

Delta-9-tetrahydrocannabinol (Δ^9 -THC) induce neurogenesis and improve cognitive performances of male Sprague Dawley rats

ABSTRACT

Neurogenesis is influenced by various external factors such as enriched environments. Some researchers had postulated that neurogenesis has contributed to the hippocampal learning and memory. This project was designed to observe the effect of Delta-9-tetrahydrocannabinol (Δ^9 -THC) in cognitive performance that influenced by the neurogenesis. Different doses of Δ^9 -THC were used for observing the neurogenesis mechanism occurs in the hippocampus of rats. The brains were stained with antibodies, namely BrdU, glial fibrillary acidic protein (GFAP), nestin, doublecortin (DCX) and class III β -tubulin (TuJ-1). The cognitive test was used novel-object discrimination test (NOD) while the proteins involved, DCX and brain-derived neurotrophic factor (BDNF), were measured. Throughout this study, Δ^9 -THC enhanced the markers involved in all stages of neurogenesis mechanism. Simultaneously, the cognitive behaviour of rat also showed improvement in learning and memory functions observed in behavioural test and molecular perspective. Administration of Δ^9 -THC was observed to enhance the neurogenesis in the brain, especially in hippocampus thus improved the cognitive function of rats.

Keyword: Delta-9-tetrahydrocannabinol; Hippocampal neurogenesis; Cognitive function; Novel-object discrimination test