

UNIVERSITI TEKNOLOGI MARA

**ANTIOXIDANT ACTIVITY STUDIES IN BRAIN OF
MALE BISPHENOL A TREATED *SPRAGUE*
DAWLEY RATS AT DIFFERENT DOSE RESPONSE**

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ABSTRACT

Bisphenol A (BPA) is one of the most important monomer used in the production of polycarbonated plastic food and beverage containers, resin lining of cans, dental sealants and many other common household products. BPA is an environmental endocrine disruptor, which exerts weak estrogenic properties. As we used many of the BPA related items, we are highly exposed to this chemical. As BPA can cross the blood brain barrier, it might exert some harmful effect towards the brain. BPA is also known to induce the formation of reactive oxygen species (ROS). Antioxidant is the natural defense mechanism that protects the cells from functional and structural damages caused by the reactive oxygen species (ROS). Therefore, this research is conducted to study the effects of different doses of BPA on the antioxidant activity in the brain by measuring one of the enzymes that is glutathione peroxidase (GPx). The result shown no significant difference of the GPx activities when exposed to the different doses of BPA ($p=0.526$). However, more studies may be needed before concluding that there is no effect of BPA on the antioxidant activities in the brain.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Bisphenol A (BPA) is a widespread chemical that is used in the production of polycarbonate, and epoxy resins lining food and beverage cans, dental sealants as well as many common household products (vom Saal and Myers, 2008). It is the base chemical or important monomer in the production of these products. Approximately six billion pounds per year of BPA for is used as the monomer to manufacture these products (Vandenberg *et al.*, 2007). BPA is a xenoestrogen, is known to exert a weak estrogenic activity (Roy *et al.*, 1997), and has been implicated as an environmental endocrine disrupter (Kabuto *et al.*, 2004).

Oxidative stress is a various harmful processes resulting from an imbalance between the excessive formation of reactive oxygen species (ROS) and limited antioxidant defenses (Turrens, 2003). Antioxidant enzymes are part of cellular protection mechanism against functional and structural damage caused by ROS (Halliwell, 1991). Antioxidant enzymes inside the body are called endogenous antioxidants, which comprises of superoxide dismutase (SOD), glutathione peroxidase (GPx) and catalase (Kabuto *et al.*, 2003). These enzymes contribute to the antioxidant defense system that scavenges free radicals and reactive oxygen species (Bindhumol *et al.*, 2003).