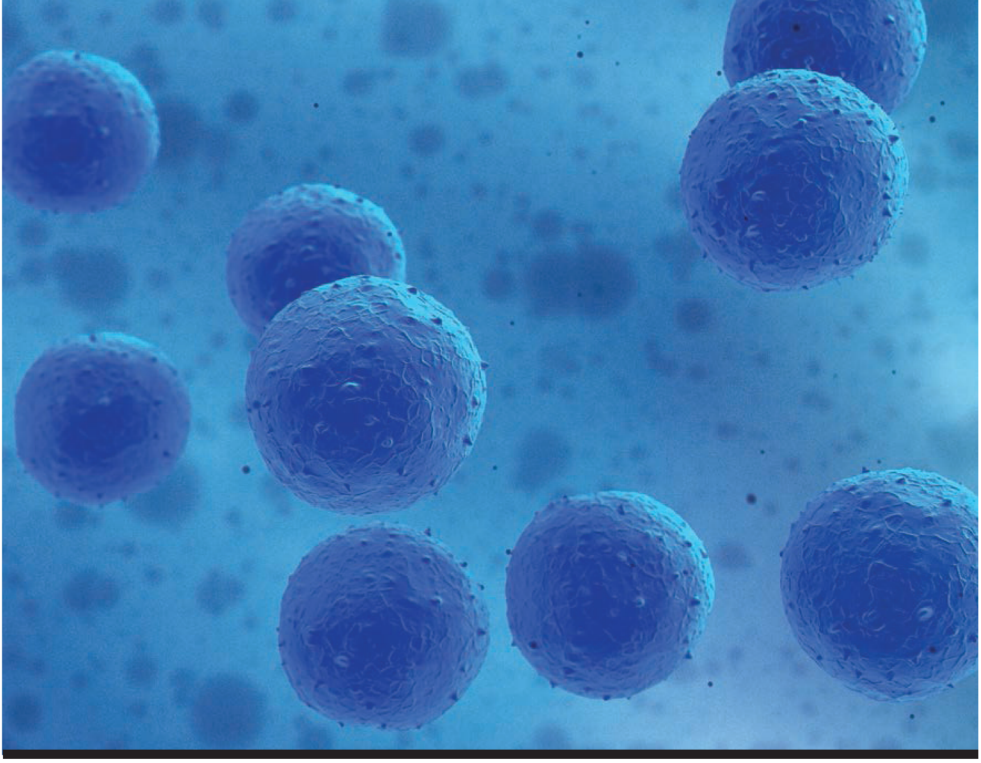
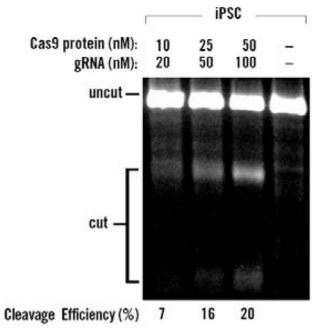


Stem Cell Transfection Solutions

*Trans*IT® Transfection Reagents enable high efficiency transfection of stem cells and other hard to transfect cell types used in stem cell research.

- Perform genome editing with *Trans*IT-X2® Dynamic Delivery System
- Transfect DNA effectively with *Trans*IT®-2020 or *Trans*IT®-LT1 Transfection Reagents
- Perform repeated, low toxicity mRNA transfections using *Trans*IT®-mRNA Transfection Kit
- Electroporate efficiently and cost-effectively with Ingenio® Electroporation Solution



NEW DATA! CRISPR/Cas9 Editing in Human iPSCs

Efficient Genome Editing with CRISPR/Cas9 in Human Induced Pluripotent Stem Cells (iPSCs). The *Trans*IT-X2® Dynamic Delivery System was used to deliver Cas9 protein/guide RNA ribonucleoprotein (RNP) complexes in human induced pluripotent stem cells (iPSCs). For experimental details, please visit: www.mirusbio.com/stemcell

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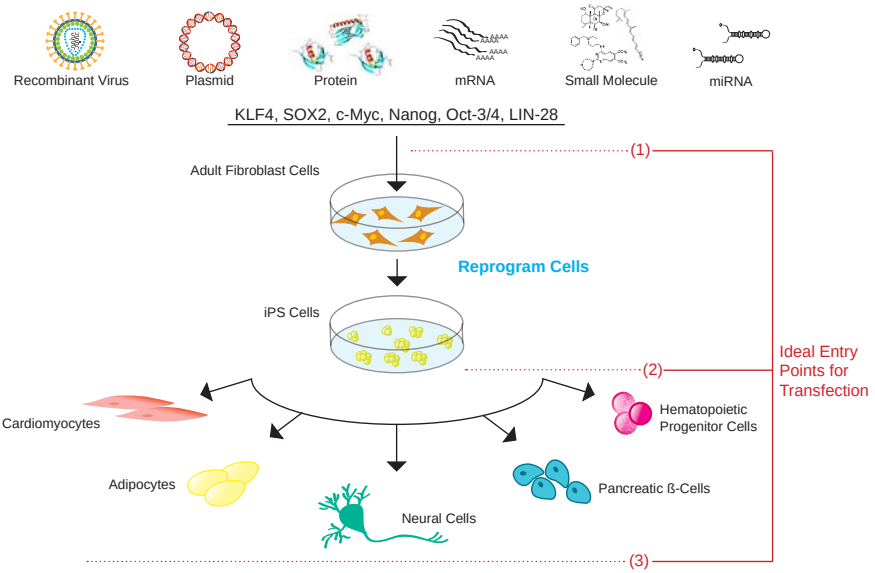
Why Stem Cells?

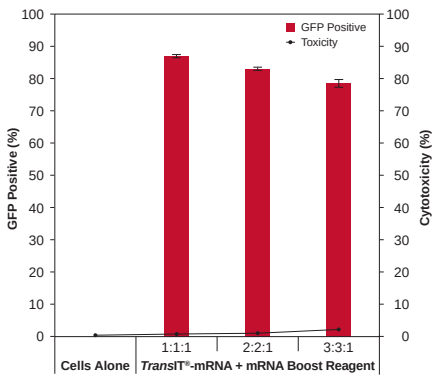
Advances in the field of stem cell differentiation and reprogramming have accelerated drug development by providing disease relevant models for testing. Several of these breakthroughs rely on the use of transfection for non-viral delivery of nucleic acids into different cell types. Mirus Bio provides high efficiency nucleic acid and ribonucleoprotein delivery tools through a suite of *Trans*IT® Transfection Reagents and Ingenio® Electroporation Kits that have been validated for many of these applications.

The Role of Transfection in Stem Cells Applications



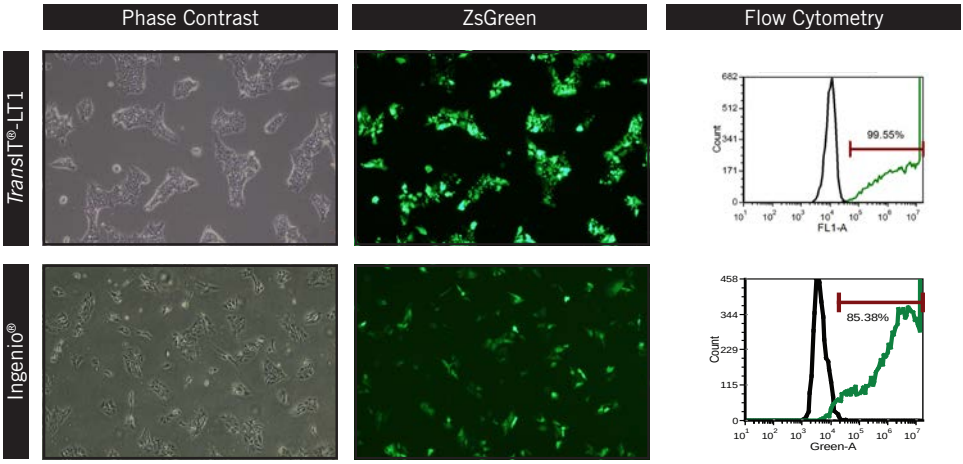
Ideal Entry Points for Transfection in Stem Cell Workflow. Somatic cells such as adult fibroblasts can be transfected or transduced via several methods (e.g. recombinant virus, plasmid, protein, mRNA, small molecule and miRNA) with a combination of transcription factors including KLF4, SOX2, c-Myc, Nanog, Oct-3/4 and LIN-28 to reprogram the cells to a pluripotent state. iPS cells can then be differentiated to a myriad of cell types through growth factor addition and/or transfection of selection markers driven by cell type specific promoters. Stem cell derived cell types such as cardiomyocytes, adipocytes, neural cells, pancreatic-β cells, and hematopoietic progenitor cells can provide researchers with relevant models for their experiments.

Effective, Low Toxicity Delivery of mRNA into Fibroblasts



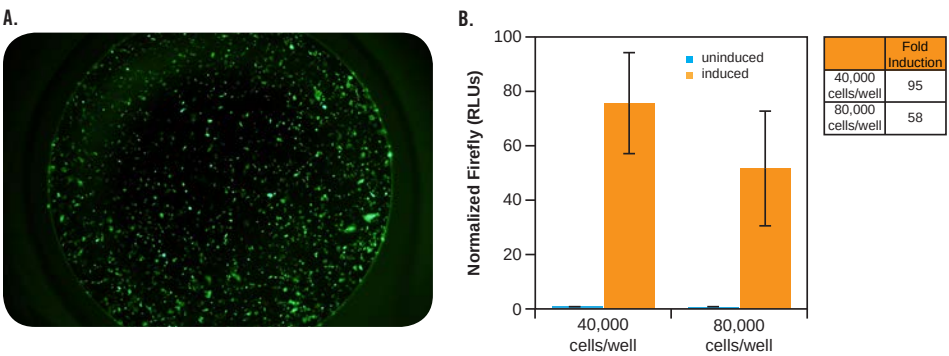
***Trans*IT®-mRNA Provides Effective and Low Toxicity mRNA Transfection.** The *Trans*IT®-mRNA Transfection Kit was used to transfect BJ human neonatal foreskin fibroblasts with GFP mRNA incorporating pseudouridine and 5-Me-C modified bases (Trilink Biotechnologies, Inc.). Transfections were performed using 1-3 µl of *Trans*IT®-mRNA Transfection Reagent and mRNA Boost Reagent to deliver 1 µg of RNA (1:1:1, 2:2:1 and 3:3:1; reagent:boost:RNA ratio). At 18 hours post-transfection, GFP was measured and cytoxicity was measured using propidium iodide stain (black line). For experimental details, please visit: www.mirusbio.com/stemcell

High Efficiency DNA Transfection of Human iPS Cells



Data courtesy of Cellular Dynamics international a FUJIFILM company

Ideal Entry Points for Transfection in Stem Cell Workflow. *Trans*IT®-LT1 Transfection Reagent was used to reverse transfect 1.3 x 10^6 iPS cells with a ZsGreen expressing plasmid (Takara Bio USA). Reverse transfections were performed in 6-well plates using 12 µl of *Trans*IT®-LT1 Transfection Reagent to deliver 4 µg of DNA (3:1, reagent: DNA). The Ingenio® Electroporation Kit was used to transfect 2 x 10^6 iPS cells on the Amaxa® Nucleofector® II/2b Device with 8 µg ZsGreen expressing plasmid in 100 µl and plated in 6-well plates at 0.33 x 10^6 cells/well. Cells were visualized 24 hours post-transfection. Cells were also assayed at 24 hours post-transfection on. The histograms represent the fluorescence intensity of ZsGreen in untransfected cells (black line) compared to cells transfected with plasmid (green line). For experimental details, please visit: www.mirusbio.com/stemcell



Plasmid DNA Delivery to iCell® Cardiomyocytes Using *Trans*IT®-LT1 Transfection Reagent. (A) High efficiency transfection of iCell® Cardiomyocytes (Cellular Dynamics) with a GFP encoding plasmid. Cells were transfected with 100 ng/well of pMAXGFP (Lonza) using *Trans*IT®-LT1 Transfection Reagent with a 2:1 reagent-to-DNA ratio according to the manufacturer's instructions. Fluorescent images were taken 3 days post transfection. (B) cAmp induction measured via a luciferase reporter plasmid. Cells were transfected using *Trans*IT®-LT1 and a CRE-luciferase reporter plasmid. After 18 hours the cAMP pathway was induced using 10 µM isoproterenol for 6 hours. Luciferase activity was measured using the Promega Dual Glo® Luciferase Assay. Data is normalized to the control reporter. For experimental details, please visit: www.mirusbio.com/stemcell

Data courtesy of Cellular Dynamics international a FUJIFILM company

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Delivery by Mirus

Broad Spectrum DNA Transfection	PRODUCT NO.	QUANTITY
*Trans*IT-X2® Dynamic Delivery System 	MIR 6003	0.3 ml
	MIR 6004	0.75 ml
	MIR 6000	1.5 ml
	MIR 6005	5 x 1 ml
	MIR 6006	10 x 1 ml
*Trans*IT®-LT1 Transfection Reagent 	MIR 2300	1 ml
	MIR 2304	0.4 ml
	MIR 2305	5 x 1 ml
	MIR 2306	10 x 1 ml
*Trans*IT®-2020 Transfection Reagent 	MIR 5400	1 ml
	MIR 5404	0.4 ml
	MIR 5405	5 x 1 ml
	MIR 5406	10 x 1 ml

mRNA Transfection	PRODUCT NO.	QUANTITY
*Trans*IT®-mRNA Transfection Kit 	MIR 2250	1 ml
	MIR 2225	0.4 ml
	MIR 2255	5 x 1 ml
	MIR 2256	10 x 1 ml

Electroporation		PRODUCT NO.	QUANTITY
Ingenio® Electroporation Kit 	Compatible with Amaxa® Nucleofactor Device (solution, 0.2 cm cuvettes and cell droppers)	MIR 50112	25 reactions
		MIR 50115	50 reactions
		MIR 50118	100 reactions
Ingenio® Electroporation Kit 	Compatible with Bio-Rad® and Harvard-BTX® electroporation systems (solution, 0.4 cm cuvettes and cell droppers)	MIR 50113	25 reactions
		MIR 50116	50 reactions
		MIR 50119	100 reactions
Ingenio® Electroporation Solution 		MIR 50111	25 reactions
		MIR 50114	50 reactions
		MIR 50117	100 reactions

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