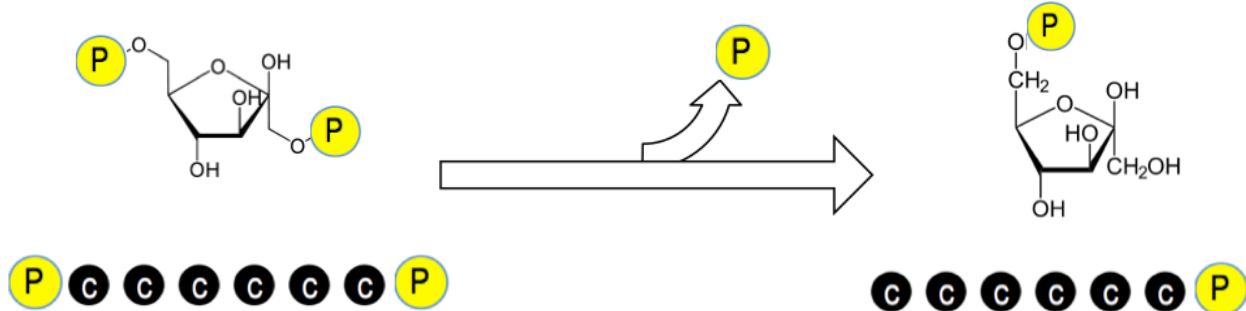
- Cannot reverse pyruvate kinase, must convert pyruvate to oxaloacetate before PEP
- Pyruvate carboxylase – pyruvate + ATP → oxaloacetate + ADP
 - Adds CO₂ to pyruvate



- PEP carboxykinase – oxaloacetate + GTP → PEP + GDP
 - Removes CO₂ and phosphorylates



- Fructose 1,6-bisphosphatase reverse the action of PFK-1 (fructose 1,6-bisphosphate → fructose 6-phosphate)



- Glucose 6-phosphatase reverse the action of hexokinase (glucose 6-phosphate → glucose)
 - Enzyme is only present in liver cells

