



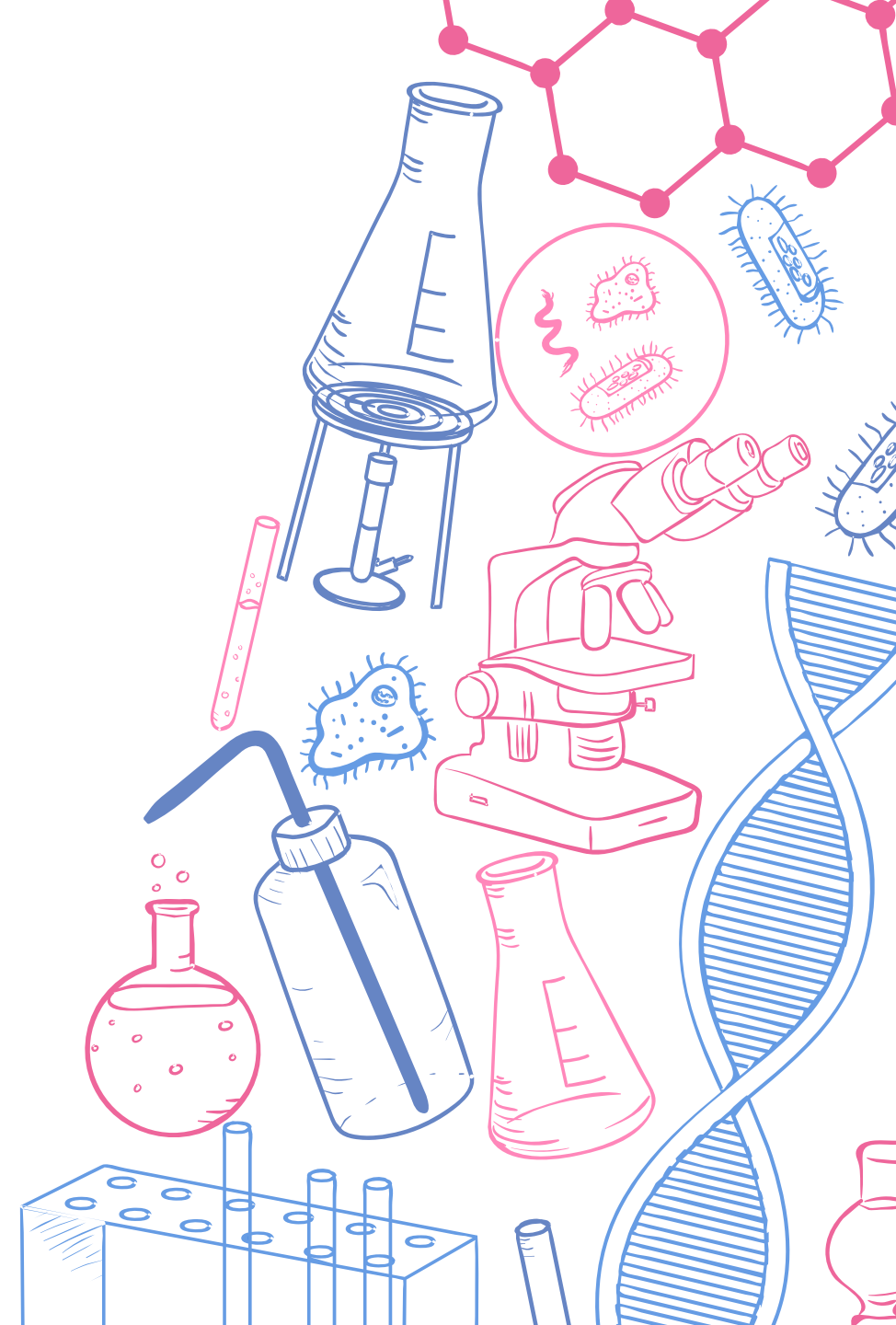
Citric Acid Cycle

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ILOs:

- List the significance of The Citric Cycle
- Mention the sources and Utilization of Acetyl-CoA
- Describe Steps of The Citric Cycle
- List the products of The Citric Cycle



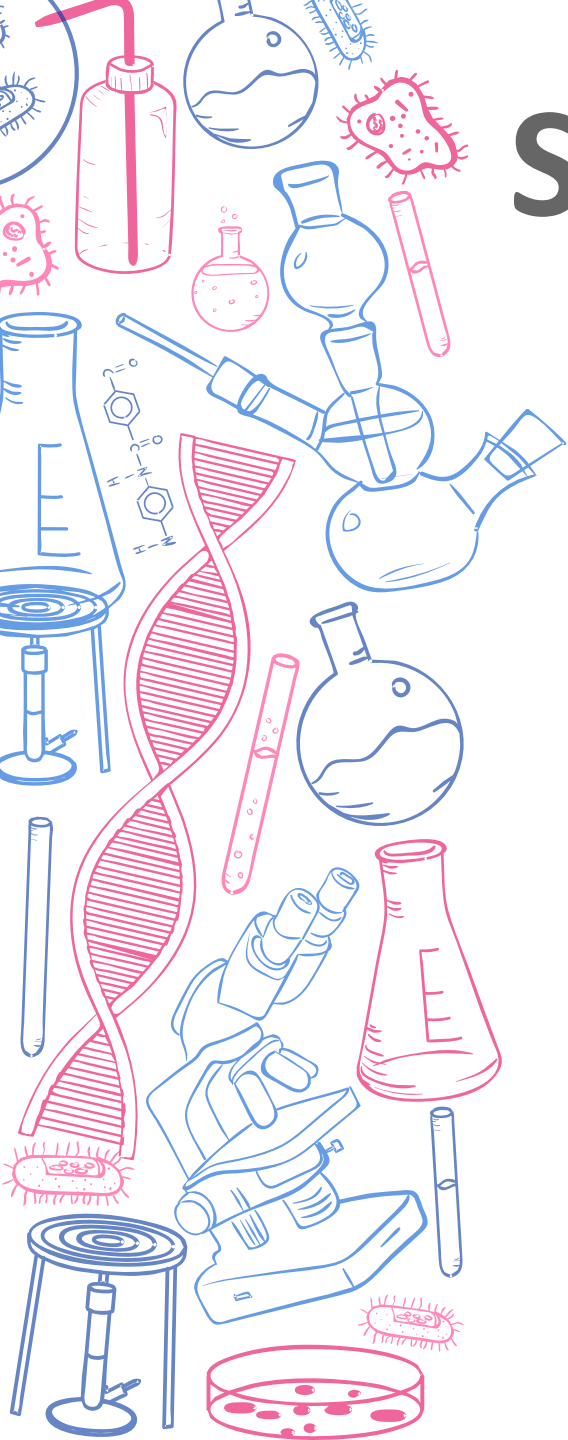


Introduction

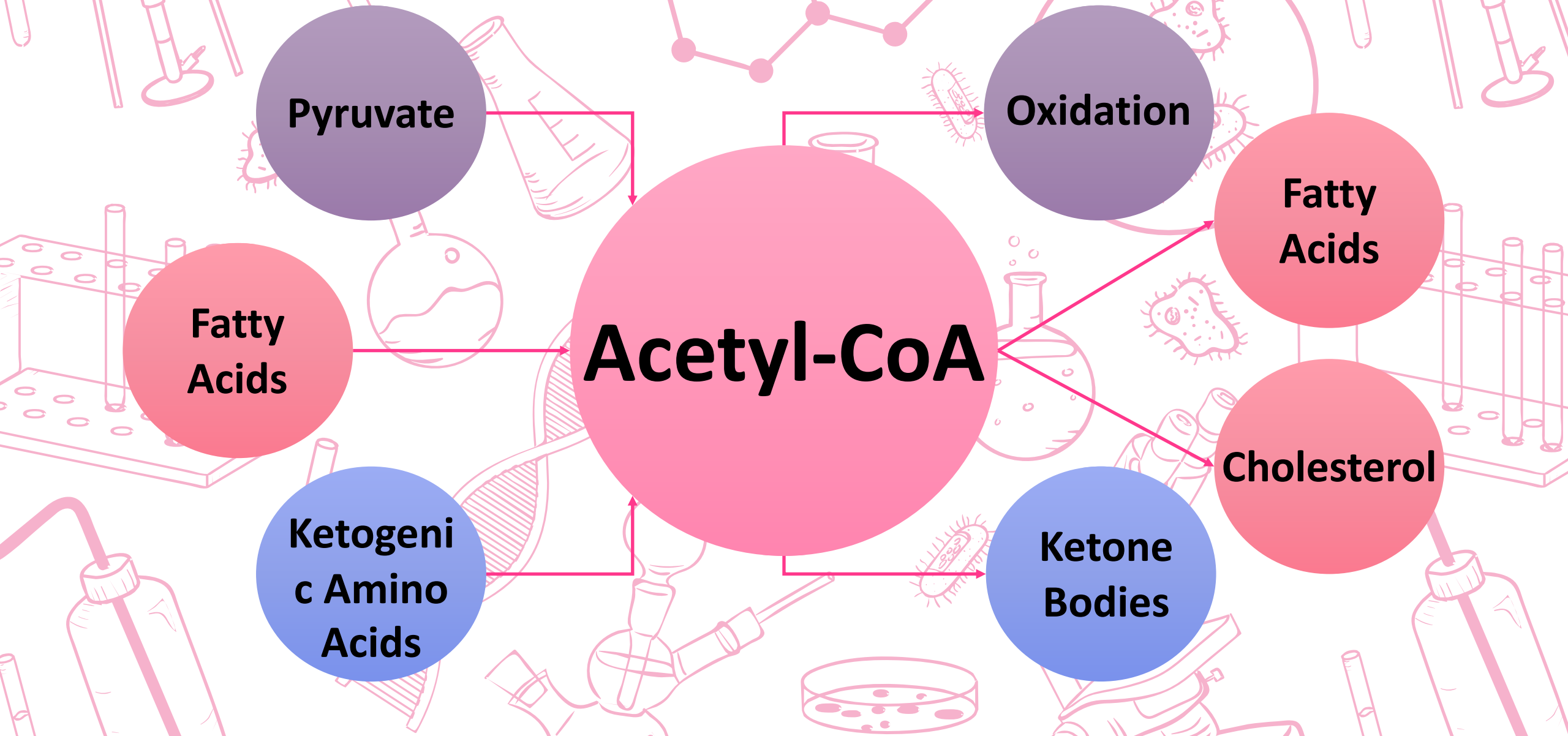
The citric acid cycle (tricarboxylic acid cycle or Krebs cycle), is the main source of energy for cells and an important part of aerobic respiration. The cycle harnesses the available chemical energy of acetyl-CoA into the reducing power of NADH. This metabolic process occurs in the mitochondria in eukaryotes and the cytosol in prokaryotes.

Significance of The Citric Cycle

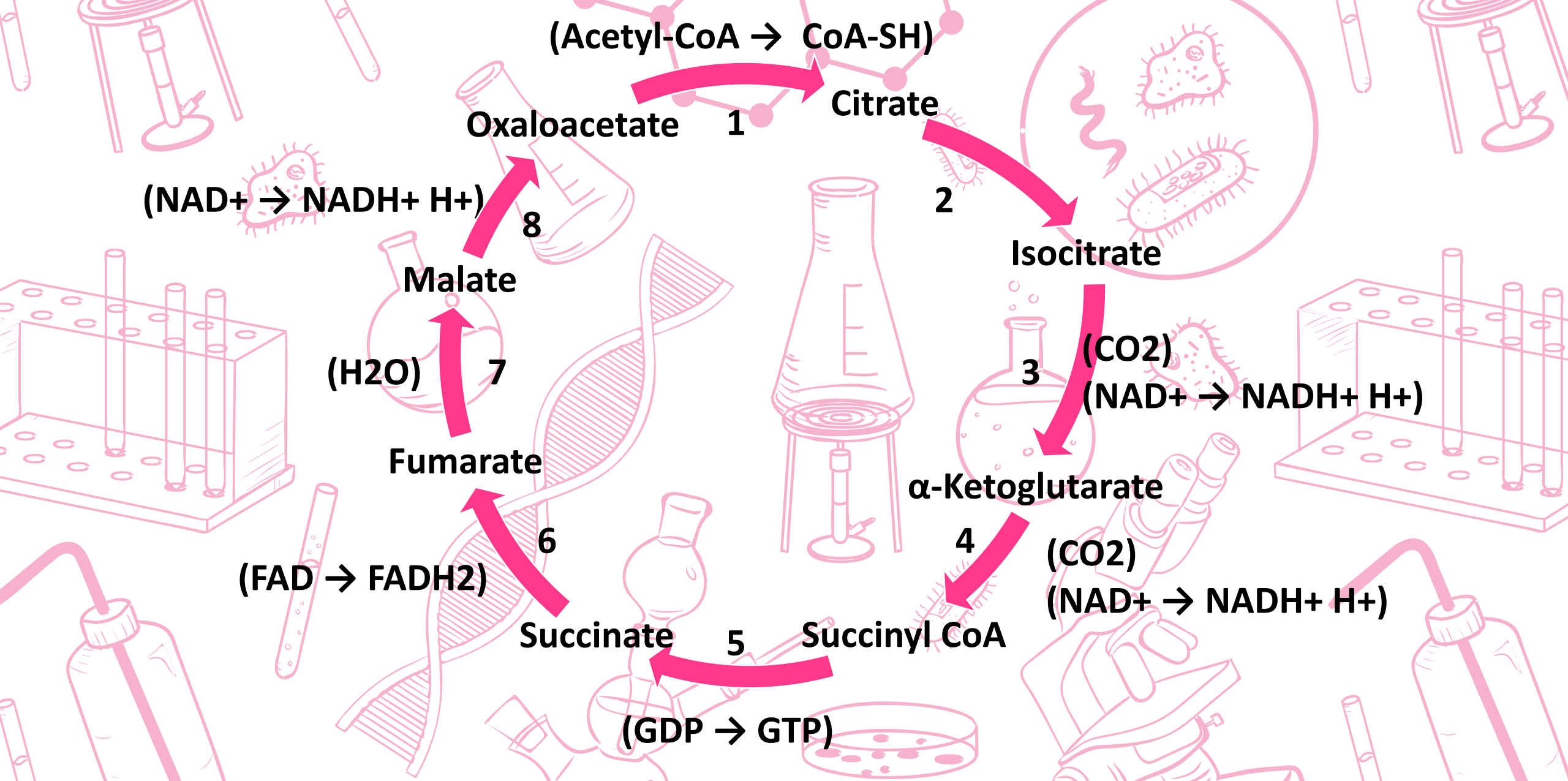
- Complete oxidation of acetyl-CoA
- ATP generation
- Final common oxidative pathway
- Integration of major metabolic pathways
- Fat is burned on the wick of carbohydrates
- Excess carbohydrates are converted as neutral fat
- No net synthesis of carbohydrates from fat
- Carbon skeletons of amino acids enter the citric acid cycle
- Amphibolic pathway
- Anaplerotic role



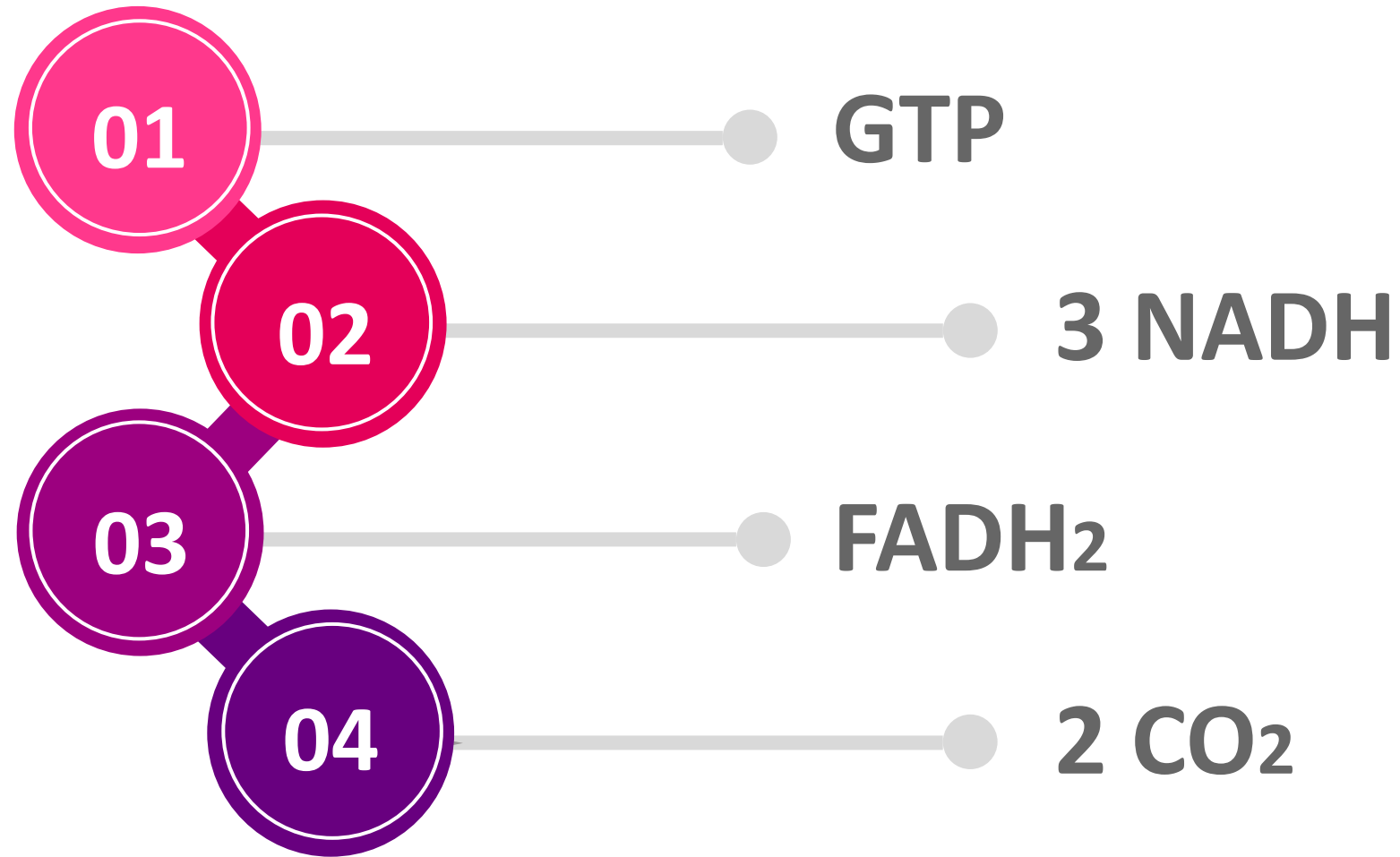
Sources and Utilization of Acetyl-CoA

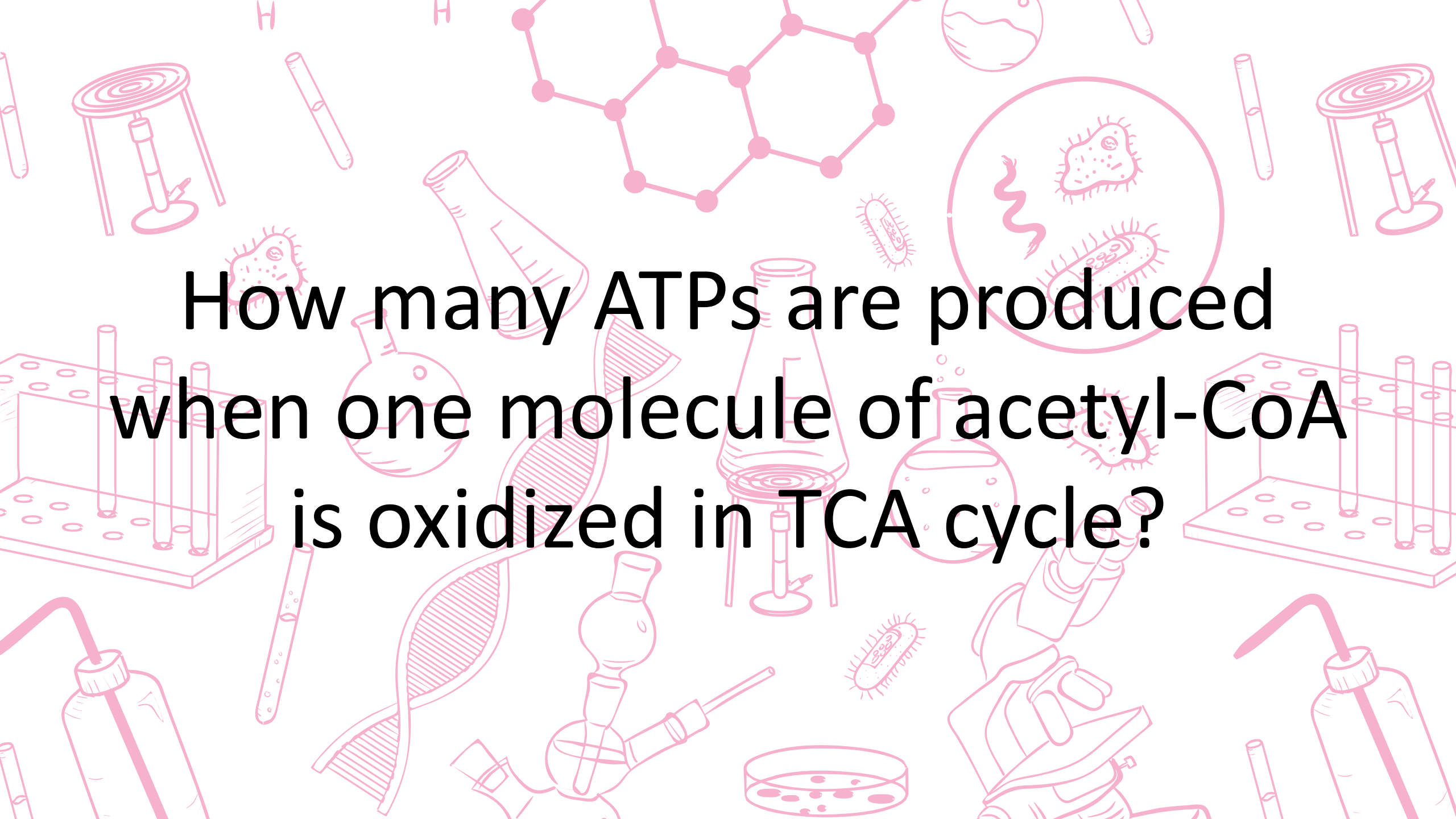


Steps of The Citric Acid Cycle



Products of The Citric Acid Cycle

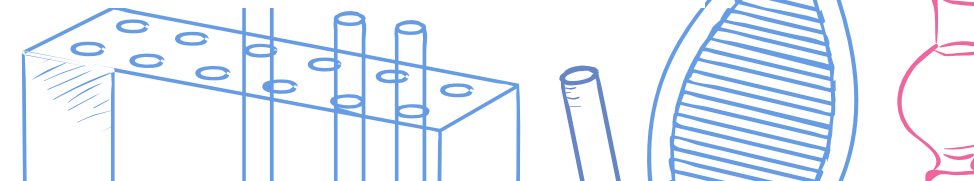




**How many ATPs are produced
when one molecule of acetyl-CoA
is oxidized in TCA cycle?**

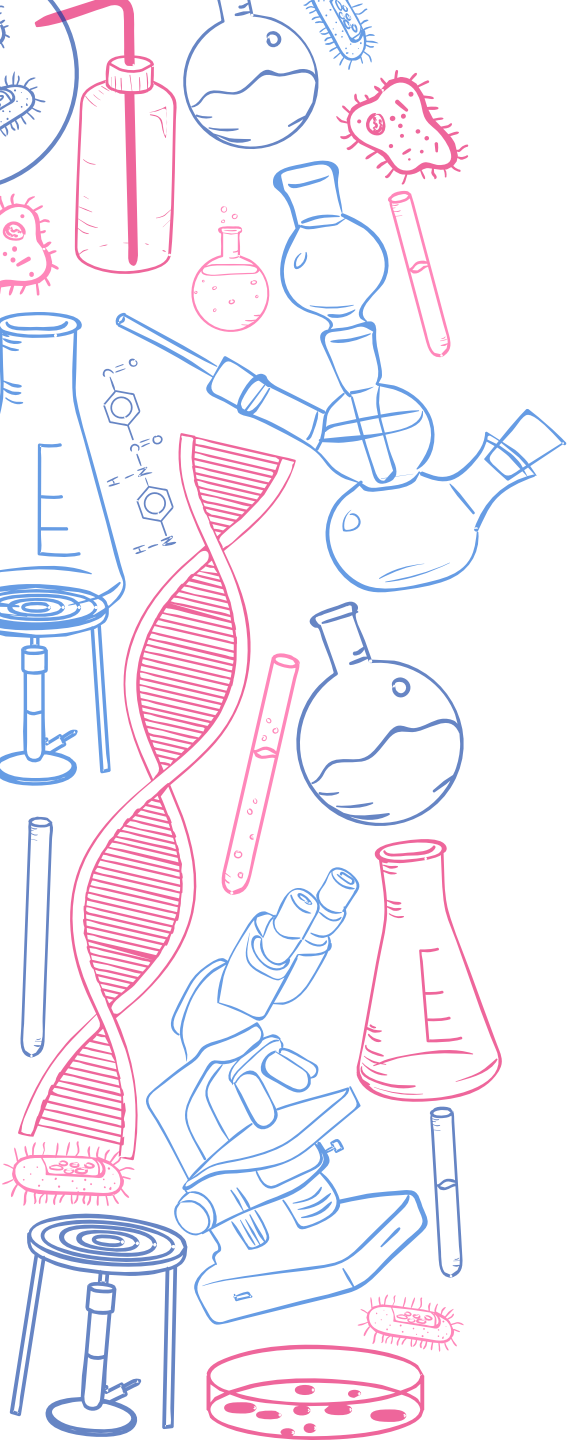
Summary

- The citric acid cycle is the final pathway for the oxidation of carbohydrate, lipid, and protein whose common end-metabolite is acetyl-CoA.
- The cycle is the major route for the generation of ATP and is located in the matrix of mitochondria.
- Each turn of the cycle forms one GTP or ATP as well as three NADH molecules and one FADH₂ molecule, which will be used in further steps of cellular respiration to produce ATP for the cell.



Sources

- https://www.researchgate.net/publication/327245799_Chapter-20_Citric_Acid_Cycle
- <https://www.britannica.com/science/tricarboxylic-acid-cycle>
- <https://www.sigmaaldrich.com/technical-documents/articles/biofiles/citric-acid-cycle.html>





Thanks!

Any questions?