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by

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## ***Identification of porcine genes in term placenta affected by nuclear transfer and cloning of pigs***

### **ABSTRACT**

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Lack of parturition and lactation in gilts (as well as other species) gestating nuclear transfer (NT) derived fetuses has been previously described. During gestation, the placenta serves as the interface of chemical exchange of nutrients and possibly other molecular signals for critical communication between the mother and the fetus such as signaling for pre-birth parturition and lactation. In this study, transcriptional profiling was performed to determine the genes responding to NT, as a first step in understanding the NT effect on parturition/lactation. Profiling included using a novel Affymetrix GeneChip® Porcine Genome Array containing 23,937 probe sets, which represents 20,201 genes and 190 controls, to interrogate placenta samples from nine pigs, including three GFP transgenic nuclear transferred male pigs, three normal male pigs, and three normal female pigs. Total RNA was hybridized to individual GeneChips. Data from cell files were converted to gene signal files by GCOS1.2. Natural log was taken for all the raw gene signals for normalization. A boxplot analysis in R2.0.1 software showed uniformity of data from all nine chips. GLM procedure in SAS was used to analyze differentially expressed genes between nuclear transferred male and normal male placentas, and between normal male and female placentas. A total of 1,696 genes showed significant differential expression at  $p < 0.05$  level (FDR=0.39) between nuclear transferred and normal pig placenta RNAs. Among the genes significantly differentially expressed between NT and normal placentae were 16 genes that are important for initiation of parturition including phospholipase A2 group XII, PGE synthase, prostaglandin endoperoxidase synthase, and oxytocin receptor gene. Subsequently, gene expression levels will be confirmed by qPCR for selected members of these pathways as a first step in hypothesis generation.