UNIVERSITI TEKNOLOGI MARA

GENE EXPRESSION CHANGES IN FEMALE REPRODUCTIVE SYSTEM OF DOSE RESPONSE, BPA-TREATED *SPRAGUE-DAWLEY* RATS

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TABLE OF CONTENTS

	Page
TITLE PAGE	
APPROVAL	
ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS	iii
LIST OF TABLES	v
LIST OF FIGURES	vi
LIST OF ABBREVIATIONS	vii
ABSTRACT	ix
CHAPTER ONE (INTRODUCTION)	1
1.1 Background of the study	1
1.2 Significance of the study	1
1.3 Objectives	2
1.3.1 General objective	2
1.3.2 Specific objectives	2
1.4 Hypothesis	3
CHAPTER TWO (LITERATURE REVIEW)	4
2.1 Bisphenol A	4
2.1.1 Low dose BPA	6
2.1.2 Metabolism of BPA	7
2.1.3 Detection of BPA in humans	8
2.2 Effects of BPA	9
2.2.1 Effects on neuroendocrine system	10
2.2.2 Effects on ovary	11
2.2.3 Effects on uterus, vagina and mammary glands	12
2.3 Reproductive system	13
2.3.1 Estrogens	13
2.3.2 Progesterone	14
2.3.3 Xenoestrogens	15
2.4 *Sprague-Dawley* rats	16
CHAPTER 3 (MATERIALS AND METHODS)	18
3.1 Materials	18
3.1.1 Test chemicals	18
3.1.2 Animals	18
3.1.3 RNA extraction	18
3.1.4 RT-PCR	19
3.1.5 Gel electrophoresis	19
3.2 Experimental procedures	19
3.2.1 Treatment	19
3.2.2 Sacrifice and dissection	20
3.2.3 RNA isolation	20
3.2.4 Reverse Transcription-Polymerase Chain Reaction (RT-PCR)	22

ABSTRACT

Bisphenol A is a major monomer used in the production of epoxy resin and polycarbonate plastics worldwide. It has weak estrogenic activity and was claimed to have certain effects on reproductive system. This research was conducted to monitor physical changes and to identify gene expression changes of ERα, ERβ and PR in female reproductive system. The procedure in this study was started by force-feeding treatment of BPA according to group of 50μg, 500μg, 1000μg, 5000μg/ kg/ day, tween-80 as the negative control or ethynyl estradiol as the positive control, to six different groups of female juvenile SD rats with recorded daily weight. After 2 weeks of treatment, the rats were dissected and the weights of ovaries were documented. Then, RNA from ovaries was isolated using SV Total RNA Isolation System for RT-PCR before gel electrophoresis took place. The analysis of body and organ weights was performed using one-way ANOVA. Analysis of weight has been done and it is found that there is rising and elevated model of mean weight of other treatment groups as compared to the negative control. Meanwhile, relative ovary weight analysis shows no significant difference between groups of treatment. However, the main objective of the study in order to observe the changes in expression of genes of interest was not achieved due to some technical problems that might not be alert of during the procedures. Therefore, it is recommended for future study to be performed with sufficient precautions and suitable environment in order to minimize the risk of failure of the research.

CHAPTER 1

INTRODUCTION

1.1 Background to the study

Bisphenol A (BPA), an organic compound, is a major monomer used in the production of epoxy resin and polycarbonate plastics worldwide. It is produced through reaction of phenol and acetone with acid catalyst. The production has been said to increase by 5% to 6% each year (Ben-Jonathan & Steinmetz, 1998). Polycarbonate, which is composed of BPA monomers has many desirable commercial qualities such as transparency, mold ability and can withstand high impact thus are used to make variety of plastics materials and equipments of consumer products (Lazear, 1995). BPA comprises two phenolic rings that are joined together by a bridging carbon, which bear a resemblance to natural estrogen, 17-β-estradiol (Takamiya *et al.,* 2007) and also shares similarities in structure, metabolism and actions with a known human teratogen and carcinogen, Diethylstilbestrol (DES).

1.2 Significance of the study

Although it was claimed to be safe, there was a study stated that BPA has weak estrogenic activity and this property of BPA was discovered serendipitously by a scientists from Stanford University who were doing investigation on estrogen-