# The Kreb's Cycle

## Introduction

- Also known as the citric acid cycle or TCA cycle
- Named after Sir Hans Krebs who discovered it in 1937
- A series of chemical reactions that occur in the mitochondria of eukaryotic cells

## Steps of the Kreb's Cycle

1. Acetyl CoA Formation
2. Pyruvate from glycolysis enters mitochondria
3. Carbon is removed from pyruvate, releasing CO2
4. Coenzyme A (CoA) attaches to the remaining molecule, forming Acetyl CoA
5. Citrate Synthesis
6. Acetyl CoA combines with oxaloacetate, forming citrate
7. Citrate is a 6-carbon molecule
8. Isomerization and Decarboxylation
9. Citrate is converted to its isomer, isocitrate
10. Isocitrate is then oxidized, releasing CO2 and producing NADH and alpha-ketoglutarate
11. Alpha-Ketoglutarate Oxidation
12. Alpha-ketoglutarate is oxidized, releasing CO2 and producing NADH and succinyl CoA
13. Succinate Production
14. Succinyl CoA is converted to succinate
15. GDP is converted to GTP, which is a high-energy molecule
16. Fumarate Production
17. Succinate is converted to fumarate, producing FADH2

## Summary

- The Kreb's cycle is a series of chemical reactions that occur in the mitochondria of eukaryotic cells
- It begins with the formation of Acetyl CoA, which combines with oxaloacetate to form citrate
- The cycle includes several steps that produce energy-rich molecules such as NADH, FADH2, and GTP
- The end result of the Kreb's cycle is the regeneration of oxaloacetate, which can combine with another acetyl CoA molecule to start the cycle again
- The Kreb's cycle is essential for the production of ATP, the main energy currency of cells.