

## **Abstract**

The neurodevelopmental model of schizophrenia incorporates genetic and environmental factors, which both play a role in the development of this disorder. For example the risk of developing schizophrenia is increased by prenatal stress in a sex-dependant manner. Fibroblast growth factor receptor 1 plays a role in neurodevelopmental abnormalities and has been found to influence cortical development, development of dopaminergic neurons and genes dysregulated in schizophrenia. Circadian, hypothalamic–pituitary–adrenal axis and sleep abnormalities are also common in schizophrenia patients and they might increase susceptibility to psychosis via dopaminergic system. The schizophrenia susceptibility gene *Disc1* has been found to play a role in sleep abnormalities and regulation of radial glia cell cycle. Cerebral organoids, which are generated by using human induced pluripotent stem cells, model human brain development and could be used for further studies of neurodevelopmental model of schizophrenia. Cerebral organoids could be improved in the future by vascularization and bioengineering methods.

**Key words:** cerebral organoids, schizophrenia, circadian rhythms, stress, FGFR1, DISC1, glucocorticoids