UNIVERSITI TEKNOLOGI MARA

GENE EXPRESSION CHANGES IN SEXUALLY DIMORPHIC BRAIN REGION OF DOSE RESPONSE, BISPHENOL A TREATED MALE SPRAGUE-DAWLEY RATS

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ABSTRACT

Bisphenol A (BPA) is one type of monomer that is widely used to manufacture polycarbonate plastic, resin lining of cans and others. The ester bond in the BPA-based polymers is so much prone to the hydrolysis, in which leaching of BPA has becoming accessible to human. BPA has been proven by many studies that it can bind weakly to both estrogen receptors; ER α and ER β, known also as xenoestrogen. The aim of this study is to observe gene expression changes of ERα and ERβ receptor in brain and any physical changes in body weight of the *Sprague-Dawley* rats after exposure to BPA through force-feeding. The rats are divided into 6 groups; the positive control group, negative control group, 50μg/kg/day group, 500μg/kg/day group, 1000μg/kg/day group and also 5000μg/kg/day group in which all are treated for 14 Days and weighted daily. The rats are sacrificed and the brain is taken and kept well in the -80^0C fridge. The primer for gene of interest is designed in appropriate to the gene of interest. RNA template is prepared and undergone the RT-PCR before the electrophoresis process. Based on the result of this study, it can be concluded that at lower doses, the body weight increases more ($p<0.05$) as compared to the higher doses. This study fails to obtain the band of the ERα and ERβ gene expression which can be due to many reasons and error such as the phenolic contamination of RNA sample, unsuitable PCR profiling and others. Many precaution steps such as proper regulation of the cleanliness and sterility of the working area can be taken to improve further study outcomes in the future.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Bisphenol A (BPA) is a compound that has two phenol group and is a difunctional building block of several important polymers and polymers additives (Vom Saal, 2008). It is prepared by the condensation of acetone with two equivalents of phenol (Constantin *et al.,* 1991). This reaction is catalyzed by an acid and usually excess of phenol is used to ensure proper reaction to occur.

Bisphenol A comes with the molecular formula of $C_{15}H_{16}O_2$ with 228.29 g mol^{-1} as its molar mass. Other names for BPA includes, 4,4'-(propan-2-ylidene)diphenol,p,p'-isopropylidenebisphenol, and also 4,4′-isopropylidenediphenol. The appearance of BPA seems to be in the form of white to light brown flakes or powder. There has been a high level of concerns towards the effects of BPA towards human health as there are many research are already into BPA.

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