

Tailored Transfection Reagents

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About RJH Biosciences

At RJH Biosciences, we develop novel transfection reagents that deliver different types of nucleic acids to a wide range of mammalian cells in culture, while tailoring the technology further to act as delivery vehicles in preclinical models and clinical nucleic acid therapies. Our reagents display exceptional activity on specific types of cells, while acting broadly for delivery of various nucleic acids.

Transfection Reagents

We offer broadly acting transfection reagents to modify cells with DNA and RNA. These reagents are polymeric in nature and have been optimized for a variety of cell types and applications involving cell culture (in vitro) and animal models (in vivo). We are proud to offer transfection reagents tailored for primary cells and suspension cells, as well as adherent cell lines and animal models.

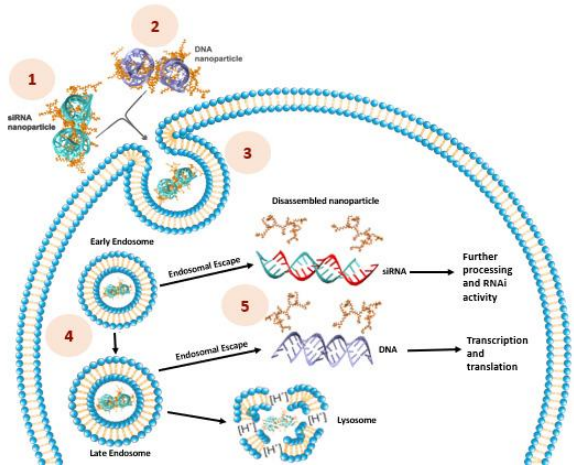
Clinical Development

We are developing novel nucleic acid delivery systems to effectively implement nucleic acid therapeutics in a clinical setting. Our goals are to realize the potential of RNA interference (RNAi) via delivery of siRNA, and to enable transgene expression via direct administration of plasmid DNA (pDNA) and mRNA to express proteins in situ. Partners are actively sought out for various preclinical and clinical programs.

Product Background and Selection

RJH reagents are cationic lipopolymers carefully designed to have the optimal balance of cationic charge and hydrophobic group. Protected, efficient transport across the cell membrane is accomplished due to multivalent interactions with nucleic acids, the synergistic effects of cationic and lipidic binding, and the lipid moieties that enhance cell membrane interactions and internalization.

Once in the cytoplasm, cargo is effectively delivered because the pH buffering capacity of the reagent-nucleic acid complex facilitates easy escape of cargo from endosomes. The figure (right) summarizes the transport mechanism of RJH reagent complexes.



The table below summarizes the suitability of RJH reagents in various applications. The RJH products have been found to be effective with an ever-expanding list of nucleic acids in different cell models, including animal models. RJH products can be purchased in kits that provide the reagent of choice with Trans-Booster to enhance transfection efficiencies in difficult-to-transfect cells.

Transfection Reagents by Nucleic Acid and Cell Type

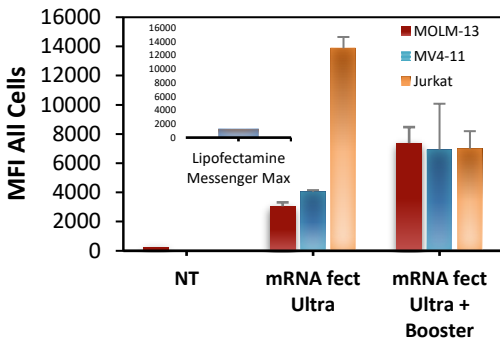
Reagent	Nucleic Acid				Cell Type			
	mRNA	pDNA	siRNA/ miR/ASO	CRISPR	Cell Lines	Primary Cells	Suspension Cells	In Vivo Models
All-Fect		✓	✓	✓	✓	✓	✓	✓
Prime-Fect	✓	✓	✓		✓	✓	✓	
Leu-Fect B		✓	✓			✓	✓	✓
Trans-Booster	✓	✓		✓	✓	✓	✓	
mRNA-Fect	✓			✓		✓	✓	✓
mRNA-Fect ULTRA	✓			✓		✓	✓	✓
CRISP-Fect				✓	✓	✓		

Transfection Reagents Tested In-House in Specific Cell Types

Primary Cells	All-Fect	Prime-Fect	Leu-Fect B	Trans-Booster	mRNA-Fect	mRNA-Fect ULTRA	CRISP-Fect
Umbilical Cord Blood Derived Mesenchymal Stem Cells (UCB-MSC)	pDNA	pDNA		pDNA, mRNA			
Bone Marrow Derived Mesenchymal Stem Cells (BM-MS C)	pDNA	pDNA		pDNA, mRNA			
Vascular Smooth Muscle Cells (VSMCs)		pDNA		pDNA, mRNA			
Human Umbilical Vein Endothelial Cells (HUVECs)				pDNA, mRNA			
Bone Marrow Mononuclear Cells from CML Patients			siRNA	pDNA, mRNA			
Human Foreskin Fibroblast Cells		pDNA					
Mouse Osteoblasts	pDNA						
Peripheral Blood Mononuclear Cells	pDNA			pDNA, mRNA	mRNA	mRNA	
Cell Lines							
Kidney Fibroblast Cells (293-T)	pDNA	pDNA		pDNA, mRNA			
Breast Cancer Cells (MDA-MB-231)	pDNA, siRNA	siRNA	pDNA	pDNA, mRNA	mRNA	mRNA	RNP
Kidney Epithelial Cells (MDCK)		siRNA					
Breast Cancer/Melanoma Cells (MDA-MB-436)		siRNA		pDNA, mRNA	mRNA	mRNA	
Breast Cancer Cells (MDA-MB-468)		siRNA					
Breast Cancer Cells (Sum-149PT)		siRNA		pDNA, mRNA			
Breast Cancer Cells (MCF-7)	pDNA	pDNA, siRNA		pDNA, mRNA	mRNA	mRNA	
Human Lymphoma Cells (U-937)	pDNA	pDNA					
Chronic Myeloid Leukaemia Cells (K562)	siRNA			pDNA, mRNA	mRNA	mRNA	
Acute Myeloid Leukemia Cells (KG1, KG1A, MC4-11, MOLM-13, THP-1)	siRNA		siRNA				
Acute Lymphocytic Leukemia Cells (RS4:11)	siRNA		siRNA		mRNA	mRNA	
Human Lung Cancer Cells (A549)	pDNA	siRNA					
Human Colon Cancer (HCT-116)	siRNA	siRNA					
Human Myoblasts							
Jurkat Cells	pDNA				mRNA	mRNA	RNP

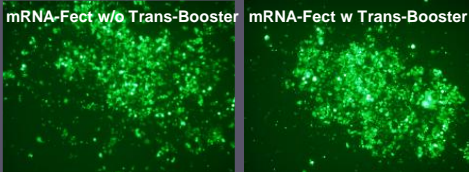
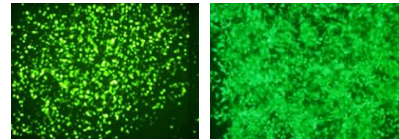
mRNA Delivery

mRNA-Fect, our prior version, and mRNA-Fect ULTRA are both tailored for mRNA delivery to attachment-dependent and suspension-growing cells. Each is available as a stand-alone reagent, with mRNA-Fect also offered in a kit with Trans-Booster. While both remain available for sale, we now recommend mRNA-Fect ULTRA for optimal performance.



Transfecting MOLM-13, MV4-11, and Jurkat cell lines with GFP-expressing mRNA using mRNA-Fect ULTRA. The mean fluorescence intensity (MFI) of all cells is quantified using flow cytometry. mRNA-Fect ULTRA demonstrates transfection performance compared to Lipofectamine MessengerMAX across these suspension-growing, difficult-to-transfect cell lines.

Transfecting Jurkat suspension cells (left) and A549 attachment cells (right) with GFP-expressing mRNA using mRNA-Fect ULTRA. Effective mRNA delivery was achieved in both cell types, as visualized by fluorescent microscopy, demonstrating mRNA-Fect ULTRA's versatility across suspension and attachment cell lines."

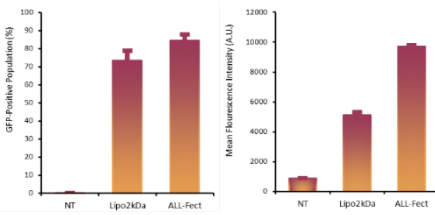


Neuro 2A cells transfected with a GFP-expressing mRNA using mRNA-Fect with and without Trans-Booster. The Trans-Booster enhances transfection efficiencies with mRNA in N2a cells.

	Volume	Conc	SKU
mRNA-Fect Reagent of choice for in vitro mRNA transfections	0.75 mL	1 mg/mL	80-10
	1.5 mL	1 mg/mL	80-20
mRNA-Fect ULTRA Reagent of choice for in vitro mRNA transfections	0.75 mL	1 mg/mL	80-11
	1.5 mL	1 mg/mL	80-21
mRNA-Fect In Vivo Reagent of choice for in vivo mRNA transfections	1.0 mL	5 mg/mL	80-30
mRNA-Fect Kit Includes mRNA-Fect and Trans-Booster for enhanced efficiency	0.75 mL	1 mg/mL	80-40
	0.75 mL	0.4 mg/mL	
	1.5 mL	1 mg/mL	80-50
	1.5 mL	0.4 mg/mL	
mRNA-Fect In Vivo Kit Includes In Vivo mRNA-Fect and Trans-Booster for enhanced efficiency	1.0 mL	5 mg/mL	80-60
	1.0 mL	2 mg/mL	

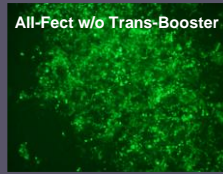
DNA Delivery

All-Fect is a versatile transfection reagent for pDNA delivery to a wide range of cells. All-Fect In Vivo is recommended for use in animal models while Prime-Fect is recommended for use on primary cells. The reagents are also available as a kit with Trans-Booster to maximize transfection efficiency.

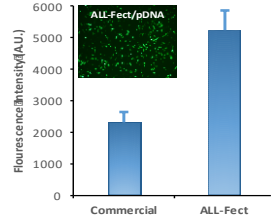


Transfecting Neuro 2A cells with a GFP-expressing pDNA using All-Fect and Lipofectamine™ 2000. GFP expression was evaluated using flow cytometry. High transfection efficiencies were achieved using the RJH reagent All-Fect.

Using All-Fect and Trans-Booster to transport GFP-expressing pDNA into N2a cells. High GFP expression was evident, with Trans-Booster increasing GFP-expression.



pDNA delivery to MDA-MB-231 cells using All-Fect and a leading lipofection reagent. GFP-expression pDNAs were delivered to cells and GFP fluorescence was quantified using flow cytometry 2 days after transfection. All-Fect exhibits significantly greater efficiencies than the competing commercial reagent.

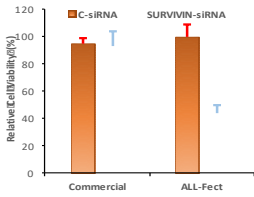
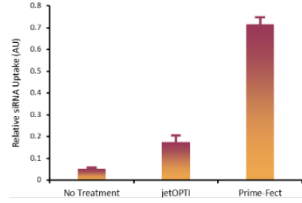


	Volume	Conc	SKU
All-Fect A broadly acting transfection reagent designed for pDNA delivery	0.75 mL	1 mg/mL	10-10
	1.50 mL	1 mg/mL	10-20
All-Fect In Vivo A broadly acting transfection reagent designed for in vivo pDNA delivery	1.0 mL	5 mg/mL	10-30
All-Fect Kit Includes All-Fect and Trans-Booster for enhanced efficiency	0.75 mL	1 mg/mL	10-40
	0.75 mL	0.4 mg/mL	
	1.5 mL	1 mg/mL	10-50
	1.5 mL	0.4 mg/mL	
All-Fect In Vivo Kit Includes in vivo All-Fect and Trans-Booster for enhanced efficiency	1.0 mL	5 mg/mL	10-60
	1.0 mL	2 mg/mL	
Prime-Fect In Vivo Kit Includes Prime-Fect and Trans-Booster for enhanced efficiency	0.75 mL	1 mg/mL	20-40
	0.75 mL	0.4 mg/mL	
	1.5 mL	1 mg/mL	20-50
	1.5 mL	0.4 mg/mL	

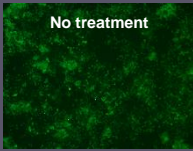
siRNA/microRNA/ASO Delivery

Leu-Fect B, Prime-Fect and All-Fect are effective for delivery of small RNA compounds to a range of attachment-dependent and suspension-growing cells. All-Fect In Vivo and Leu-Fect reagents are recommended for use in animal models.

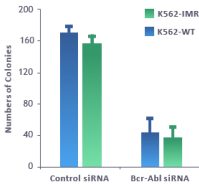
Delivery of FAM-labeled siRNA to Neuro 2A cells using Prime-Fect. Prime-Fect provided higher transfection efficiencies than a leading commercial reagent.



Survivin silencing in K562 and resultant inhibition of cell growth using siRNA with All-Fect and a leading lipofection reagent. Relative cell viability was used to quantify effectiveness of survivin silencing. All-Fect significantly outperformed the competing lipofection reagent.



Silencing GFP-tagged mutant HTT (Exon 1) protein in N2a cells using Leu-Fect reagent and Trans-Booster with a GFP siRNA and a control siRNA. GFP expression is efficiently silenced in cells with minimal toxicity.



Colony formation assay by wild-type K562 (K562-WT) and drug resistant K562 (K562-IMR) cells following delivery of control and Bcr-Abl siRNA using Leu-Fect. A significant decrease in colony formation is observed in both cell types.

Leu-Fect B

Designed for siRNA delivery to suspension-growing cells

Volume	Conc	SKU
0.75 mL	1 mg/mL	40-10

All-Fect

A broadly acting transfection reagent suitable for pDNA and siRNA delivery

1.50 mL	1 mg/mL	40-20
0.75 mL	1 mg/mL	10-10
1.50 mL	1 mg/mL	10-20

Prime-Fect

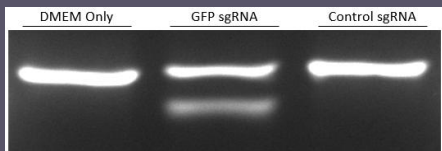
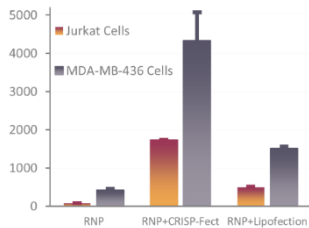
Reagent of choice for hard-to-transfect cells with pDNA and siRNA

0.75 mL	1 mg/mL	20-10
1.50 mL	1 mg/mL	20-20

CRISPR Delivery

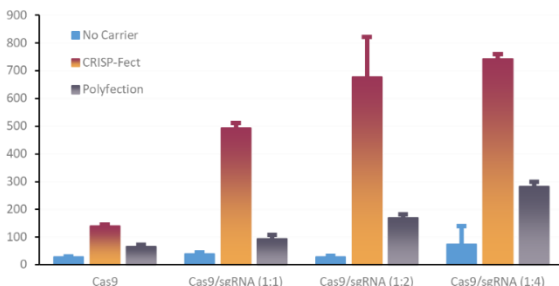
All-Fect and mRNA-Fect are versatile reagents to implement pDNA and mRNA based CRISPR protocols, respectively. CRISP-Fect is recommended for delivery of ribonucleoprotein (RNP) complexes to implement CRISPR. These reagents are tested for CRISPR under cell culture conditions only.

Transfection of Jurkat T-cells and breast cancer MDA-MB-436 cells using CRISP-Fect with Cas9/sgRNA complexes. RNP uptake was analyzed by using FITC-labeled Cas9 (courtesy of CasZyme Corp.) and measuring fluorescence. In both cell types, CRISP-Fect was highly efficient in delivering RNPs to cells, compared to a commonly used lipofection reagent.



T7E1 Assay on the GFP locus of Neuro 2A cells stably expressing GFP-tagged mutant HTT, transfected using All-Fect. Editing of the GFP locus by Cas9 is evident with a GFP-specific sgRNA, but not a non-specific sgRNA.

Optimization of Cas9/sgRNA ratios in Jurkat T-cells for RNP Uptake. CRISP-Fect has consistently provided higher transfection efficiencies than a competing commercial reagent.



All-Fect

A broadly acting transfection reagent for pDNA and siRNA delivery

All-Fect Kit

Includes All-Fect and Trans-Booster to enhance transfection efficiencies

mRNA-Fect

Reagent of choice for in vitro mRNA transfections

mRNA-Fect Kit

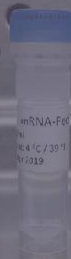
Includes mRNA-Fect and Trans-Booster for enhance efficiency

CRISP-Fect

Reagent of choice for RNP complex transfections

	Volume	Conc	SKU
All-Fect	0.75 mL	1 mg/mL	10-10
	1.50 mL	1 mg/mL	10-20
All-Fect Kit	0.75 mL	1 mg/mL	10-40
	0.75 mL	0.4 mg/mL	10-40
	1.50 mL	1 mg/mL	10-50
	1.50 mL	0.4 mg/mL	10-50
mRNA-Fect	0.75 mL	1 mg/mL	80-10
	1.50 mL	1 mg/mL	80-20
mRNA-Fect Kit	0.75 mL	1 mg/mL	80-40
	0.75 mL	0.4 mg/mL	80-40
	1.50 mL	1 mg/mL	80-50
	1.50 mL	0.4 mg/mL	80-50
CRISP-Fect	0.75 mL	1 mg/mL	90-10
	0.75 mL	0.4 mg/mL	90-10
	1.50 mL	1 mg/mL	90-20
	1.50 mL	0.4 mg/mL	90-20

Product Summary



	Volume	Conc	SKU
All-Fect DNA, siRNA/microRNA/ASO, and CRISPR delivery	0.75 mL	1 mg/mL	10-10
	1.50 mL	1 mg/mL	10-20
All-Fect In Vivo DNA delivery	1.00 mL	5 mg/mL	10-30
All-Fect Kit DNA and CRISPR delivery	0.75 mL	1mg/mL	10-40
	0.75 mL	0.4 mg/mL	
	1.50 mL	1mg/mL	10-50
All-Fect In Vivo Kit DNA delivery	1.00 mL	5 mg/mL	10-60
	1.00 mL	2 mg/mL	
Prime-Fect DNA and siRNA/microRNA/ASO delivery	0.75 mL	1 mg/mL	20-10
	1.50 mL	1 mg/mL	20-20
Prime-Fect In Vivo Kit DNA delivery	0.75 mL	1mg/mL	20-40
	0.75 mL	0.4 mg/mL	
	1.50 mL	1mg/mL	20-50
	1.50 mL	0.4 mg/mL	
Leu-Fect B siRNA/microRNA/ASO delivery	0.75 mL	1 mg/mL	40-10
	1.50 mL	1 mg/mL	40-20
mRNA-Fect mRNA and CRISPR delivery	0.75 mL	1 mg/mL	80-10
	1.50 mL	1 mg/mL	80-20
mRNA-Fect ULTRA Ultimate mRNA delivery	0.75 mL	1 mg/mL	80-11
	1.50 mL	1 mg/mL	80-21
mRNA-Fect In Vivo mRNA delivery	1.00 mL	5 mg/mL	80-30
mRNA-Fect Kit mRNA and CRISPR delivery	0.75 mL	1mg/mL	80-40
	0.75 mL	0.4 mg/mL	
	1.50 mL	1mg/mL	80-50
	1.50 mL	0.4 mg/mL	
mRNA-Fect In Vivo Kit mRNA delivery	1.00 mL	5 mg/mL	80-60
	1.00 mL	2 mg/mL	
CRISP-Fect CRISPR delivery	0.75 mL	1mg/mL	90-10
	0.75 mL	0.4 mg/mL	
	1.50 mL	1mg/mL	90-20
	1.50 mL	0.4 mg/mL	



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