

## THE EFFECT OF LIGHT/DARK CYCLE ON BLOOD FOLLICULAR BARRIER LAMININ EXPRESSION IN OVARY OF THE MICE

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**ABSTRACT :** Blood-follicle barrier (BFB) is found in the developing follicles of the ovary. The BFB permeability barrier of the endothelial cells in the microvessels that surround the developing follicle is constituted by the basement membrane of the developing follicle. It provides structural support, growth and maturation. The study aim is to known role laminin  $\alpha 1$  protein in development and maturation of blood follicular barrier in ovary of young adult female mice according to variation of dark / light cycle. A forty (40) adult healthy female mice (albino mice), aged about 12-14 weeks. These were divide into four groups according to daily illumination times (dark/light cycle). Each group have 10 female mice and were kept in special illuminating conditioned room. The group A animals were kept in normal diurnal variance, 10 hrs dark and 14 hrs light for period of one month. Group B animals were kept in room with full time light for period of one month. Group C animals were kept in room with full time of darkness for period of one month. Group D animals were kept in inverse state for normal diurnal variance (10 hr of full darkness during daylight and 14hr light during the night) for one month. Morphological appearance of histological examination by H&E reveals regress in size of ovary in dark group in comparison to light group. The follicles shows an increase in size & decrease in number of follicle ovary while the corpus luteum show increase in size and number in light group in comparison to other groups. While in reverse group, have normal value number of follicles and corpus luteum and size of ovary as in control group. This study concluded that light revealed an ovarian hyperovulation due to inhibitory effects on melatonin secretion, which will lead to stimulation of gonadotrophic hormones secretion from pituitary gland in contrast to hypo-ovulation condition of dark group mice. Immunohistochemical study reveals the light group animals they reveal a marked expression of laminin  $\alpha 1$  at BFB in comparison to other group animals and reveals very low value in dark group, which recorded. In reverse group animals, they reveal a weak expression of laminin  $\alpha 1$  than control in the BFB. Conclusion: laminins  $\alpha 1$  are an important and biologically active part in basal lamina of BFB, influencing cell adhesion, differentiation, migration and promotion of tissue survival.

**Key words :** Blood follicular, barrier laminin, light/dark cycle.

### INTRODUCTION

The blood-follicle barrier (BFB) is one of the blood-tissue barriers in mammalian body found in developing follicles of the ovary. The BFB permeability barrier of the endothelial cells in the micro vessels that surround the developing follicle is constituted and contributed significantly by the basement membrane of the developing follicle which alters its composition rapidly during follicle development (Michelle and Cheng, 2012).

Light/dark cycle is any biological process that displays an endogenous, entrainable oscillation of about 24 hours. These 24-hour rhythms are driven by a circadian clock, and they have been widely observed in plants, animals (Edgar, 2012). It impact on a wide range of physiological systems, which impact upon reproductive capacity (Kennaway *et al*, 2012).

Laminin protein is a family of large multi domain glycoproteins, which are major component of basement membrane and extracellular matrix (ECM). The laminins are an important and biologically active part of basal lamina, influencing cell adhesion, differentiation and migration (Aumailley *et al*, 2015).

In all mammals, the reproduction depends on the function of the hypothalamus-pituitary-gonads axis. In females, gonadotropin-releasing hormone (GnRH) neurons present in the septal area of hypothalamus send their axons to median eminence. GnRH is released from hypothalamus reaches the anterior pituitary where the gonadotrophs are stimulated to secrete follicle-stimulating hormone (FSH) & luteinizing hormone (LH). In the peripheral circulation, these hormones stimulate specific cells (granulosa cells) in the ovary leading to ovulation