

The Comparison between bFGF and Small Molecules in Derivation of Chicken Primordial Germ Cells and Embryonic Germ Cells

Authors : Maryam Farzaneh, Seyyedeh Nafiseh Hassani, Hossein Baharvand

Abstract : Objective: Chicken gonadal tissue has a two population such primordial germ cells (PGCs) and stromal cells (somatic cells). PGCs and embryonic germ cells (EGCs) that is a pluripotent type of PGCs in long-term culture are suitable sources for the production of chicken pluripotent stem cell lines, transgenic birds, vaccine and recombinant protein production. In general, the effect of growth factors such bFGF and mouse LIF on derivation of PGCs in vitro are important and in this study we could see the unique effect of small molecules such PD032 and SB43 as a chemical, in comparison to growth factors. Materials and Methods: After incubation of fertilized chicken egg up to 6 days and isolation of primary gonadal tissues and culture of mixed cells like PGCs and stromal cells. PGCs proliferate in the present of fetal calf serum (FCS) and small molecules and in another group bFGF, that these factors are important for PGCs culture and derivation. Somatic cells produce a multilayer feeder under the PGCs in primary culture and PGCs make a small cluster under these cells. Results: In present of small molecules and high volume of FCS (15%), the present of EGCs as a pluripotent stem cells were clear four weeks, that they had a positive immune-staining and periodic acid-Schiff staining (PAS), but in present of growth factors like bFGF without any chemicals, the present of PGCs were clear but after 7 until 10 days, there were disappear. Conclusion: Until now we have seen many researches about derivation and maintenance of chicken PGCs, in the hope of understanding the mechanisms that occur during germline development and production of a therapeutic product by transgenic birds. There are still many unknowns in this area and this project will try to have efficient conditions for identification of suitable culture medium for long-term culture of PGCs in vitro without serum and feeder cells.

Keywords : chicken gonadal primordial germ cells, pluripotent stem cells, growth factors, small molecules, transgenic birds

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