

**UNIVERSITI TEKNOLOGI MARA**

**THE EFFECTS OF ESTROUS CYCLE ON  
REPRODUCTIVE HORMONE LEVEL**

**MASLIZA BT MD ALI**

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## TABLE OF CONTENTS

<i>Title page</i>	<i>Page</i>
APPROVAL FORM	
ACKNOWLEDGEMENT	ii
TABLE OF CONTENTS	iii
LIST OF FIGURES	vi
LIST OF TABLES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
CHAPTER ONE (INTRODUCTION)	
1.1 Research background	1
1.2 Effects of estrous cycle on biological function	2
1.2.1 Effect of estrogen on cardiovascular function	2
1.2.2 Effects of estrogen on cerebral nervous system (CNS)	3
1.2.3 Effects of estrogen on skeleton	3
1.3 Effect of estrous cycle on reproductive hormones	4
1.4 Rationale of chosen research	5
1.5 Aim and the main research objective	6

## ABSTARCT

Research work was aimed at improving vaginal smear technique for visualizing and recognizing cells types present during estrous cycle phase of female Wistar Kyoto rat (WKY) and to confirm that the reproductive hormones in those rats are influenced by phases of estrous cycle. Results showed staining with eosin and hematoxylin improved visual readability of cells compared to unstained smears. The length of estrous cycle in normal WKY rats was determined to be  $5.02 \pm 0.17$  days with duration for proestrus ( $1.08 \pm 0.04$  days), estrus ( $1.27 \pm 0.08$  days), metestrus ( $1.53 \pm 0.06$  days), and diestrus ( $1.12 \pm 0.06$  days). The proestrus/estrus phases significantly increased estradiol levels ( $326.78 \pm 100.00$  pg/ml) compared to metestrus/diestrus ( $137.22 \pm 38.42$  pg/ml). There were no differences in luteinizing hormone (LH) and progesterone levels between the proestrus/estrus and metestrus/diestrus stages.

# CHAPTER 1

## INTRODUCTION

### 1.1 Research background

The estrous cycle (EC) is a reproductive cycle of female rats and it is characterized by proestrus, estrus, metestrus (or diestrus I) and diestrus (or diestrus II) stages (Long and Evans, 1992; Freeman, 1988). Rats have a short length of EC which makes them suitable for investigating the impact of reproductive cycles on biological functions. Generally, a regular estrous cycle in rats last for about 4-6 days comprising of 1-2 days of estrus (Kim *et al.*, 2002). During estrous cycle, morphological changes occur in the epithelial cell lining of vagina. Cells change from nucleated forms present during proestrus to keratinized stages present in estrus (Hubert *et al.*, 2003). The proestrus phase is dominated by large numbers of nucleated epithelial cells with few leukocytes. The estrus phase smear consists mostly of cornified epithelial cells (non-nucleated) without leukocyte. There are some leukocyte cells with some cornified epithelial cells during the metestrus phase. In diestrus phase, the smear consists mainly of leukocyte, some epithelial cells, and mucus (Long and Evans., 1922; Mandl, 1951, Schedin *et al.*, 2000; Marcodes *et al.*, 2002).