P-24

Analysis of Protein Expression Pattern in the Placentomegaly Derived from Embryonic Stem (ES) Cell Nuclear Transfer in Mouse

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To assess the protein expression pattern in the placentomegaly of cloned mouse derived from ES cell nuclear transfer, we have used the global proteomics approach by 2-D gel electrophoresis (2-DE) and MALDI-TOF-MS. The differential protein patterns of 3 placentae from cloned mice derived from nuclear transfer of ES cell and 4 normal mice placentae were analyzed. In the comparison of normal and NT placenta, a total of 47 spots were identified as differentially expressed proteins, of which 28 spots were up-regulated in NT placenta, while 19 spots were down-regulated. One of up-regulated proteins in cloned mouse placenta was identified as TIMP-2 protein that is related to extracellular matrix degradation and tissue remodeling processes. And one of down-regulated protein in NT placenta was identified as PBEF protein that is related to inhibition of apoptosis and induction of spontaneous labor. To ensure the identified protein was truly up- and down-regulated in placentomegaly, Western blotting was performed. Indeed, Western blot analysis revealed a significant increase of TIMP-2 protein level in NT placenta compared with normal. In addition, the expression levels of PBEF in placentomegaly appeared to be markedly lower than normal placenta. In addition, the level of DNA methylation of TIMP-2 gene's promoter locus in placentomegaly cells are being investigated to confirm whether discrepancy of epigenetic programming in nuclear transfer causes abnormal gene expression.

Key words) *Placentomegaly, ES cell NT, 2-gel-electrophorsis, MALDI-TOF-MS, TIMP-2, PBEF, Methylation*