UNIVERSITI TEKNOLOGI MARA

# INFLUENCE OF GENDER AND DIABETES ON ANTIOXIDANT ENZYME LEVELS IN THE AORTA OF WKY RATS

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# ABSTRACT

In present study, the gender differences in activities of key antioxidant in normoglycemic and diabetic rats were examined. SOD activities were significantly higher in normoglycemic female compared to male rats, while lower SOD activity was observed in diabetic female compared to male rats. Catalase activity was higher in normoglycemic female rats, as well as in diabetic female compared to male rats, which may be due to higher production of hydrogen peroxide in the former. These results suggest that diabetes reduces levels of SOD and removes the gender differences in levels of these enzymes in both genders.

# CHAPTER 1

# INTRODUCTION

## 1.1 Research background

Oxygen radicals include superoxide radical ($O_2^-$) hydroxyl radical ($OH^-$), which together with hydrogen peroxide ($H_2O_2$) and oxygen molecule ($O_2$) are jointly called reactive oxygen species (ROS). Oxidative stress is the condition where there are imbalance between levels of oxygen radicals and antioxidants. Oxygen radicals are produced endogenously under normal condition and the levels are increased under condition of oxidative stress. Oxygen radicals have well-established roles in the pathophysiology of cancer, aging, radiation injury and ischemia reperfusion injury (Knight, 1998).

There is growing evidence that diabetes is associated with vascular complications, which could be due to oxidative stress coupled to increased production of ROS (Laight *et al.*, 2000). Diabetes mellitus may be associated with increased lipid peroxidation which may contribute to long term tissue damage (Nourooz-Zadeh *et al.*, 1997). Gender may play important roles in development of cardiovascular disease as metabolic syndrome are found to be more prevalent in men than in women (Busserolles *et al.*, 2002). Epidemiological studies also demonstrated that pre-menopausal women appear to