Nuclear Reprogramming in Cells

[redacted] · [redacted] · [redacted]

[redacted]

2 AUTHORS, INCLUDING:

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[redacted] PUBLICATIONS · [redacted] CITATIONS

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Nuclear Reprogramming in Cells

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Nuclear Transfer to Eggs and Oocytes

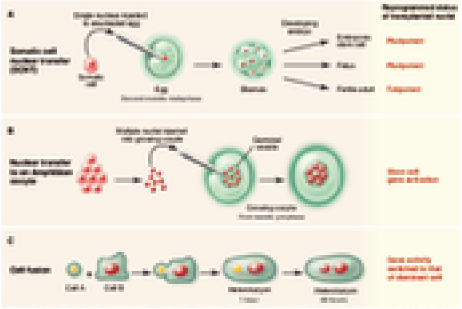
[illegible]

Efficiency

[illegible]

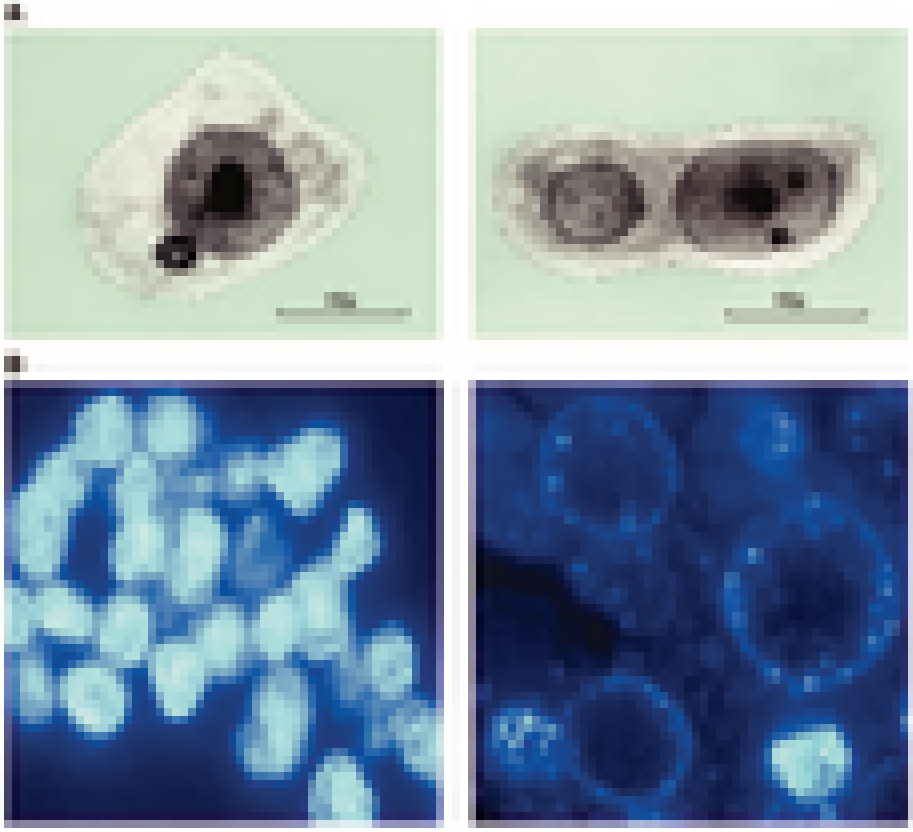
Mechanism

[illegible]



Cell Fusion and Cell Extracts

[illegible]



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Induced Pluripotency

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Lineage Switching

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[illegible]

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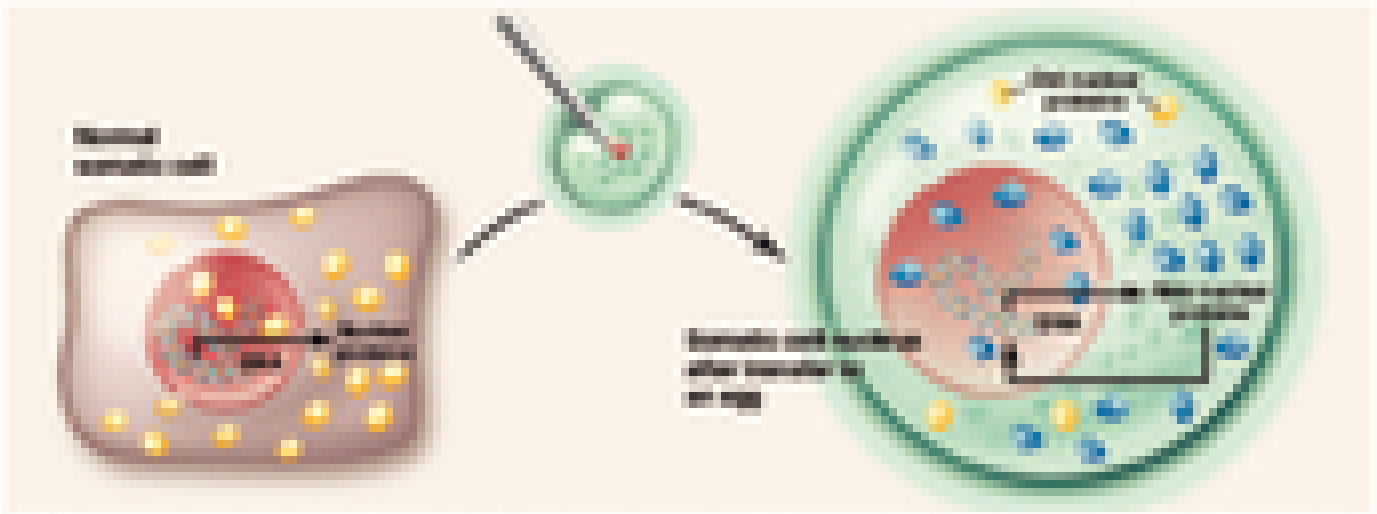

Fig. 4 Somatic cell nuclear reprogramming by oocytes or ES cells. After nuclear transfer to an oocyte (**right**), inactive somatic cell nucleus proteins and methylated genes reprogram. Most inactive eggs do not express pluripotency factors (such as Oct4) that induce new gene expression.

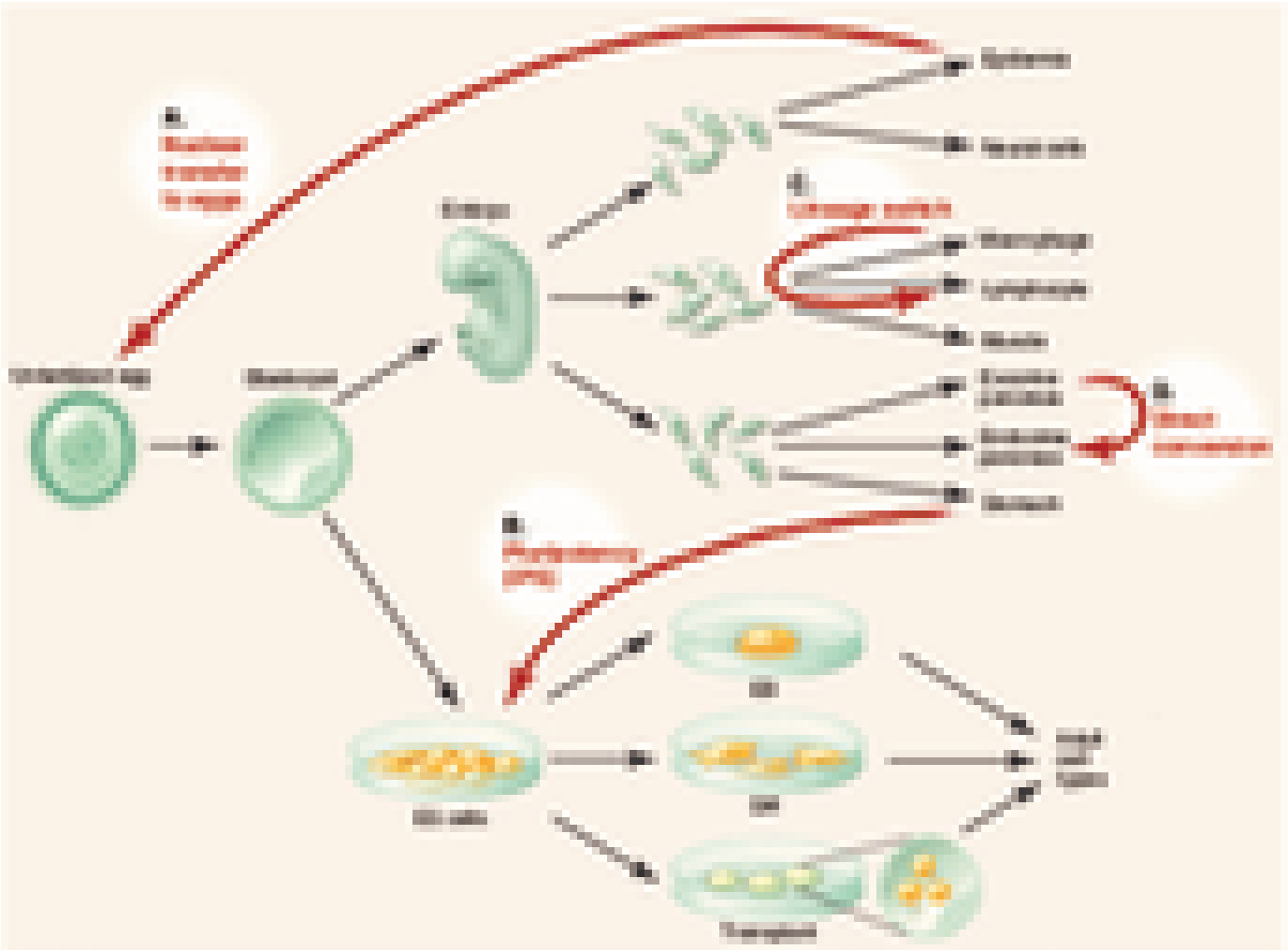

Fig. 5 Four experimental routes for nuclear reprogramming. Most cell-based reprogramming experiments (**A**–**C**) use mouse cells. Nuclear transfer (**A**) to oocytes (eggs) can reprogram differentiated cells to pluripotency. Cell fusion (**B**) of differentiated cells with ES cells can induce pluripotency. Direct reprogramming (**C**) by forced expression of transcription factors can convert one differentiated cell type into another without passing through a pluripotent state. Reprogramming by nuclear transfer to eggs (**A**) or cell fusion (**B**) can also correct genetic defects in human cells. Some cells (for example, blood cells) can be reprogrammed directly (**C**) to pluripotency by forced expression of transcription factors (Oct4, Sox2, Klf4 and c-Myc). Pluripotent cells can be induced to differentiate in culture (**D**), or transplanted to a blastocyst to create mice with cells derived from ES cells (**E**). Direct conversion (**C**) can also convert one differentiated cell type into another (**F**). Nuclear transfer to oocytes can create ES cells from patients with genetic diseases (**G**). Nuclear transfer to eggs can also create cloned animals (**H**). Cell fusion (**B**) can induce pluripotency in human cells (**I**). Direct reprogramming (**C**) can create induced neurons (iN cells) from fibroblasts (**J**). Nuclear transfer to eggs can create cloned animals (**K**). Cell fusion (**B**) can induce pluripotency in human cells (**L**). Direct reprogramming (**C**) can create induced neurons (iN cells) from fibroblasts (**M**).

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The Future

[illegible]

References and Notes

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