addgene

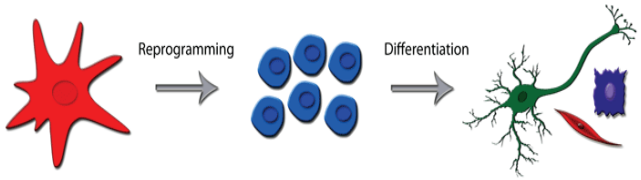
A better way to share plasmids

Stem Cell Plasmids

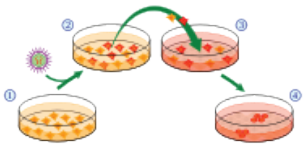
Stem cells are proliferative, largely unspecialized cells, with the remarkable potential to develop into many different cell types in the body during development. Each new cell has the potential either to remain a stem cell or become another cell type with a more specialized function. Scientists have developed methods to return fully-differentiated adult somatic cells to a pluripotent state, referred to as induced pluripotent stem cells (iPSCs) via "reprogramming." These iPSCs, much like their embryonic stem cell cousins, can give rise to an entire adult organism. Additionally, they can be directly differentiated into specific somatic stem cells or fully differentiated cell types.

Addgene has assembled a collection of plasmids for reprogramming somatic cells into iPSCs and plasmids for direct differentiation and transdifferentiation.

Plasmids for Reprogramming Somatic Cells into iPS cells:



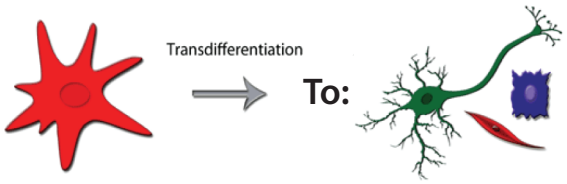
Lentiviral, retroviral, adenoviral, episomal, and non-viral plasmids for:



human: NANOG, SOX2, OCT4, LIN28, etc.

mouse: Oct4, Sox4, Klf4, cMyc, etc.

Plasmids for Direct Differentiation and Transdifferentiation:



iPSC	→	Cardiomyocyte
Fibroblast	→	Neuronal cell types, hepatocytes, myocytes, and Sertoli cells
Pancreatic Exocrine	→	Beta-cell

Reporters:

Promoter Reporters:

- Nanog5P reporter
- phOCT4-Luc
- c-myc promoter (4xTBE1 wt)

Activity Reporters:

- pBV-Luc wt MBS 1-4 (for c-Myc)

Differentiation Reporters:

- For MyoD, HB9, Ngn3, Pdx1

Find Plasmids from:

- Shinya Yamanaka
- George Daley
- Rudolf Jaenisch
- Konrad Hochedlinger
- and many more!

www.addgene.org/StemCell

Addgene is a non-profit plasmid repository that stores, archives, and distributes plasmids to academic scientists around the world.

For questions about plasmids, shipping, or ordering, please contact help@addgene.org.

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Addgene's Stem Cell Collection

Plasmids Used in Reprogramming Somatic Cells into iPS Cells -

Delivery Method	Species	Description	Sample Plasmid	Depositing Scientist
Retrovirus	Human	Retroviral expression of human cMYC	pMXs-hc-MYC (#17220)	**Shinya Yamanaka,** *Kyoto University, Center for iPS Cell Research and Application*
	Mouse	Retroviral expression of mouse Brahma related gene 1 (Smarca4)	pMX-Brg1 (#25855)	**Hans Schöler,** *Max Planck Institute for Molecular Biomedicine*
miR-Retrovirus	Mouse	Mammalian Expression of miR-302b-367	pMXs-MC (#31704)	**Duanqing Pei,** *Chinese Academy of Science*
Lentivirus	Human	Lentiviral EOS reporter with Oct3/4 enhancer (x3), expresses EGFP and Puro resistance	PL-SIN-EOS-C(3+)-EiP (#21313)	**James Ellis,** *Hospital for Sick Children*
	Mouse	Lentiviral plasmid expressing mouse Oct4, Sox2, Klf4 and cMyc for iPS cell generation	FUW-OSKM (#20328)	**Rudolf Jaenisch,** *Whitehead Institute for Biomedical Research*
Adenovirus	Mouse	Adenoviral Expression of mouse Oct4	pAd-Oct4 (#19768)	Konrad Hochedlinger, *Johns Hopkins University and School of Medicine*
Episomal	Human	used in the derivation of human iPS cells using non-integrating episomal vectors; expresses Oct4 and Sox2; Nanog and Klf4	pEP4 E02S EN2K (#20925)	**James Thomson,** *University of Wisconsin, Madison*
	Mouse	5 reprogramming factors (OCT4, SOX2, KLF4, c-MYC and LIN28) are expressed as a single poly-cistronic unit	pEB-C5 (#28213)	Linzhao Cheng, *Johns Hopkins University and School of Medicine*
non-viral for in-vitro translation	Human	Human KLF4 expression, insert 5'UTR-KLF4-3'UTR	pcDNA3.3_KLF4 (#26815)	Derrick Rossi, *Boston Children's Hospital*
non-viral	Mouse	myelocytomatosis oncogene-F2A-Kruppel-like factor 4-T2A-POU domain, class 5, transcription factor 1-E2A-SRY-box containing gene	pCAGMKOSiE (#20865)	**Keisuke Kaji,** *MRC Centre for Regenerative Medicine*

Direct Differentiation and Transdifferentiation Plasmids:

From → To Cell Types	Delivery Method	Species	Vector	Depositing Scientist
iPSC → Cardiomyocyte	Lentiviral	Human	pSin	**Sean Palecek,** *Harvard Medical School*
Fibroblast → Neuron	Lentiviral	Mouse	Tet-O-FUW	**Marius Wernig,** *University of Wisconsin, Madison*
Fibroblast → Neuron	Lentiviral	Human	pTLemiR	**Jerry Crabtree,** *Stanford University*
Fibroblast → Dopaminergic Neuron	Lentiviral	Human	pCCL	**Malin Parmar,** *Lund University*
Fibroblast → Motor Neuron	Retroviral	Human/Mouse	pMXs	**Kevin Eggan,** *Harvard University*
Fibroblast → Hepatocyte	Retroviral	Mouse	pGCDNsam	**Atsushi Suzuki,** *Kyushu University*
Pancreatic Exocrine → Beta-Cell	Adenoviral	Mouse	pAd	**Douglas Melton,** *Harvard University*
Fibroblast → Sertoli Cell	Lentiviral	Mouse	FUW-tetO	**Rudolf Jaenisch,** *Whitehead Institute for Biomedical Research*
Fibroblast → Myocytes	non-viral	Mouse	pCSA	**Andrew Lassar,** *Harvard Medical School*

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