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Identification of Differential Expressed Genes at 2-cell Stage Porcine Embryo using ACP-based DD-RT-PCR

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Successful embryonic development is dependant on temporal and stage-specific expression of appropriate genes. However, information on specific gene expression during early cleavage before zygotic gene activation (ZGA) is lacking. In the present study, we compared gene expression between porcine parthenotes 2-cell and blastocyst embryos to identify the genes that are specifically or prominently expressed by employing annealing control primers (ACP)-based GeneFishing PCR. Using 60 ACPs, we identified and sequenced 9 of these differentially expressed genes (DEGs). The cloned genes or ESTs (GDI-2, MTMR3, MKLN1, NUP88, ePAD, CIRHIM, UPF3B, ITGA2, and CGI-140) all exhibited significant sequence similarity with known genes (78%~95%) of other species in GenBank. As revealed by real time RT-PCR, these genes were regulated upstream in metaphase II, 1-cell, and 2-cell stage embryos during early pre-implantation. Also, in mouse embryo, these genes were up-regulated in metaphase II, 1-cell stage embryos before ZGA, reproductively. Further analysis of the differentially expressed genes we have identified will provide the resource for research in mammalian reproduction, e.g., for early cleavage, and activation of the embryonic genome.

Key words: *2-cell embryo, Differential expressed genes, ACP*