



# IG® C43(DE3) Chemically Competent Cells

## Manual

<b>Catalog #</b>	<b>1047-06</b>	<b>1047-24</b>
<b>Package Size</b>	<b>6x50 µl</b>	<b>24x50 µl</b>



### 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 (IG®) C43(DE3) Chemically Competent Cells are optimized for transformation and routine recombinant protein expression from vectors driven by an IPTG-inducible T7 promoter.

C43(DE3) is a mutant derivative of BL21(DE3), further selected from C41(DE3) survivor cells that were able to overexpress the toxic subunit b of *E. coli* F-ATPase (Ecb). Compared to C41(DE3), C43(DE3) can express a distinct set of toxic proteins and carries additional mutations that help prevent cell death associated with the expression of many recombinant toxic proteins.

IG® C43(DE3) is an *E. coli* BL21(DE3) mutant strain particularly effective for expressing toxic proteins from a wide range of organisms, including viruses, bacteria, yeasts, plants, animals, and mammals. The performance of the C43(DE3) strain in toxic protein expression has been validated by a patent and supported by many publications.

## Specifications:

Competent cell type: Chemically competent

Species: *E. coli*

Strain: C43(DE3)

Format: Tubes. Custom format available

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

Blue/white screening: No

Shipping condition: Dry ice

## Reagents Needed for One Reaction

IG® C43(DE3) chemically competent cells: 50  $\mu$ l

DNA (or pUC19 Control DNA, 10 pg/ $\mu$ l): 1  $\mu$ l

Recovery medium: 1 ml

## Product Components and Recommended Storage Condition:

- IG® C43(DE3) Chemically Competent Cells: -80°C
- DNA (pUC19, 10 pg/ $\mu$ l): -20°C
- Recovery medium: 4°C

## Genomic Features:

IG<sup>®</sup> C43(DE3) Chemically Competent Cells have the following features:

- T7 Expression Strain
- Selected for expression of toxic proteins
- Suitable for expression of toxic genes

## 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  $\geq 3.0 \times 10^7$  CFU/ $\mu\text{g}$  pUC19 DNA.

Untransformed cells are tested for appropriate antibiotic sensitivity.

## General Guidelines:

Follow these guidelines when using IG C43(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.

## Calculation of Transformation Efficiency:

Transformation Efficiency (TE) is defined as the number of colony forming units (cfu) produced by transforming  $1\mu\text{g}$  of plasmid into a given volume of competent cells.

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

Transform  $1\mu\text{l}$  of ( $10\text{ pg}/\mu\text{l}$ ) pUC19 control plasmid into  $50\mu\text{l}$  of cells, add  $950\mu\text{l}$  of Recovery Medium. Dilute  $10\mu\text{l}$  of this in  $990\mu\text{l}$  of Recovery Medium and plate  $50\mu\text{l}$ .

Count the colonies on the plate the next day.

If you count 100 colonies, the TE is calculated as follows:

$$\text{Colonies} = 100$$

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

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

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

## High Efficiency Transformation Protocol:

Use this procedure to transform IG<sup>®</sup> C43(DE3) Chemically Competent Cells.



*These cells are designed for chemical transformation only. Do NOT use for electroporation. For electroporation transformation, use IG<sup>®</sup> C43(DE3) Electro Competent Cells.*

### 1. DNA/Cell Mixture Preparation

- 1.1. Remove competent cells from the  $-80^{\circ}\text{C}$  freezer and thaw completely on wet ice for 10–15 minutes. Ensure that Recovery Medium is readily available at room temperature.
- 1.2. Aliquot 1–5  $\mu\text{l}$  of DNA (1 pg–100 ng) into each pre-chilled microcentrifuge tube kept on ice. If using the pUC19 control, add 1  $\mu\text{l}$  of pUC19 DNA (10 pg/ $\mu\text{l}$ ) to a chilled microcentrifuge tube.
- 1.3. Once thawed, gently add 50  $\mu\text{l}$  of competent cells to each DNA tube while keeping on ice. Mix gently by tapping the tube 4–5 times. If using the 50  $\mu\text{l}$  package size competent cells, add DNA directly to the tube after the cells have thawed and mix gently by tapping.



*Do NOT pipette up and down or vortex. Harsh mixing can damage cells and reduce transformation efficiency.*

### 2. Chemical Transformation

- 2.1. Incubate the DNA/cell mixture on ice for 30 minutes.
- 2.2. Heat shock the cells by placing the culture tubes in a  $42^{\circ}\text{C}$  water bath for 45 seconds.
- 2.3. Immediately return the tubes back to ice for 2 minutes.

### 3. Cell Recovery

- 3.1. Aliquot 950  $\mu\text{l}$  of room-temperature Recovery Medium (or other suitable medium) into each culture tube (17 mm  $\times$  100 mm), then transfer the heat-shocked cell/DNA mixture into the corresponding tube.
- 3.2. Incubate the tubes in a shaking incubator at  $37^{\circ}\text{C}$  by shaking at 210 rpm for 1 hour.

### 4. Cell Plating

- 4.1. Plate 50–200  $\mu\text{l}$  of each transformation onto pre-warmed LB agar plates containing the appropriate antibiotic(s). For the pUC19 control, plate 50  $\mu\text{l}$  on an LB plate containing 100  $\mu\text{g}/\text{ml}$  ampicillin. Spread evenly using a sterile spreader or autoclaved ColiRoller<sup>™</sup> plating beads.  
*Before cell plating, the plates should be prewarmed to growth temperature ( $37^{\circ}\text{C}$ ), and be free of condensation to prevent contamination and mixed colonies.*  
*We recommend plating two different volumes to ensure well-isolated colonies on at least one plate.*
- 4.2. Incubate the plates overnight (12–16 hr) at  $37^{\circ}\text{C}$ .

## Five-Minute Transformation Protocol:

The following procedure yields ~10% of the transformation efficiency achieved with the high-efficiency transformation protocol.

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 room temperature Recovery Medium or any other medium of choice to each tube. Immediately 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 µg/ml ampicillin. Use sterilized spreader or autoclaved ColiRoller™ plating beads to spread evenly.
7. Incubate the plates overnight (12-16 hr) at 37 °C.

## References:

1. Walker JE & Miroux B. US6361966.
2. Miroux B, Walker JE. J Mol Biol. 1996 260:289-98.
3. Dumon-Seignovert L, Cariot G, Vuillard L. Protein Expr Purif. 2004 37:203-6.
4. Wagner S, et al. Proc Natl Acad Sci U S A. 2008. PMID: 18796603
5. Kwon et. al. Sci Rep. 2015 5:16076
6. Zhang et. al. Microb Cell Fact. 2015 14:142.
7. Bajzert et. al. BMC Vet Res. 2022 18(1):409.

## Related Products:

- IG BL21(DE3) Chemically Competent Cells (Cat.# 1051, 1051-06, 1051-96)
- IG C41(DE3) Chemically Competent Cells (Cat.# 1043)
- IG C41pLysS(DE3) Chemically Competent Cells (Cat.# 1045)
- IG C41(DE3) Electro Competent Cells (Cat.# 1243)
- IG C43pLysS(DE3) Chemically Competent Cells (Cat.# 1049)

## Ordering Information:

- Order online within the USA. Place orders on [www.intactgenomics.com](http://www.intactgenomics.com) using our secure Shopping Cart.
- Order by email, phone, or fax.  
Email: [sales@intactgenomics.com](mailto:sales@intactgenomics.com)  
Phone: (314) 942-3655 | Toll-free : 855-835-7172 | Fax: (314) 942-3656
- Order via our distributors.

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Our hours are Monday - Friday, 8 AM to 5 PM, U.S. central standard time (CST).

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