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P39 Identification of rabbit microRNA expression profile in rabbit embryos and stem cells

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Human ESCs are potential sources for regenerative medicine, cell-based transplantation, disease pathology and drug discovery. By generation of iPSCs from human somatic cells, it was expected to overcome the ethical controversy associated with human ESCs research and avoid immunogenic responses by iPSCs treatment. To overcome the limitations associated with human ESCs, many efforts have been put to generate the stable animal ESC and iPSC lines. Mouse and human ESCs share similarities in expressing markers of the pluripotent state; however, they have fundamental differences in colony morphologies, growth requirements and biochemical characteristics, which restrict the use of, mouse ESCs in regenerative medicine. The rabbit ESCs represent an alternative animal model to study human diseases since rabbit ESCs resemble primate ESCs more closely than mouse ESCs. Several groups have reported the establishment of rabbit ESCs, but rabbit pluripotent stem cells were defined as EpiSC-type or primed state stem cells; these are rarely competent to contribute to blastocyst chimeras and are therefore developmentally and functionally distinct from naive state mouse ES cells. Chimera system aims to determine the ES/iPS cell capacity to contribute to the early steps of rabbit embryo development. Such contribution is essential for the generation of germ line chimeras. If we could get germ cell chimeras, we could create animal models for human diseases.

The murine ESCs representing the "Naïve" state, predominantly express the miR-290 cluster, whereas human ESCs and EpiSCs representing "Primed" state, display predominant expression level of the miR-302 cluster. As we conclude in our previous work, high expression level of ocu-miR-302 cluster compared to low expression level of ocu-miR-290 cluster in rabbit pluripotent stem cells might reflect their primed state. Recently we could identified the expression pattern related to naïve state of stem cells using our specific rabbit miRNA array, which contains the most important pluripotency specific miRNAs. We could identify some target sites of stem cell specific miRNAs in rabbit genome. In the future we plan to perform in situ hybridization experiment on rabbit embryos for most important miRNAs and for that embryonic stem cell specific factors, which are the targets of these embryonic stem cell specific miRNAs. We aimed to determine the inner cell mass, trophectoderm, trophoblast, embryoblast and hypoblast specific miRNAs and its target in preimplantation rabbit embryos.

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