UNIVERSITI TEKNOLOGI MARA

# NEUROPROTECTIVE EFFECT OF PIRACETAM AGAINST LPS-INDUCED NEUROINFLAMMATION USING EOC-20 CELLS: CELL VIABILITY

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## Table of Contents

# ABSTRACT

Alzheimer's disease (AD) is the most common form of dementia that mainly affects the memory and cognitive functions of the brain. Piracetam is one of a nootropic drug that acts as a memory enhancer and its mechanism of action is yet to be known. Piracetam is believed to improve the function of acetylcholine (ACh) as a neurotransmitter via muscarinic cholinergic receptor. The ACh is the one that is responsible for memory and cognitive functions of the brain. The neuroprotective effect of piracetam against neuroinflammation by LPS-induced was determined using EOC-20 cells in this study. The cytotoxicity study of LPS-induced cell showed that it caused tremendous reduction in cell viability. As with piracetam, it does not show any toxicity, but with a lower rate of reduction even at high concentration of piracetam tested. However, the results of the neuroprotective effect by piracetam on LPS-induced cell showed that it protected the cells from toxicity and enhanced the cell viability too. In conclusion, the piracetam exhibited the neuroprotective effect on the LPS-induced using EOC-20 cells.

# CHAPTER 1

# INTRODUCTION

## 1.1 Background of study

Dementia is a general term for the loss of memory and other intellectual abilities serious enough to interfere with daily life and Alzheimer's disease (AD) is one of the most common form of dementia (Bourgeois & Hickey, 2011). It is a disease of the brain that causes problems with memory, cognitive functions and also behavior that affecting daily activities of individuals ("Overview: Alzheimer's Association," 2014). It is not a normal part of aging process and the changes that take place in the brain begin at the microscopic level just before the sign of memory loss occurred (Alzheimer's Association, 2012).

Sabbagh, (2010) found that the process of transition from normal brain to AD brain, passes through an intermediate state called mild cognitive impairment (MCI). Further, this condition, as a transitional state between normal aging and AD, is one of the barometer risks for developing AD (Desikan et al., 2009). According to Sabbagh, (2010) also, there is almost 10 to 15 percent of all individuals diagnosed with MCI