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ACETYLO- I BUTYRYLOCHOLINOESTERAZA – budowa, funkcje i ich inhibitory

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Cholinesterases are divided into two enzyme classes according to their substrate specificity, behaviour towards excess substrate and susceptibility to inhibitors: acetylcholinesterase (AChE; E.C. 3.1.1.7) and butyrylcholinesterase (BChE; E.C. 3.1.1.8). The enzyme acetylcholinesterase plays an essential role in acetylcholine-mediated neurotransmission. BChE is of pharmacological and toxicological importance, because it hydrolyzes ester - containing drugs and scavenges cholinesterase inhibitors including potent organophosphorous nerve agents before they reach their synaptic targets. AChE hydrolyzes acetylcholine faster than other cholinesters and is much less active on butyrylcholine. BChE pereferentially acts on butyrylcholine but also hydrolyzes acetylcholine. AChE and BChE show three different enzymatic activities: esterase, aryl acylamidase and peptidase (or protease). AChE and BChE share 65% amino acid sequence homology and have similar molecular forms and active center structure despite being products of different genes on human chromosomes 7 (7q22) and 3 (3q26), respectively. The activity of cholinoesterases is inhibited by phosphoroorganic compounds, carbamates, phenoxyacetic pesticides and also hydrogen peroxide, aliphatic ketones and cholinomimetic drugs. Unfortunately, destructive processes that may even provoke death of neurons are also related to cholinoesterase activity. Cholinesterases play an important role in neurological diseases, leukemia, phenylketonuria, inflammatory processes, hyperlipidemia and osteoporosis.