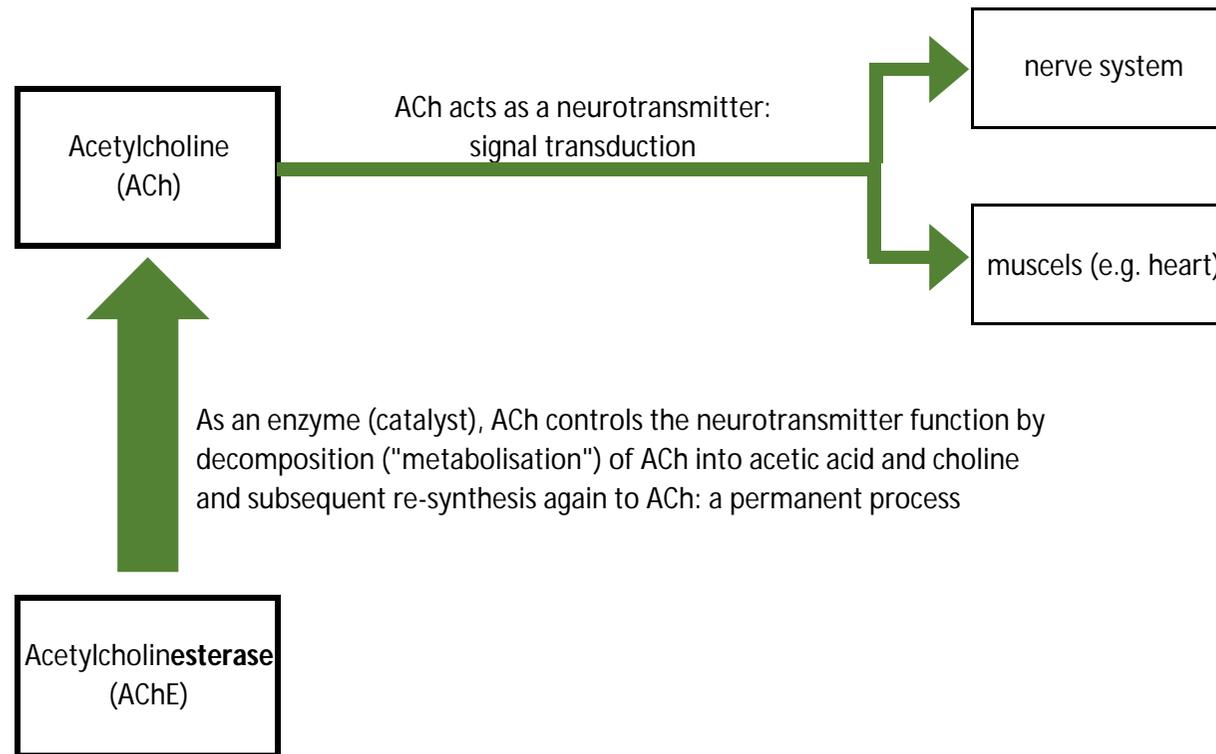


The (acetyl)cholinesterase-mechanism for muscle and nerve control

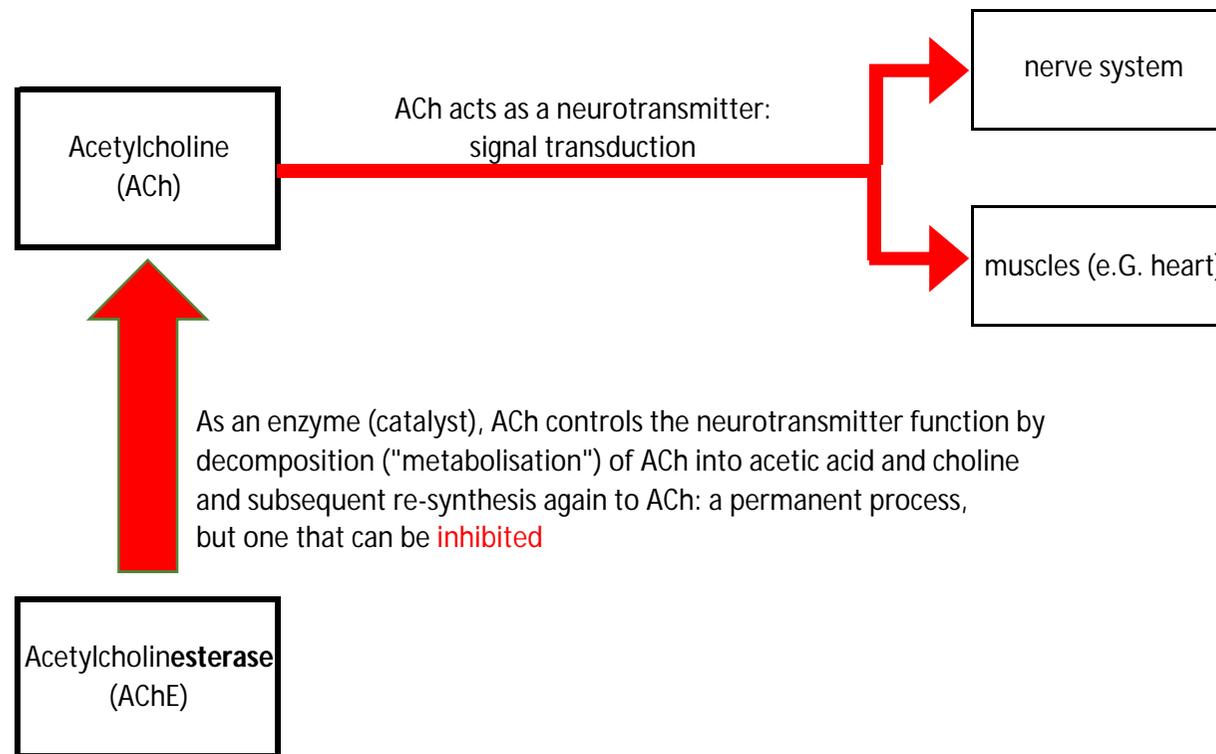


Practically every physical action (breathing, running and sitting down, speaking, thinking, etc.) is controlled by (biochemical) stimuli or signals that go from nerve to nerve and control the muscle cells: so-called neurotransmitters. This process is based - chemically speaking - on the release of the substance acetylcholine (ACh) and its subsequent splitting into acetic acid and choline. This is only possible with the catalyst function of the enzyme acetylcholinesterase (AChE).

Once a single signal has done its job, the two split substances are immediately reassembled ("synthesized").

The process can begin anew. And each time it works at lightning speed.

If this function of AChE is impaired, i.e. inhibited or blocked, the body begins to fail. One can no longer think clearly or only very slowly, the movement coordination of hands and feet is impaired and so is vision, etc. In the worst case, the entire musculature (heart, lungs, etc.) fails. Then everything is over.

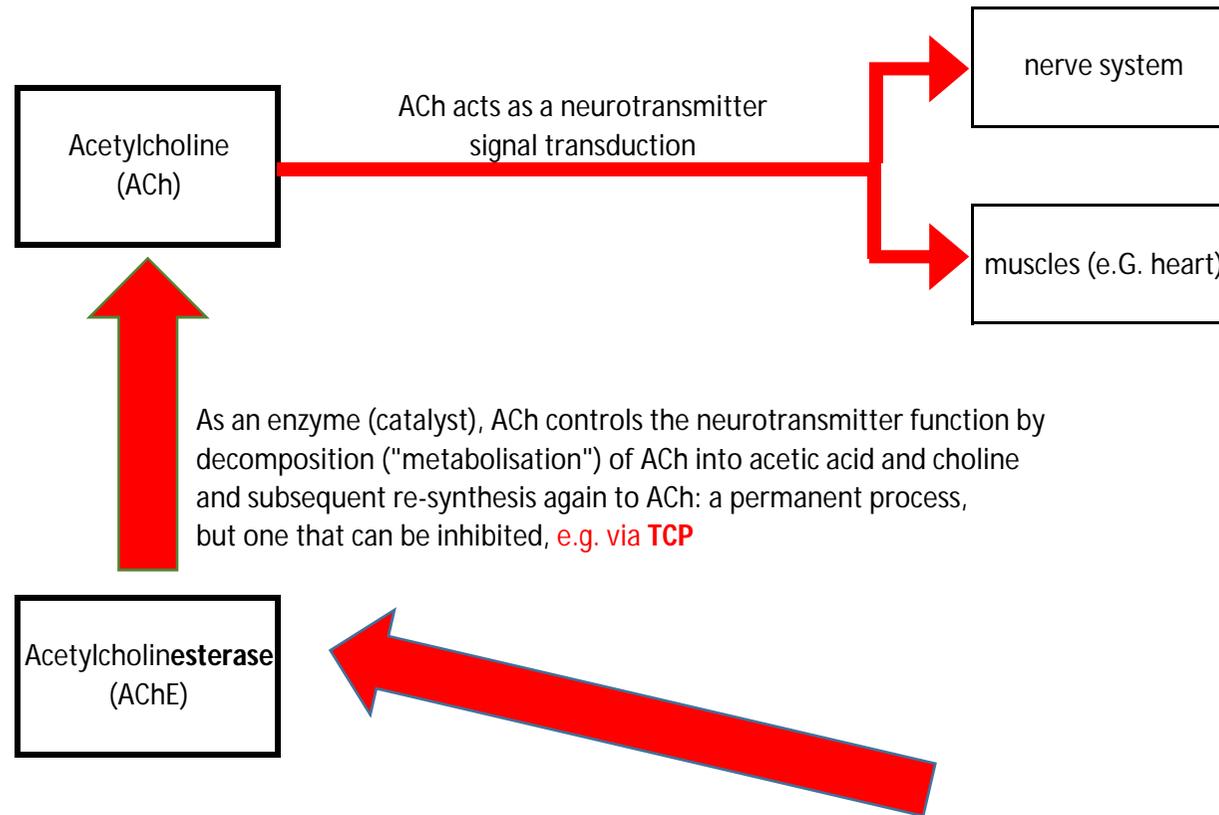


Potential inhibitors of the AChE process:

- 1) with irreversible consequences:
Phosphoric acid esters, such as
Organophosphates
Parathion ("E 605")
nerve poisons (e.g. Sarin, Novitchok)
- 2) with reversible consequences
e.g. Neostigmin

A distinction is made between reversible and irreversible AChE inhibitors. They are irreversible when they bind firmly with the enzyme AChE. Then the original triggers (e.g. poisons) are hardly detectable. Especially when time has passed. An inhibitor can only be detected indirectly: on the basis of the reduced enzyme activity in the impaired or damaged body cells and body functions.

The (acetyl)cholinesterase-mechanism for muscle and nerve control



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Inhibitor TCP (chemical group organo-phosphates)

If TCP enters the human organism, this happens:

1) the TCP molecule divides:

a) a small part is split off in the form of a cresol

b) the remaining molecule binds firmly and irreversibly with the enzyme AChE and is no longer detectable

2) the activity of AChE and ACh is inhibited depending on toxicity and the neurotransmitter-functions are blocked