The term "epilepsy" comprises a group of neurological disorders, characterized by predisposition to transient cerebral dysfunction defined as epileptic seizure. Depending on the type of epilepsy, seizures can be manifested in different ways, however the most common is the presence of convulsions [1].

Epilepsy is characterized by a relatively high prevalence (approx. 1% of the world population) [2]. Despite the commercial availability of drugs with different mechanisms of action, still 20-40% of newly treated patients do not show long-term remission and many of them are diagnosed with drug-resistant epilepsy [3]. For this reason, searching for new antiepileptics constitutes a social need. The research on new mechanisms of action and undiscovered mechanisms of already available drugs seems to be particularly important.

Astrocytes are glial cells present in the central nervous system. Their importance in both physiological and patophysiological processes has become the subject of intense research in recent years. Among others, their role in generation and spread of seizures was proved [4]. Studies involving antiepileptics currently present on the market show their ability to modulate the function of astrocytes [5]. The obtained results brought interest to astrocytes as a potential target for new anticonvulsants.

The aim of presented project is chemical synthesis of 20 new compounds, the evaluation of their anticonvulsant activity in vivo and investigation of their properties in vitro. The work plan includes evaluation of compounds safety using cytotoxicity tests performed on human astrocytes cell line, as well as investigation of the influence of active compounds on cellular processes involved with the pathogenesis of epilepsy. Test compounds will belong to a group of piperazine and/or aminoalkanols derivatives and will be designed on the basis of the available literature and research results obtained in the Department of Bioorganic Chemistry (Jagiellonian University – Medical College in Cracow).

The results obtained in the project will contribute to increased knowledge about the role of astrocytic mechanisms in epilepsy and potential importance of astrocytic targets in anticonvulsant effect of piperazine and/or aminoalkanols derivatives.

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