

Abstract

Schizophrenia is a serious neuropsychiatric disorder characterised by abnormal behaviours, perception and thoughts. It is a neurodevelopmental disease of two types of factors – genetic predispositions and environmental factors. The exact cause of schizophrenia remains, however, elusive. Interneurons are types of neurons, mostly exerting inhibitory action and their dysfunctions are associated with pathogenesis of schizophrenia. They are essential in the generation of neuronal oscillations, which play an important role in cognitive functions. Disruption of these oscillations (especially gamma band) could be paralleled by negative, positive or cognitive symptoms of schizophrenia. These interactions could be possible discerned with an innovative technique called optogenetics. Optogenetics is a combination of genetic and optical approaches to controlling activity of specific targeted neurons. With this method we can study animal models of schizophrenia with great insight, which could give us an explanation of abnormalities in behaviour caused by neuronal disruption.

Keywords: schizophrenia; interneurons; animal models; neuronal oscillations; optogenetics