DETERMINATION OF ALLELIC EXPRESSION OF H19 IN
PRE- AND PERI-IMPLANTATION MOUSE EMBRYOS

Verónica M. Negrón Pérez

Dr. Rocío M. Rivera, Thesis Supervisor

ABSTRACT

H19 is a maternally-expressed imprinted non-coding RNA with tumor suppressor activity. H19 is located in an imprinted cluster which contains the paternally-expressed fetal growth factor Igf2. Monoallelic expression of H19 and Igf2 is regulated by allele-specific interaction of shared enhancers. Previous work has shown that embryo culture can result in biallelic expression of H19. However, preliminary data in our laboratory suggest that biallelic expression of H19 is a normally-occurring event during peri-implantation in the mouse. To test this, the allelic expression of H19 was compared between in vitro- and in vivo-developed embryos at 84, 96, and 108 hours following ovulation. We found that as embryos advance through preimplantation development they start expressing H19 in a biallelic manner regardless of treatment. In a subsequent study, we microdissected peri-implantation embryos into two halves, one containing the inner cell mass (ICM) and the other containing the primary trophoblast giant cells (PTGC). PTGCs are invasive embryonic cells that initiate uterine implantation. The PTGC-containing half of the embryo had greater expression of H19 and less Igf2 than the ICM-containing half of the embryo. We speculate that biallelic expression of H19 is part of a normal physiologic event in peri-implantation mouse embryos to reduce Igf2 levels in the PTGCs in order to control their invasive behavior.