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MALE JUVENILE RATS GENE EXPRESSION IN SEXUALLY DIMORPHIC BRAIN REGION AFTER EXPOSURE TO BISPHENOL A (BPA)

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TABLE OF CONTENTS

ABSTRACT

In higher vertebrates, estrogen can exert an organizational effect on sexually dimorphic areas of the central nervous system (CNS) during postnatal phase of development. The possibility that estrogenic pollutants may mimic estrogen action on the CNS during development and produce long- lasting or irreversible effects is an issue of great concern. Bisphenol A (BPA), which is commonly ingested by humans, is one of the estrogenic pollutants. This study determined the potential effect of BPA 100 mg/kg/day in a model of male juvenile Sprague-Dawley rats. In order to evaluate this effect, the male juvenile Sprague-Dawley rats have been fed orally with BPA 100 mg/kg/day, in different periods of time which are 7 days, 14 days and 28 days. Ethinyl estradiol 10µg/kg bw was used as the positive control. The body weight and brain weight of male juvenile Sprague-Dawley rats, which were treated with BPA 100 mg/kg/day are increased drastically as the day of treatment increase, when compared to positive control. These findings showed that postnatal BPA exposure for a long period of time may alter the body weight and brain weight significantly.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

BPA is used in the manufacture of polycarbonate and epoxy resins from which a variety products are made, including reusable milk and food storage containers, baby formula bottles, the interior lining of food cans, and dental sealants and composites (Markey *et al.,* 2001b; Olea *et al.,* 1996). The degree to which BPA migrates from polycarbonate containers into liquid depends more on the temperature rather than the age of the container; more migration with higher temperature, and acidic or basic conditions (Le *et al.,* 2008). According to U.S Environmental Potency Agency (EPA), the actual BPA Lowest-Observed-Adverse-Effect-Level (LOAEL) is 50 mg/kg/day while the maximum safety dose is 50 μg/kg/day. BPA, which is an endocrine disruptor, has low acute toxicity, with an oral LD50 of 3250 mg/kg in rats (Okada *et al.,* 2008). Low doses of BPA can disrupt important effects of estrogen in the developing brain, causing brain damage. This type of disruption is associated with impaired of learning and memory (Al-Hisayat *et al.,* 2002).