PhD Proposal Presentation

Name of the student: Ms. Samia Palat Tharayil

Research Guide: Dr. Kushaan Khambata

Division: Department of Gamete Immunobiology

Title of Project: Investigating role of prolactin as an epigenetic regulator of male fertility

Date, Venue and Time of presentation: 15th October 2025, Dr. Shantarao Auditorium at 10:30 am

Abstract

Prolactin (PRL) is a polypeptide released by lactotrophic cells in the pituitary gland. It is regulated by another hypothalamic hormone, dopamine, which inhibits its secretion. Although PRL has well-established roles in lactation and female reproduction, there are very few studies investigating its role in male reproduction. Prolactin receptor is present on the male germ cells as well as Leydig cells, indicating that PRL can directly act on the developing germ cells and regulate spermatogenesis. Elevated as well as low levels of PRL have been associated with poor sperm parameters and infertility, indicating that PRL functions within an optimal physiological range to sustain spermatogenesis. Our previous studies demonstrated that both hypo- as well as hyperprolactinemia in adult rats resulted in sub-fertility and reduced sperm parameters, further reinforcing the importance of optimal PRL for male fertility. However, the mechanisms by which PRL exerts its effects on fertility remain unknown. Interestingly, PRL is known to regulate epigenetic mechanisms in other pathological conditions such as breast cancer and systemic lupus erythematosus (SLE). Therefore, this study aims to elucidate the epigenetic mechanisms through which PRL regulates male fertility by investigating epigenetic modifications such as DNA methylation and histone modifications in the hypo- and hyperprolactinemia rat models showing sub-fertility. These findings will reveal how prolactin regulates epigenetic mechanisms during spermatogenesis and in male fertility. Detailed study plan and objectives will be presented.