Human parthenogenetic stem cells

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Human parthenogenetic embryonic stem cells (pESCs) were previously thought to be better cell sources for ESC banking because the homozygous Human Leukocyte Antigen (HLA) would strongly increase the matching degree for certain population with relatively smaller cohorts of cell lines. While recent studies have shown that upon currently used strategy to artificial activate oocyte without second polar body extrusion, most pESCs derived would be predominantly heterozygous due to early recombination events in oocyte. Here we reported successful derivation of human homozygous and heterozygous pESC lines from one pronuclear zygote following routine *in vitro* fertilization treatment and artificial parthenoactivation. The hESC characters, SNPs genotyping, gene expression profiles were conducted and compared to other normal hESCs. The *in vitro* differentiation ability and the epigenetic stability of imprinted genes of these two cell lines before and post differentiation were further evaluated.

Keywords: parthenogenesis, hESCs, homozygosity, heterozygosity, differentiation, imprinted genes

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Guangxiu Lu, MD, Prof Lu's research focuses on stem cells and reproductive medicine, Professor Lu is one of the pioneers in the field of ART. Many 'China Firsts' were appeared in her lab, such as the first human frozen sperm bank, the first baby born with frozen semem and the first test tube baby born with donated embryo. She applied these reproductive

techniques to treating of infertile couples and made her lab one of the leading reproductive and genetic medical centres in China. Moreover, she made great progress in stem cell research. Prof Lu is the director of National Research & Engineering center of Human Stem Cell. She is current Professor and the director of the Institute of Reproductive & Stem Cell Engineering of Central South University, and the president of CITIC-Xiangya Reproduction & Genetic Hospital.