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Brief Report

iPS Cells Can Support Full-Term Development of Tetraploid Blastocyst-Complemented Embryos

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Summary

To our knowledge, for the first time, we demonstrate that induced pluripotent stem cells (iPSCs) can autonomously generate full-term mice via tetraploid blastocysts complementation. Differentiated somatic cells can be reprogrammed into iPSCs by forced expression of four transcription factors—Oct4, Sox2, Klf4, and c-Myc. However, it has been unclear whether reprogrammed iPSCs are fully pluripotent, resembling normal embryonic stem cells (ESCs), as no iPSC lines have shown the ability to autonomously generate full-term mice after injection into tetraploid blastocysts. Here we provide evidence demonstrating that an iPSC line induced by the four transcription factors can be used to generate full-term mice from complemented tetraploid blastocysts and thus appears to be fully pluripotent. This work serves as a proof of principle that iPSCs can in fact generate full-term embryos by tetraploid complementation.