Throughout the last decades, one of the main findings in research on the brain mechanism of cognition is that some parts of the brain are specifically activated during the perception and processing of information related to the social world. This research has described so-called "social brain" which is engaged in the detection and perception of other people (for example human face or motion processing) and in recognition of their emotions or intentions. It has been also shown that related brain activity cannot be fully explained with regard to the processes of perception, attention or memory. The processing of social stimuli is also associated with changes in information flow between brain regions, especially in terms of connections with structures of social perception network. At the same time, numerous studies have revealed that patients with schizophrenia have problems with understanding behavior of other people and these deficits strongly affect their everyday functioning. Recently, it has been emphasized that problems in understanding emotions and intentions observed in patients with schizophrenia can be linked to an abnormal pattern of neural activity of a network associated with basic social perception. This project, which has been inspired by the previous studies on social information processing in schizophrenia, is aimed to explore the role of the activity of the neural structures involved in basic social perception in more complex processes associated with reading emotions and intentions of other people in patients with schizophrenia.

Two identically constructed tasks which will engage a wide range of abilities (recognition of gender or emotion, attribution of mental states to a person) will be presented to the participants during experimental procedures in this project. During the tasks, participants will observe actors either in animations representing their bodily movements with so called "point lights" or in photographs of faces displaying different emotions. During the first part of the project, the neural activity associated with each ability will be recorded with noninvasive brain imaging methods allowing either to create the spatial map of neural activity (functional magnetic resonance imaging; fMRI) or to capture the changes in the level of neural activity (electroencephalography; EEG). The use of both methods will allow for comparing brain mechanisms associated with different stages of social information processing in both groups.

In the second part of the project, the obtained information about the neural markers of social information processing in schizophrenia will be used to monitor the effects of the modulation of activity of the posterior superior temporal sulcus (*pSTS*). This structure, typically associated with basic social perception, will be stimulated with a noninvasive brain stimulation method (transcranial direct current stimulation; tDCS) in patients. Similarly to the first study, the participants will take part in two sessions, during which they will perform two tasks examining a variety of social cognitive abilities. Two types of stimulation will be used. One of the sessions will be preceded by the type of stimulation which should increase the action of the social information processing network, while another session will be preceded by the stimulation which should have no effects on the brain activity. The effects of both types of stimulation will be measured with the participants' accuracy in the experimental tasks, as well as with the EEG markers which will be selected on the basis of the results of the first study.

This project will provide a complex description of the mechanisms associated with deficient processing of social information in schizophrenia. The elucidation of brain mechanisms underlying the "social cognition" deficits in patients with schizophrenia is necessary for potentially creating the methods which would be effective in improving patients' functioning in this area. Due to the crucial role of "social cognitive" processes in a number of abilities fundamental for everyday functioning, the effects of the project may, in the long-term, improve the quality of life of patients with schizophrenia being one of the leading causes of disability in people under 45 years old.