Recent studies indicate that there is a strong correlation between a reduced functionality of AMPA receptors (2-amino-3-hydroxy-5-methylisoxazolepropionic acid) and memory and learning deficits. Studies on memory and cognition-enhancing drugs revealed that benzoylepiperidines and benzothiadiazines might exert their nootropic effects by facilitating α-amino-3-hydroxy-5-methylisoxazolepropionic acid (AMPA) mediated synaptic transmission through an inhibition of receptor desensitisation and/or by reducing receptor deactivation. In this way, facilitation of glutamatergic transmission promotes long-term potentiation, a type of synaptic plasticity hypothesized to be involved in the encoding of memory. However, their effects could also be related to a modulation of acetylcholine and noradrenaline release in different brain structures involved in learning and memory, as hippocampus and prefrontal cortex. Indeed, AMPA has been shown to stimulate acetylcholine and noradrenaline release.

The aim of the present study is to evaluate the influence of benzothiadiazines on central neurotransmitter in rats. The research will be performed by cerebral microdialysis technique followed by HPLC analysis. The cerebral microdialysis is a technique of perfusion in vivo that can track over time and in specific cerebral areas the levels of neurotransmitters and their metabolites. A cerebral microdialysis probe will be implanted in a selected of rat brain. Twenty four hours after the surgery animals are placed in a freely moving apparatus. The probe is perfused with ringer solution at constant flow. The probe has a very thin membrane trough which substances spread by their concentration gradient in the ringer solution and are collected in form of dialysate. The dialysates are collected at regular time intervals of time before and after benzothiadiazine administration. The samples will be analyzed with a