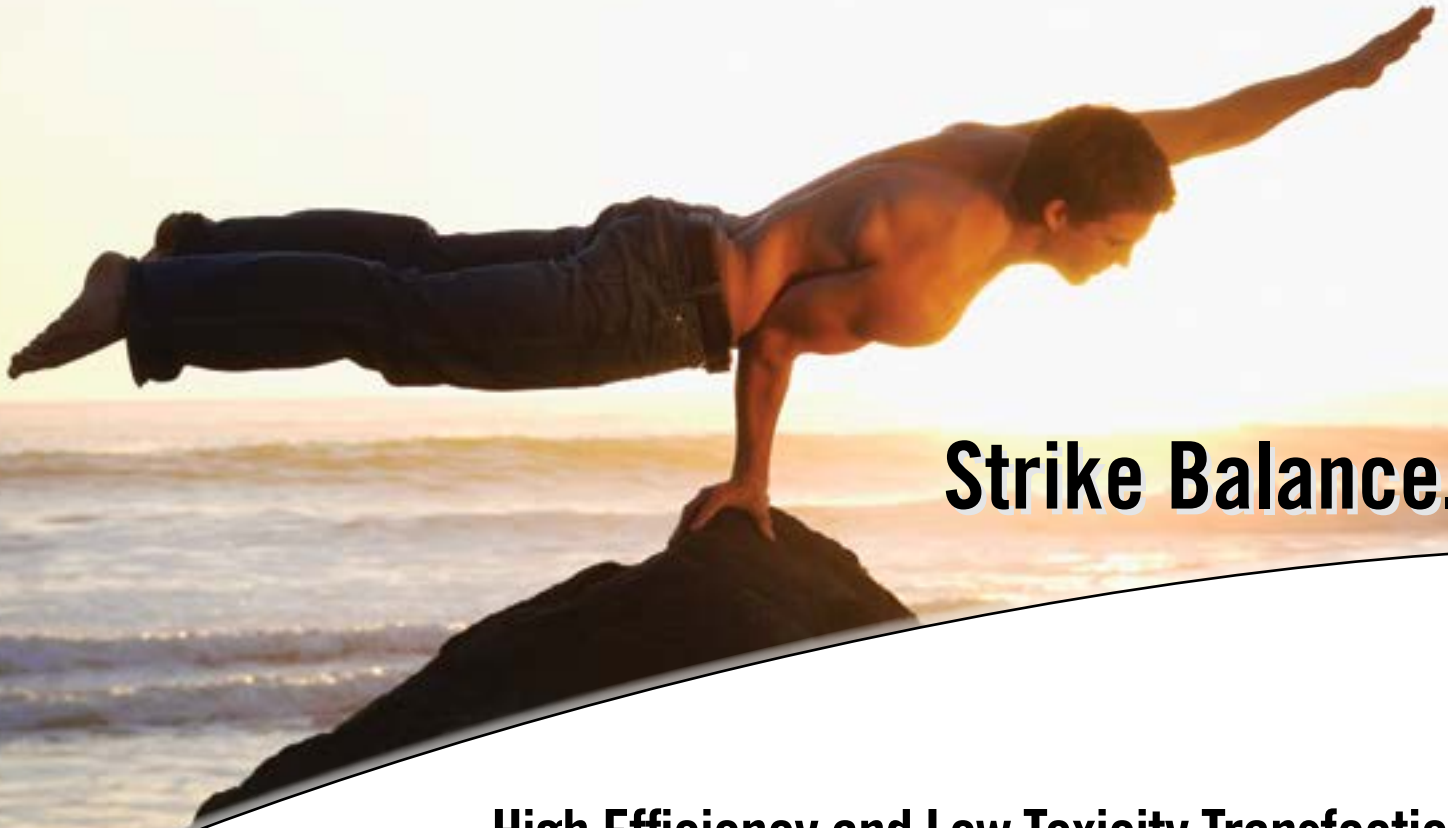




The Transfection Experts



Strike Balance.

High Efficiency and Low Toxicity Transfection with *TransIT*[®] Transfection Reagents

Providing researchers gene delivery expertise since 1995,
Mirus *TransIT*[®] transfection reagents give researchers:

- High efficiency, low toxicity transfections
- Minimal off-target effects
- Reduction in experimental bias

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Providing gene delivery expertise since 1995

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Why is toxicity an issue?

Understanding the impact of transfection mediated toxicity is important for every researcher. Observed toxicity is largely dependent on the transfection reagent and cell type. Choosing a transfection reagent that balances high efficiency nucleic acid delivery and low cellular toxicity is imperative to achieving reliable experimental results. Providing gene delivery expertise since 1995, Mirus *TransIT*[®] transfection reagents give researchers:

- High efficiency, low toxicity transfections
- Minimal off-target effects
- Reduction in experimental bias

Minimize Off-target Effects

Since changes in gene expression accompany most toxic responses, gene expression analysis was conducted to identify the genes affected by transfection mediated toxicity.

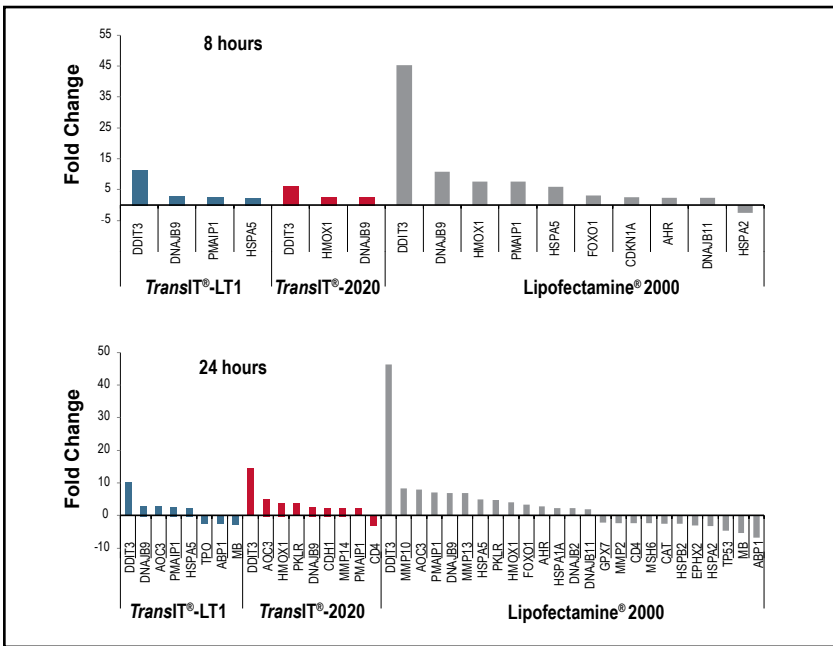
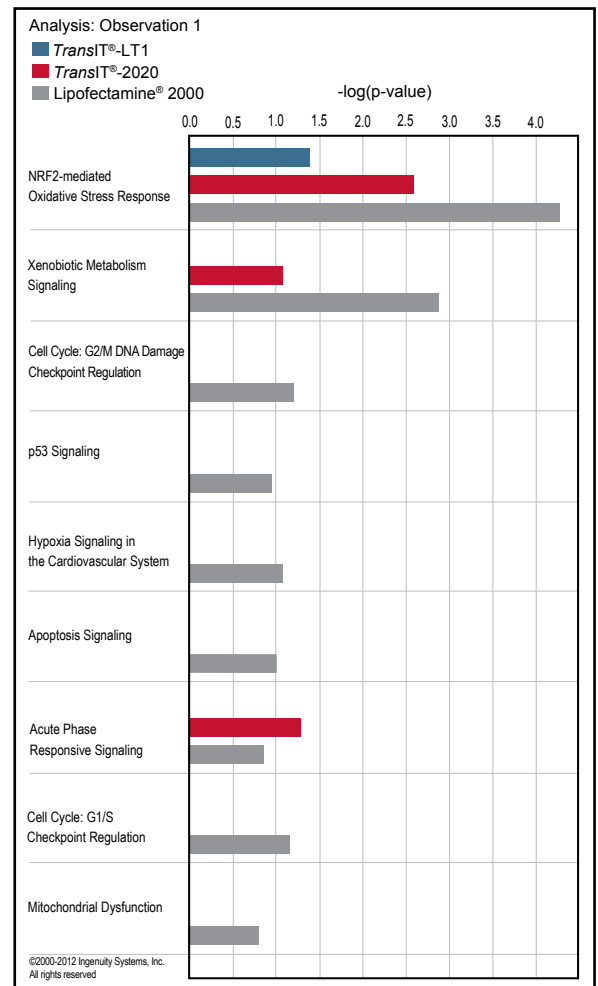


Figure 1. Mirus *TransIT*[®] Transfection Reagents Minimize the Stress Response in Transfected HeLa Cells. Stress-related gene expression changes were determined by RT-qPCR from total RNA samples harvested from HeLa cells that were transfected with *TransIT*[®]-LT1, *TransIT*[®]-2020 or Lipofectamine[®] 2000 at 8 and 24 hours. Eighty-four genes were analyzed using the Human Stress Response 96 *StellARray*[™] (Lonza). At both time points, the number and magnitude of stress-related gene expression changes were lower when cells were transfected with *TransIT*[®]-LT1 or *TransIT*[®]-2020 than when cells were transfected with Lipofectamine[®] 2000.

Figure 2. Transfections with *TransIT*[®]-LT1 or *TransIT*[®]-2020 Affect Fewer Core Pathways than Transfections with Lipofectamine[®] 2000. Canonical pathway enrichment analysis shows the primary biological processes impacted in HeLa cells that were transfected with *TransIT*[®]-LT1, *TransIT*[®]-2020 or Lipofectamine[®] 2000 at 24 hours. The negative log of the p values is the probability of obtaining these genes associated with the given pathways by random chance. The bar line at the bottom of each graph is derived from the ratio of the number of genes on our list associated with a given pathway divided by the total number of genes that make up that pathway. Pathway analysis was performed using Pathway Analysis (Ingenuity Systems). Representative data from two independent tests is shown.



Achieve High Efficiency Transfection with Low Toxicity

To evaluate transfection efficiency and the role of transfection-related toxicity, time course and dose-dependent experiments were conducted. HeLa cells were transfected with various concentrations of transfection complexes for 24 hours. Transfection toxicity was then evaluated through morphology (Figure 3) and by lactate dehydrogenase (LDH) leakage assays (Figure 4).

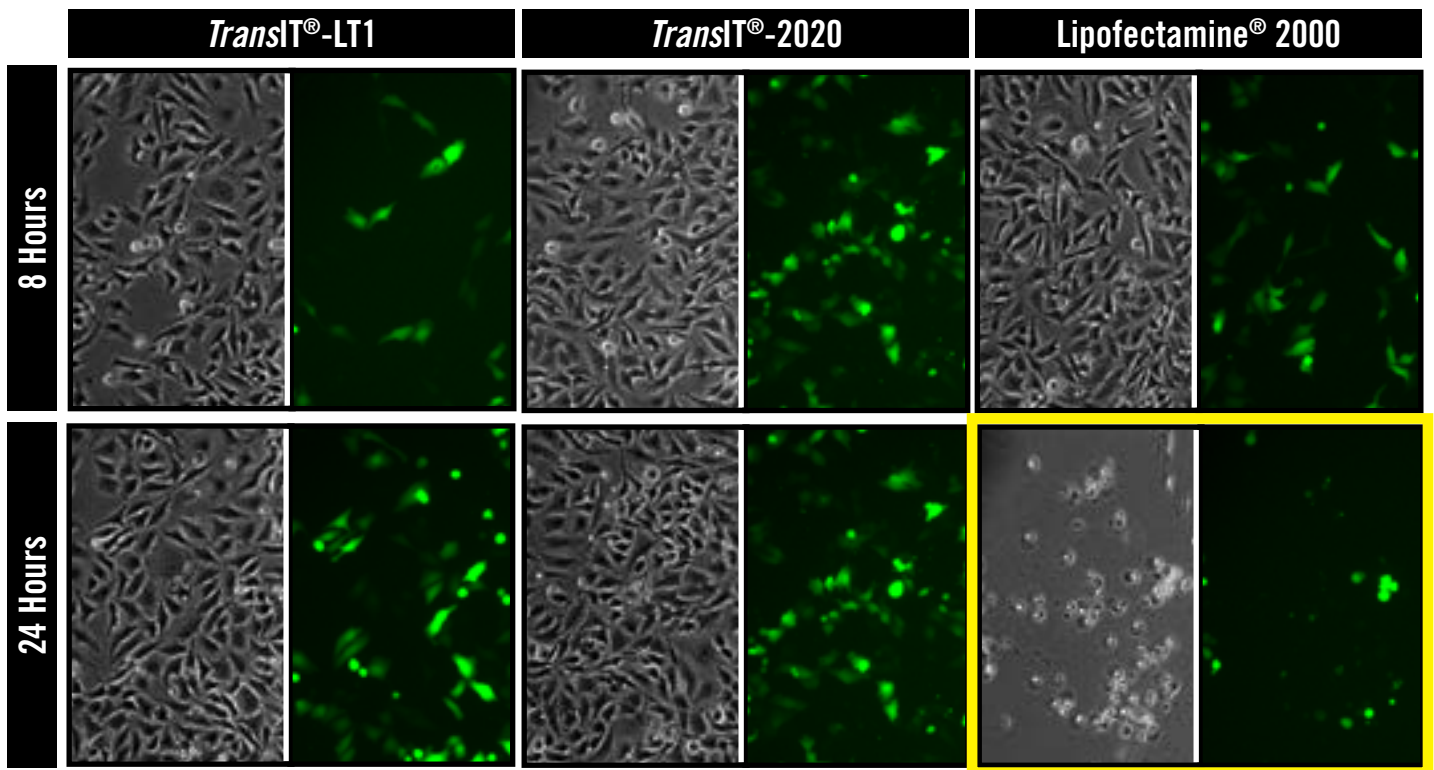
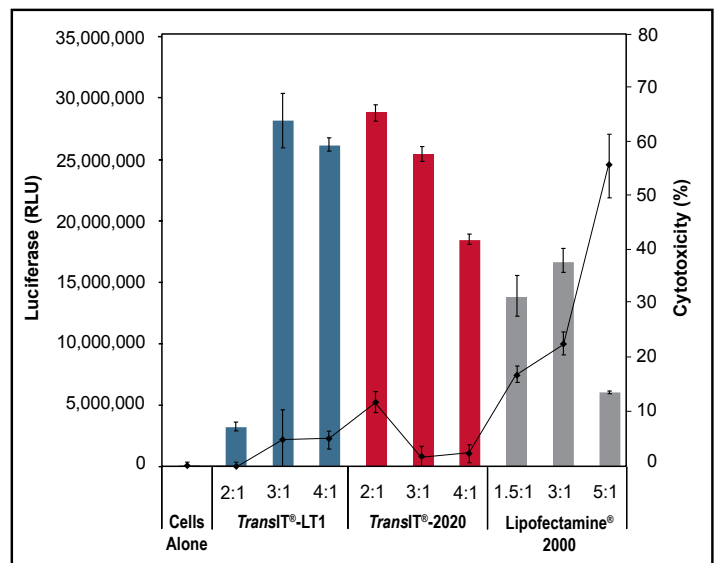


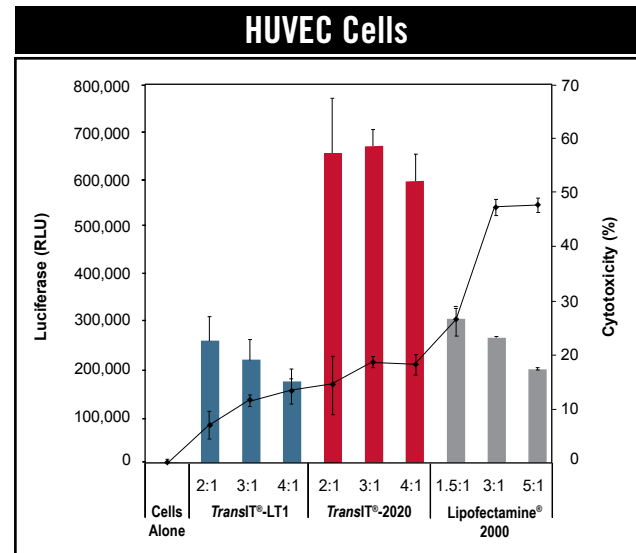
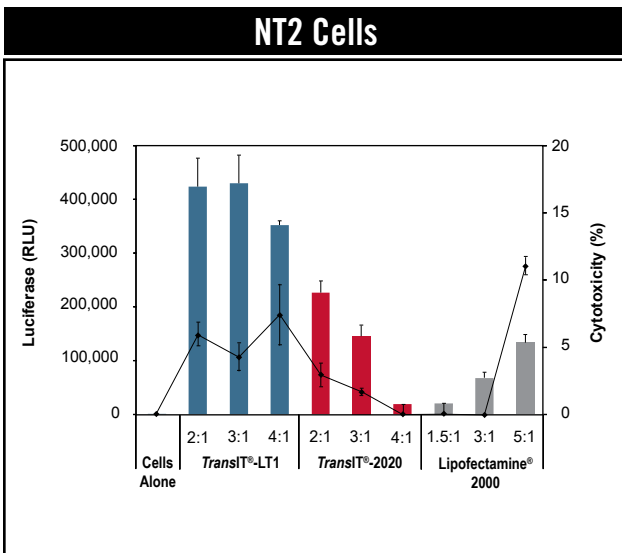
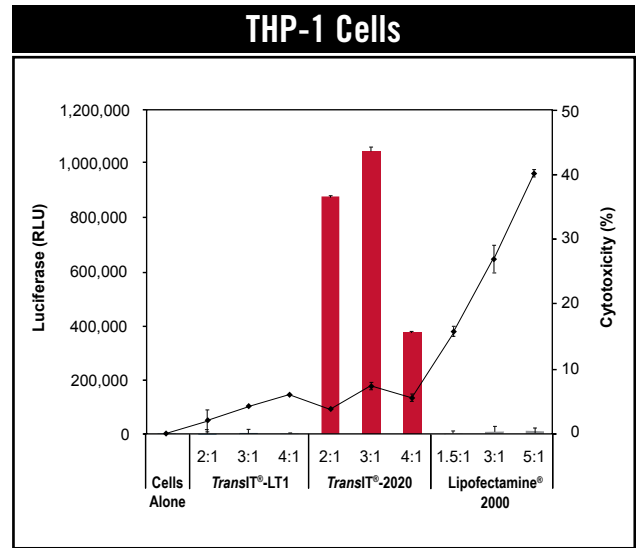
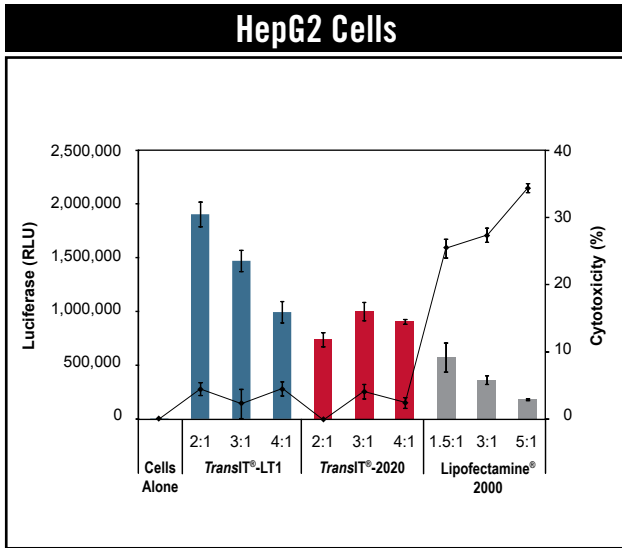
Figure 3. Mirus Broad Spectrum Transfection Reagents, *TransIT*®-LT1 and *TransIT*®-2020 Outperform Lipofectamine® 2000. HeLa cells were transfected with a GFP encoding plasmid DNA using either *TransIT*®-LT1, *TransIT*®-2020 or Lipofectamine® 2000 at reagent-to-DNA ratios of 3:1 for all reagents. Phase contrast and GFP images were taken in the same field of view at 8 and 24 hours post-transfection. Cells transfected with *TransIT*®-LT1, *TransIT*®-2020 remain healthy after 24 hours while maintaining high transfection efficiency, whereas cells transfected with Lipofectamine® 2000 display significant cytotoxicity after 24 hours.

Figure 4. *TransIT*® Broad Spectrum Reagents Balance High Efficiency Delivery with Low Toxicity. HeLa cells were transfected with luciferase encoding plasmid DNA using either *TransIT*®-LT1, *TransIT*®-2020 or Lipofectamine® 2000 for 24 hours. Transfection was measured by luciferase activity using a conventional assay. Cytotoxicity was assessed by quantifying the LDH released from the cytosol of damaged cells compared to cells alone. Higher transfection efficiency and lower cytotoxicity was observed in cells transfected with *TransIT*®-LT1 and *TransIT*®-2020 at optimal ratios than cells transfected with Lipofectamine® 2000.



Deliver to Many Cell Types with Minimal Toxicity Using *TransIT*[®] Transfection Reagents

Four commonly used cell types: HepG2, THP-1, NT2 and HUVEC were analyzed for luciferase expression as well as cytotoxicity using a lactate dehydrogenase (LDH) assay for membrane leakage. At recommended doses, both *TransIT*[®]-LT1 and *TransIT*[®]-2020 display only minor cytotoxicity while delivering plasmid DNA with high efficiency into all four different cell lines tested. However, toxicity was most apparent, sometimes reading near 50% when using Lipofectamine[®] 2000 to deliver nucleic acid.



Broad Spectrum Transfection Reagents

Product Name	Product No.	Quantity
<i>TransIT</i> [®] -LT1 Transfection Reagent	MIR 2300	1 ml
	MIR 2304	0.4 ml
	MIR 2305	5 x 1 ml
	MIR 2306	10 x 1 ml
	MIR 2306	10 x 1 ml
<i>TransIT</i> [®] -2020 Transfection Reagent	MIR 5400	1 ml
	MIR 5404	0.4 ml
	MIR 5405	5 x 1 ml
	MIR 5406	10 x 1 ml
	MIR 5406	10 x 1 ml

Prove it to Yourself with a **FREE** Sample



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1. Visit us at www.TheTransfectionExperts.com
2. Call us at 888.530.0801