

BIOMOLECULES

METABOLIC BASIS FOR LIVING

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- Metabolic pathways can lead to a more complex structure from a simpler structure (for example, acetic acid becomes cholesterol) or lead to a simpler structure from a complex structure (for example, glucose becomes lactic acid in our skeletal muscle).
- The former cases are called biosynthetic pathways or **anabolic** pathways. The latter constitute degradation and hence are called catabolic pathways.
- Anabolic pathways, as expected, consume energy. Assembly of a protein from amino acids requires energy input.
- On the other hand, **catabolic** pathways lead to the release of energy. For example, when glucose is degraded to lactic acid in our skeletal muscle, energy is liberated.
- This metabolic pathway from glucose to lactic acid which occurs in 10 metabolic steps is called glycolysis.
- Living organisms have learnt to trap this energy liberated during degradation and store it in the form of chemical bonds. As and when needed, this bond energy is utilised for biosynthetic, osmotic and mechanical work that we perform.
- The most important form of energy currency in living systems is the bond energy in a chemical called adenosine triphosphate (ATP).