



DL39(DE3) Chemically Competent Cells

Manual

Catalog #	Package Size
1064-06	6x50µl
1064-24	24x50µl



Important!

-80°C Storage Required

- * Immediately inspect packages
- * Freeze upon receipt



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Intact Genomics, Inc.

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Description:

Intact Genomics chemically competent DL39(DE3) E. coli cells are specific for transformation and protein expression in order to uniformly and specifically label :e.g. phenylalanine or leucine residues. DL39(DE3) can also be used to reduce NMR cross-labeling via transaminase activity for valine, leucine, isoleucine, aspartate, phenylalanine, tyrosine and tryptophan residues.

Specifications:

Competent cell type: Chemically Competent

Strain: DL39

Species: *E. coli*

Format: Tubes

Transformation efficiency: $\geq 3.0 \times 10^7$ cfu/ μ g pUC19 DNA

Shipping condition: Dry ice

Reagents Needed for One Reaction:

- DL39(DE3) Chemically Competent Cells: 50 μ l
- DNA (or pUC19 Control, 10 pg/ μ l): 1 μ l
- Recovery medium: 1 ml

Product Components & Storage:

- DL39(DE3) Chemically Competent Cells: -80 °C
- pUC19 control DNA: -20 °C
- Recovery medium: 4 °C

Genomic Features:

DL39(DE3) chemically competent cells have the following features:

- Deficient in the aromatic (TyrB), branched-chain (JivE), and aspartate (AspC) transaminases.
- Modified to contain the T7 expression system

Genotype:

F-, λ -, aspC13, fnr-25, rph-1, ilvE12, tyrB507, λ DE3

Quality Control:

Transformation efficiency is tested by using the pUC19 control DNA supplied with the kit and the high efficiency transformation protocol listed below. Transformation efficiency should be $\geq 3 \times 10^7$ CFU/ μg pUC19 DNA.

Untransformed cells are tested for appropriate antibiotic sensitivity.

General Guidelines:

Follow these guidelines when using DL39(DE3) chemically competent cells:

- Handle competent cells gently as they are highly sensitive to changes in temperature or mechanical lysis caused by pipetting.
- Thaw competent cells on ice and transform cells immediately following thawing. After adding DNA, mix by tapping the tube gently. Do not mix cells by pipetting or vortexing.

High Efficiency Transformation Protocol:

Use this procedure to transform DL39(DE3) chemically competent cells. We recommend verifying the transformation efficiency of the cells using the pUC19 control DNA supplied with the kit. Do not use these cells for electroporation.

- 1) Remove competent cells from the $-80\text{ }^{\circ}\text{C}$ freezer and thaw completely on wet ice (10-15 minutes).
- 2) Aliquot 1-5 μl (1 pg-100 ng) of DNA to the chilled microcentrifuge tubes on ice.
- 3) When the cells are thawed, add 50 μl of cells to each DNA tube on ice and mix gently by tapping 4-5 times. For the pUC19 control, add 1 μl of (10 pg/ μl) DNA to a chilled microcentrifuge tube, prior to adding 50 μl of cells. Mix well by tapping. Do not pipette up and down or vortex to mix, this can harm cells and decrease transformation efficiency.
- 4) Incubate the cells with DNA on ice for 30 minutes.
- 5) After 30 minute ice incubation, heat shock the cells at $42\text{ }^{\circ}\text{C}$ for 45 seconds.
- 6) Transfer the tubes to ice for 2 minutes.
- 7) Add 950 μl of Recovery Medium or any other medium of choice to each tube.
- 8) Incubate tubes at $37\text{ }^{\circ}\text{C}$ for 1 hour at 210 rpm.
- 9) Spread 50 μl to 200 μl from each transformation on pre-warmed selection plates. We recommend plating two different volumes to ensure that at least one plate will have well-spaced colonies. For the pUC19 control, plate 50 μl on an LB plate containing 100 $\mu\text{g}/\text{ml}$ ampicillin. Use sterilized spreader or autoclaved ColiRoller™ plating beads to spread evenly.
- 10) Incubate the plates overnight at $37\text{ }^{\circ}\text{C}$.

5 Minute Transformation Protocol:

The following procedure results in only ~10% of the transformation efficiency as the protocol listed above.

- 1) Remove competent cells from the -80 °C freezer and thaw in your hand.
- 2) Aliquot 1-5 µl (1 pg-100 ng) of DNA to the microcentrifuge tubes. Do not pipette up and down or vortex to mix, this can harm cells and decrease transformation efficiency.
- 3) Incubate the cells with DNA on ice for 2 minutes.
- 4) After 2 minute ice incubation, heat shock the cells at 42 °C for 45 seconds.
- 5) Transfer the tubes to ice for 2 minutes.
- 6) Add 950 µl of Recovery Medium at room temperature or any other medium of choice to each tube. Immediately spread 50 µl to 200 µl from each transformation on prewarmed selection plates. We recommend plating two different volumes to ensure that at least one plate will have well-spaced colonies. For the pUC19 control, plate 50 µl on an LB plate containing 100 µg/ml ampicillin. Use sterilized spreader or autoclaved ColiRoller™ plating beads to spread evenly.
- 7) Incubate the plates overnight at 37 °C.

Calculation of Transformation Efficiency:

Transformation Efficiency (TE) is defined as the number of colony forming units (cfu) produced by transforming 1µg of plasmid into a given volume of competent cells.

$$TE = \text{Colonies}/\mu\text{g}/\text{Dilution}$$

Transform 1 µl of (10 pg/µl) pUC19 control plasmid into 50 µl of cells, add 950 µl of Recovery Medium. Dilute 10 µl of this in 990 µl of Recovery Medium and plate 50 µl. Count the colonies on the plate the next day. If you count 100 colonies, the TE is calculated as follows:

$$\text{Colonies} = 100$$

$$\mu\text{g of DNA} = 0.00001$$

$$\text{Dilution} = 50/1000 \times 10/1000 = 0.0005$$

$$TE = 100/.00001/.0005 = 2.0 \times 10^{10}$$

Related Products:

- ig® 5-Alpha Chemically Competent Cells (Cat.# 1031-12)
- BL21(DE3) Electroporation Competent Cells (Cat.# 1212-12)
- T4 DNA Ligase (Cat.# 3212)
- i7® High Fidelity DNA Polymerase (Cat.# 3254)
- IG® Autoinduction Media. (Cat.#: 1722)
- IG® Autoinduction DE3 Electro Competent Cells (Cat.#: 1266)

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