

# Cysteine

Cysteine is a non-essential amino acid that, like methionine , has a **sulfur** atom in its molecule.

## Metabolism cysteine

Cysteine synthesis takes place in the human organism from **homocysteine** and **serine** .

The degradation of cysteine begins with the oxidation of the -SH group to -SO<sub>2</sub><sup>-</sup> by the enzyme cysteine dioxygenase. In the resulting **L-cysteine sulfinic acid** , the -NH<sub>2</sub> group is replaced by a keto group with the help of transaminase , and **β-sulfinylpyruvate** is formed . In the final reaction, it is split by desulfinase into **pyruvate** and sulfite (SO<sub>3</sub><sup>-</sup>), or final sulfate (SO<sub>4</sub><sup>-</sup>). Cysteine is an important source of **taurine** . L-cysteine sulfinic acid is decarboxylated to **hypotaurine** and subsequent oxidation of the -SO<sub>2</sub><sup>-</sup> - group to -SO<sub>3</sub><sup>-</sup> produces taurine.

Alternative non-oxidative degradation of cysteine produces **pyruvate** and **sulfane** (H<sub>2</sub>S).

## Importance

- In peptides, cysteine is essential for the formation of **disulfide bridges**.
- It is a substrate for **glutathione**.
- It is a substrate for **taurine**. The latter is conjugated with bile acids or other substances that increase their solubility in water.
- Decarboxylation of cysteine produces **cysteamine** , which is part of **coenzyme A**.
- It has a high proportion of **keratin** protein (hair, nails).

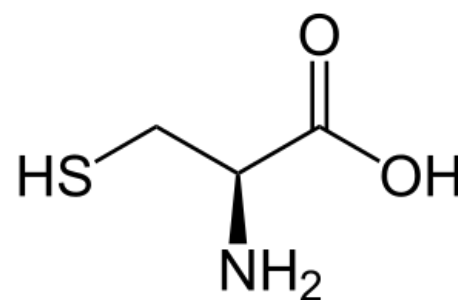
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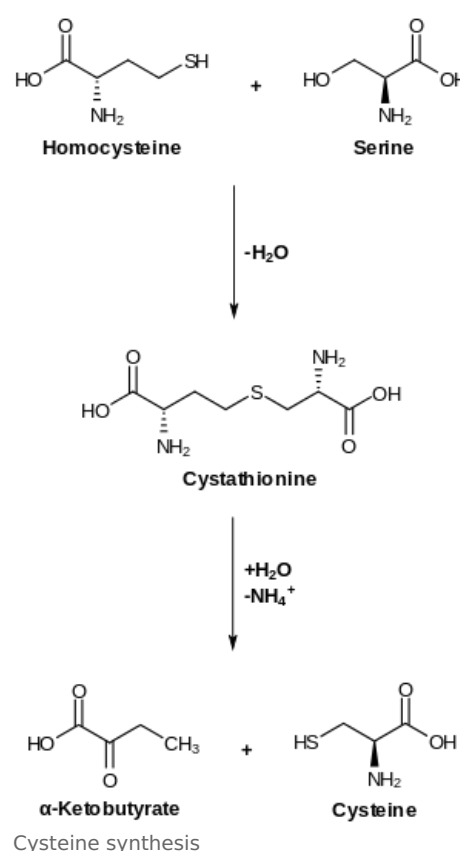
Aminoacids

### References

- MATOUŠ, Bohuslav, et al. *Fundamentals of medical chemistry and biochemistry*. 2010 edition. Prague: Galen, 2010. 0 pp. ISBN 978-80-7262-702-8 .



Cysteine molecule



Cysteine synthesis