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We have shown that pluripotent stem cells can be generated from mouse embryonic fibroblasts (MEF) and adult mouse tail tip fibroblasts by the retrovirus-mediated transfection of four transcription factors, namely Oct3/4, Sox2, c-Myc, and Klf4. We designated these cells as iPS (induced pluripotent stem) cells. Mouse iPS cells are indistinguishable from ES cells in morphology, proliferation, gene expression and teratoma formation. Furthermore, when transplanted into blastocysts, mouse iPS cells derived from MEF can give rise to adult chimeras, which are competent for germline transmission. These results are proof-of-principle that pluripotent stem cells can be generated from somatic cells by the combination of a small number of factors.

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