Transfecting Plasmid DNA into Jurkat Cells Using Lipofectamine™ LTX Reagent

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Introduction
Lipofectamine™ LTX Reagent is a proprietary, animal-origin free formulation for the transfection of DNA into eukaryotic cells with low cytotoxicity. This reference provides a recommended procedure to transfect plasmid DNA into human Jurkat Human T-Cell Leukemia Cells (ATCC Cat. No. TIB-152) using Lipofectamine™ LTX Reagent (Cat. No. 15338-100).

Important Guidelines for Transfection
Follow these important guidelines when transfecting DNA into Jurkat cells using Lipofectamine™ LTX Reagent:

• The addition of antibiotics to media during transfection may result in cell death, and has not been tested for Jurkat cells. If you wish to use antibiotics during transfection, test your conditions thoroughly.
• Maintain the same seeding conditions between experiments. Use low-passage cells; make sure that cells are healthy and greater than 90% viable before transfection.
• Transfection can be performed both in the presence or absence of serum. Test serum-free media for compatibility with Lipofectamine™ LTX Reagent.
• Using PLUS™ Reagent (Cat. No. 11514-015) enhances transfection performance in Jurkat cells.
• We recommend Opti-MEM® I Reduced Serum Medium (Cat. No. 31985-062) to dilute the DNA and Lipofectamine™ LTX Reagent before complexing.
• Visit www.invitrogen.com/transfection or contact Technical Service for other specialized transfection protocols (including cell-type specific advice on use of PLUS™ Reagent and antibiotics, and a protocol for vector-based RNAi).
• Lipofectamine™ LTX Reagent performs well with vector-based RNAi experiments. For siRNA and Stealth™ RNAi transfections, we recommend Lipofectamine™ RNAiMAX (Cat. No. 13778-075). Go to www.invitrogen.com/RNAi or contact Technical Service for more information.

Part no.: 25-0940W Revised Date:11 July 2006
Materials Needed
Have the following reagents on hand before beginning:

- Jurkat cells maintained in RPMI with L-glutamine (Cat. No. 11875-085) supplemented with 10% fetal bovine serum (Cat. No. 26140-079), and 0.1 mM MEM Non-Essential Amino Acids Solution (cat. No. 11140-050). Grow cells at 37°C with 5% CO₂.
- Plasmid DNA of interest (100 ng/µl or higher)
- Lipofectamine™ LTX Reagent (store at +4°C until use), and PLUS™ Reagent (if desired; store at 4°C)
- Opti-MEM® I Reduced Serum Medium
- Appropriate tissue culture plates and supplies

Transfection of Jurkat Cells
Use this procedure to transfect plasmid DNA into Jurkat cells in a 24-well format (for other formats, see Scaling Up or Down Transfections, below). All amounts and volumes are given on a per well basis.

1. The day of transfection, count the cells to determine culture density. Plate 1 x 10⁵ cells per well in 0.5 ml of complete growth medium. Cell density should be ~80% confluent on the day of transfection.
2. For each well of cells to be transfected, dilute 0.5 µg of DNA into 100 µl of Opti-MEM® I Reduced Serum Medium without serum.
3. If using PLUS™ Reagent: Mix PLUS™ Reagent gently before use, then add 0.5 µl PLUS™ Reagent (a 1:1 ratio to DNA) directly to the diluted DNA. Mix gently and incubate for 5-15 minutes at room temperature.
4. For each well of cells, dilute 1.25-2.75 µl of Lipofectamine™ LTX into the above diluted DNA solution, mix gently and incubate for 25 minutes at room temperature to form DNA-Lipofectamine™ LTX complexes.
5. Add 100 µl of the DNA-Lipofectamine™ LTX complexes directly to each well containing cells and mix gently by rocking the plate back and forth.
6. Complexes do not have to be removed following transfection. Incubate the cells at 37°C in a CO₂ incubator for 18-24 hours post-transfection before assaying for transgene expression.

Scaling Up or Down Transfections
To transfect Jurkat cells in different tissue culture formats, vary the amounts of Lipofectamine™ LTX Reagent, DNA, cells, medium and PLUS™ Reagent used in proportion to the relative surface area, as shown in the table (amounts given on a per well basis).

<table>
<thead>
<tr>
<th>Culture vessel</th>
<th>Surface area per well¹</th>
<th>Volume plating medium</th>
<th>Cells per well</th>
<th>Volume dilution medium²</th>
<th>DNA</th>
<th>Lipofectamine™ LTX Reagent</th>
<th>PLUS™ Reagent</th>
</tr>
</thead>
<tbody>
<tr>
<td>96-well</td>
<td>0.3 cm²</td>
<td>100 µl</td>
<td>2 x 10⁴</td>
<td>20 µl</td>
<td>100 ng</td>
<td>0.25 - 0.55 µl</td>
<td>0.1 µl</td>
</tr>
<tr>
<td>48-well</td>
<td>1 cm²</td>
<td>200 µl</td>
<td>5 x 10⁴</td>
<td>40 µl</td>
<td>200 ng</td>
<td>0.5 - 1.1 µl</td>
<td>0.2 µl</td>
</tr>
<tr>
<td>24-well</td>
<td>2 cm²</td>
<td>500 µl</td>
<td>1 x 10⁵</td>
<td>100 µl</td>
<td>500 ng</td>
<td>1.25 - 2.75 µl</td>
<td>0.5 µl</td>
</tr>
<tr>
<td>12-well</td>
<td>4 cm²</td>
<td>1 ml</td>
<td>2 x 10⁵</td>
<td>200 µl</td>
<td>1 µg</td>
<td>2.5 - 5.5 µl</td>
<td>1.0 µl</td>
</tr>
<tr>
<td>6-well</td>
<td>10 cm²</td>
<td>2 ml</td>
<td>5 x 10⁵</td>
<td>500 µl</td>
<td>2.5 µg</td>
<td>6.25 - 13.75 µl</td>
<td>2.5 µl</td>
</tr>
</tbody>
</table>

¹Surface areas may vary depending on the manufacturer.
²If the volume of Lipofectamine™ LTX Reagent is too small to dispense accurately, and you cannot pool dilutions, predilute Lipofectamine™ LTX Reagent 10-fold in Opti-MEM® I Reduced Serum Medium, and dispense a 10-fold higher amount (should be at least 1.0 µl per well). Discard any unused diluted Lipofectamine™ LTX Reagent.

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