

Formation of chicken interspecies chimaera for human pluripotent stem cell research

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The use of human volunteers in stem cell research has raised many ethical questions. Hence, researchers have switched to animals for conducting experiments. However, the genome of animals is different to that of humans. Therefore, animals are genetically modified to aid in in vivo testing of human pluripotent stem cells (hPSCs) and related experiments. Humanised mice are an example of the same and are commonly used in these studies. However, mice do not serve as an appropriate model for every type of experiment. This has raised a need for chimeric species in studies related to human biology. Thus, avian chimaeras are being studied for this purpose. Chimaera is an animal that shows more than one genotype characteristic feature. In domestic avian species, chickens are selected for chimerism. A group of researchers from the University of Science and Culture in Iran tried forming chicken interspecies chimaera. Their studies found that naïve-like and primed hPSCs contributed to chimaera formation when human stem cells were injected into the blastula stage of chick embryos. Out of 89.3% of chimaeras formed, 40% showed viability for 6 days. The maximum accuracy of this study is very low due to which there is a lack of appropriate chimaeric species for research related to human biology. Hence, further studies are required to overcome the limitations and effectively implement this chimaeric system.

Keywords: Chimaera, Human pluripotent stem cells, Chick embryo, Naïve hPSCs, Primed hPSCs

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