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Investigation of the influence of 5-HT1A R agonist and 5-HT2A/2C R agonist in m-RNA expression of AMPA-R GABA-Aα1 R and BDNF in HT-22 cells of mice using PCR and statistical technique

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Depression has a major effect on the prefrontal cortex and hippocampus. Several studies have showed that decreased serotonin levels in the brain plays a key role in depression. Most antidepressant medications aim towards enhancement of serotonin concentration in synaptic clefts. However, only 50% of the patients receiving the treatment responds and in the responding patients, although the rise in serotonin level is rapid, complete evasion of the depressive symptoms takes weeks to months. Ketamine, an N-methyl-D-aspartate (NMDA) receptor antagonist which leads to activation of α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptors (type of glutamate receptor) has a fast and sustained anti-depressive effect. So, research towards understanding the mechanism behind depression is also targeting the glutamatergic system. Clinical evidence demonstrated decreased levels of γ-aminobutyric acid (GABA) in plasma, cerebrospinal fluid (CSF) and brain of depressed patients. Brain Derived Neurotrophic factor (BDNF) has also been found to play a crucial role in the pathophysiology of depression. This study was designed to explore the association between serotonin and AMPA receptors, GABA-AR and BDNF respectively in reversing the biochemical changes already occurred due to depression. This experiment involves addition of 5-HT 1A agonist (8-OH DPAT) and 5-HT 2A/2C agonist (DOI) to cultured HT-22 cells and prefrontal cortex of rats and observing changes in m-RNA expression of AMPA receptors (GluR1, GluR2, GluR3 and GluR4), GABA-AR and BDNF receptors.

Biography

Adil Rasheed completed his PhD at the age of 28 years from the Swiss Federal Institute of Technology, Switzerland. He is currently working as a Senior Scientist and Research Manager of the Applied Mathematics group within SINTEF ICT located in Trondheim, Norway. His expertise is in the field of computational fluid dynamics, biostatistics, aviation safety and sustainable urban development.

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