

Glyceraldehyde-3-Phosphate

[Glitter-Pie \(3\)-Tree Fonz-Fairy](#)

G3P is formed, along with DHAP, by the conversion of F1,6BP by ALDO in a reversible reaction. Later in glycolysis, G3P is used as a substrate for 1,3-bisphosphoglycerate (1,3BPG). DHAP works as an intermediate that can leave the cycle and form fat or be converted into G3P by the enzyme triosephosphate isomerase (TPI) for entry back into the cycle.

1,3-bisphosphoglycerate

[\(1\)-Wand \(3\)-Tree with 2 Fonz-Fairies with Glitter](#)

1,3BPG is an intermediate compound of glycolysis, and signifies the beginning of the “payoff” phase of glycolysis which creates energy-rich molecules. Two molecules are formed from the conversion of G3P by the enzyme glyceraldehyde phosphate dehydrogenase (GAPDH). 1,3BPG is important because of its ability to form ATP by phosphorylating adenosine diphosphate (ADP). Remember that products in each subsequent step should be doubled or accounted for two times since two molecules were created in this step.

3-phosphoglycerate

[\(3\)-Tree Fonz-Fairy with Glitter](#)

In an ATP-producing step, 1,3BPG is dephosphorylated by the enzyme phosphoglycerate kinase (PGK), forming 3-phosphoglycerate (3PG).

2-phosphoglycerate

[\(2\)-Tutu on Fonz-Fairy with Glitter](#)

The enzyme phosphoglycerate mutase (PGM) catalyzes a transfer of a phosphate group from the third carbon to the second carbon on 3PG, working to convert it to 2-phosphoglycerate (2PG).

Phosphoenolpyruvate (PEP)

[Fonz-Fairy-Eats-Pie-with-Roots](#)

Phosphoenolpyruvate, or PEP, is formed when the enzyme enolase (ENO) acts on 2PG. PEP contains the highest energy phosphate bond found in living organisms, and when it is dephosphorylated by pyruvate kinase (PK), ATP is formed.

Pyruvate Kinase

[Pie-with-roots-Kite-Ace](#)

The enzyme PK acts to remove the phosphate group from PEP, forming ATP and pyruvate.

Pyruvate

[Pie-with-Roots](#)

Pyruvate is formed from the dephosphorylation of PEP by the enzyme PK. It is an alpha-keto acid, and after glycolysis, this molecule is decarboxylated by the enzyme pyruvate dehydrogenase (PDH) to form acetyl-CoA.

Pyruvate Dehydrogenase

[Pie-root Dehydrator](#)

The enzyme PDH decarboxylates pyruvate to form acetyl-CoA.

Acetyl-CoA

[Seagull CoA-purse](#)

Acetyl-CoA is formed from the decarboxylation of pyruvate by the enzyme PDH. This molecule then enters the tricarboxylic acid (TCA) cycle, also known as the citric acid cycle and Krebs cycle, where the acetyl group is further oxidized to carbon dioxide (CO₂) and H₂O. Subsequently, the energy that is released is captured in the form of 11 ATP.