

## **The Role of Interferon Induced Transmembrane Protein (IFITM) -1 in Mouse Uterus during Estrus Cycle and Pregnancy**

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Interferon-induced transmembrane protein-1 (IFITM, Frangilis, Mil-2) are implicated to have roles in germ cell development and genital ridge migration during embryo development. We have cloned this gene from cDNA library of mouse 9.5 dpc genital ridge, and identified the specific roles in mouse uterus during estrus cycle and pregnancy. Our cloned mil-2 gene have two naturally occurred point mutation that Isoleucine 37Valine and Isoleucine54Valine comparing to Mil-2 gene in gene bank database. Northern hybridization data reveals that this gene are only expressed in lung and un-pregnant uterus. Cellular localization of Mil-2 gene was identified using a GFP-Mil2 fusion gene, that GFP-Mil2 fusion proteins were strongly expressed in intracellular compartment instead of cell membrane. Confocal microscopy assay also clearly support that Mil-2 is expressed in nuclear membrane. Based on our northern hybridization data, we hypothesized that Mil-2 gene play an important role in mouse uterus during estrus cycle and pregnancy. Real time RT-PCR data showed that Mil-2 gene expressions were rapidly increased in proestrus and estrus stages, whereas the expressions were decreased in metestrus and diestrus stages. During pregnancy, Mil-2 gene expression were increased on 1~2 dpc, but dramatically decreased after 2 dpc. It was predominantly increased on 6dpc~7dpc. Subsequently it decreased and this low level expression were maintained until 14 dpc. These results suggest that Mil-2 gene may strongly relate to physiological control of uterus during estrus cycle and pregnancy, that its high level expression may facilitate the implantation of embryo, whereas its low level expression may contribute the maintenance of pregnancy.