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Comparative study of protein profile in cloned and normal mouse placenta

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Low success rate of somatic cell nuclear transfer (SCNT) has hindered the development of animal cloning application. To address whether placental dysfunction in SCNT causes fetal abnormality during pregnancy, we have used global proteomics approach by 2-D gel electrophoresis (2DE) and mass spectrometry to analyze the differential protein patterns from the 3 placentas of neonatal cloned mice derived SCNT and 4 normal mice placentae. Proteins within isoelectric point range of 4.0~7.0, 6.0~9.0, 7~11 and 5.5~6.7 separately were analyzed in 2DE with 3 replications of each sample. A total of approximately 3500 spots were detected in placental 2-D gel stained with Coomassie-blue. In the comparison of normal and SCNT samples, a total of 47 spots were identified as differentially expressed proteins, of which 28 spots were up-regulated proteins such as TIMP-2 and esterase 10, while 19 spots were down-regulated proteins such as Pre-B-cell colony-enhancing factor 1(PBEF), annexin A1. Most identified proteins in this analysis appeared to be related with catabolism, cell growth, metabolism, regulation, cell protection, protein repair or protection. Western blot analysis confirmed a decrease level of PBEF and increase level of TIMP-2 in SCNT mouse placenta compared to normal. Our results revealed composite profiles of key proteins involved in abnormal mouse placenta derived from SCNT.

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