Pig Chimeric Model with Human Pluripotent Stem Cells

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Abstract

Interspecies chimera formation provides a unique platform for studying donor cell developmental potential, modeling disease in vivo, as well as in vivo production of tissues and organs. The derivation of human pluripotent stem cells (hPSC) from either human embryos or somatic cell reprogramming facilitates our understanding of human development, as well as accelerates our exploration of regenerative medicine for human health. Due to similar organ size, close anatomy, and physiology between pig and human, human-Pig interspecies chimeric model in which pig serves as the host species may open new avenues for studying human embryogenesis, disease pathogenesis, and generation of human organ for transplantation to solve the worldwide donor organ shortage. Our previous study demonstrated chimeric competency of different types of human PSCs in pig host. In this chapter, we introduce our workflow for the generation of human PSCs and analysis of its chimeric contribution to pre- and postimplantation pig embryos.

Keywords: Blastocyst; Chimeric contribution; Epiblast stem cells (EpiSCs); Human embryonic stem cells (hESCs); Human induced pluripotent stem cells (hiPSCs); Human pluripotent stem cells (hPSCs); Pig.

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