

Epilepsy is the most common chronic neurological disease that affects around 1 % of the world population. It is a multifactorial disease, which is characterised by recurrent seizures. Present pharmacological treatment is symptomatic and approximately one third of the patients develop pharmacoresistant epilepsy. This bachelor thesis presents an overview of current knowledge about the modelling of epilepsy, while focusing on human in vitro models. Cell lines appear to be very promising in vitro models for modelling genetic epilepsies. For example, cell lines derived from human induced pluripotent stem cells or human neural stem cells, which both allow for introduction of potentially pathological mutations and further differentiation into many different cell types. Human in vitro models of epilepsy play important role in understanding the process of epileptogenesis, ictogenesis, mechanism of antiepileptic drugs effects and are used in the search for new active substances. Epilepsy comes with great burden of disease for the patients, that is why it is very important to research not only the molecular mechanisms of epileptogenesis, but also advancements of personalised therapy, which could give hope to many (even pharmacoresistant) patients.